



**2022**  
**SICASH**

SLIIT INTERNATIONAL CONFERENCE ON  
ADVANCEMENTS IN SCIENCES & HUMANITIES

**THE PROCEEDINGS OF  
SLIIT INTERNATIONAL  
CONFERENCE ON ADVANCEMENTS IN  
SCIENCES & HUMANITIES**

**"CREATING INNOVATIVE  
SOLUTIONS THROUGH RESEARCH"**

11<sup>th</sup> October, 2022

ORGANIZED BY



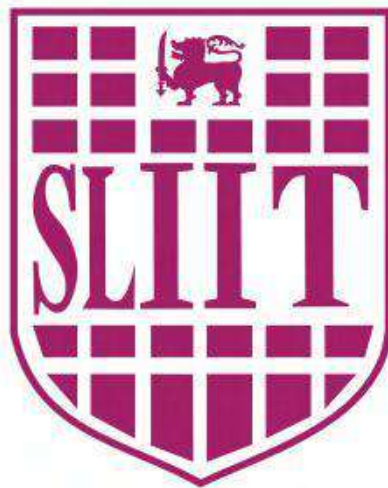
**FACULTY OF  
HUMANITIES & SCIENCES**

**PROCEEDINGS OF THE  
SLIIT INTERNATIONAL CONFERENCE ON ADVANCEMENTS  
IN SCIENCES AND HUMANITIES [SICASH]**

***“Creating Innovative Solutions  
Through Research”***

11<sup>th</sup> October, 2022  
Colombo, Sri Lanka

Organized by  
**Faculty of Humanities & Sciences (FHS)**



## **Disclaimer**

The views expressed in the papers published in these proceeding are those of the authors. The statements and opinions stated either in the papers published herein or at the conference and the discussions does not necessarily represent the views of the Faculty of Humanities and Sciences.

## **Proceedings of the SLIIT International Conference on Advancement in Sciences and Humanities**

A publication of the Faculty of Humanities and Sciences, SLIIT

ISSN 2783-8862

© 2022 by Faculty of Humanities and Sciences, SLIIT

## **SICASH 2021 Committee**

### **Conference Chairs**

General Chair

Dr. Malitha Wijesundara

Co-Chair

Dr. Virajith Gamage

Co-Chair

Dr. Nilanga Abeysinghe

### **Chief Advisor to the Conference**

Prof. Colin N. Peiris

### **Editors - in – Chief**

Prof. Thaiyamuthu Thanaraj

Dr. Manouri Jayasinghe

Ms. Nayomi Abayasekara

### **Associate Editor**

Ms. Ashani Peiris

## **Editorial Board**

- Ms. Upeksha Rathnasena
- Ms. Jayathri Kalinga
- Ms. Keshani Wijesuriya
- Ms. Navodya Rajapakse
- Ms. Randula Gunawardhana
- Ms. Sankaja Amaraweera
- Ms. Samurdhi R. Jayamaha

## **Organizing Committee**

- Prof. Sarath Peiris
- Dr. Charitha Jayaruk
- Dr. Kushanthi Harasgama
- Dr. Ruvini Mathangadeera
- Mr. Shanitha Mirihana
- Mr. Kushan Anthony
- Ms. Sankaja Amaraweera
- Ms. Himasha Gunathilaka
- Ms. Sucheru Disssanayaka

## **Track Leaders**

Education	Dr. Susil Perera
English Language & Literature	Ms. Nayomi Abeysekara
Law	Ms. Samurdhi Jayamaha
Mathematics & Statistics	Ms. Nilushi Dias
Natural Sciences	Dr. Jagath Kasturiarachchi
Nursing & Health Sciences	Ms. Chandrika Dasanayake
Psychology	Ms. Thilakshi Fernando

## Review Committees – SICASH 2022

### Education

Prof. T. Thanaraj	Sri Lanka Institute of Information Technology (SLIIT)
Dr. M.B. Ekanayake	SESIP, Ministry of Education
Dr. Godwin Kodithuwakku	IRD in Health & Social Caring
Dr. M.L.S. Piyathissa	Science Department, NIE, Maharagama
Dr. A.D.A. De Silva	Science Education Department, NIE, Maharagama
Dr. D. Keppetigoda	Research Department, NIE, Maharagama
Dr. S.M.L.P. Subasinghe	Technical Education Department, NIE
Dr. Virajith Gamage	Sri Lanka Institute of Information Technology (SLIIT)
Dr. K.G.S.K. Perera	Sri Lanka Institute of Information Technology (SLIIT)

### English Language & Literature

Dr Shashinie Thenabadu	University of Colombo
Dr. Waruni Tennakoon	Buddhist and Pali University of Sri Lanka
Dr. Prasangani K.S.N.	Sabaragamuwa University
Dr. S.G.S. Samaraweera	University of Ruhuna
Dr. Chandana Dissanayake	Sabaragamuwa University
Dr. Nipunika Dilani	Buddhist and Pali University of Sri Lanka
Dr Chandeeera Gunawardena	University of Kelaniya
Dr. M. G. Lalith Ananda	University of Sri Jayewardenepura
Dr. Ramani Jayasinghe	University of Kelaniya
Dr. Sulochana Neranjani	University of Colombo
Dr. Zareena Hussain	Visiting Academic
Dr. C.G. Shyamala	Mercy College, Palakkad
Mr. Prasanna Rathnayake	University of Moratuwa

### Law

Prof. Naganathan Selvakkumaran	Sri Lanka Institute of Information Technology (SLIIT)
Prof. Shanthi Segarajasingham	Senior Academic
Prof. Indira Nanayakkara	University of Colombo
Prof. Naazima Kamardeen	University of Colombo
Fr. (Dr.) Noel Dias Senior	Visiting Academic
Dr. J. M. Swaminathan	Senior Partner, Julius and Creasy
Dr. K. Kanag-Isvaran	President's Counsel
Dr. Asanga Gunawansa	Senior Legal Practitioner
Dr. Rose Wijesekara	University of Colombo
Dr. Udapadie Liyanage	University of Colombo
Dr. Dinesha Samararatne	University of Colombo
Dr. Kushanthi Harasgama	Sri Lanka Institute of Information Technology
Dr. Darshan Sumanadasa	University of Colombo
Dr. Chathura Warnasuriya	Asia Pacific Institute of Information Technology
Dr. Yasoda Wijerathna	Visiting Academic
Mr. Prasantha Lal de Alwis	President's Counsel

Mr. Dinal Philis  
 Ms. Subashini Siriwardena  
 Mr. Rajeev Amarasuriya  
 Ms. Shermila Anthony  
 Mr. Isuru Liyanage  
 Ms. Indira Ratwatte  
 Ms. Ashwini Natesan

President's Counsel  
 AAL Asst. Director General, Bribery Commission  
 AAL Senior Legal Practitioner  
 University of Colombo  
 University of Colombo  
 Gen. Sir John Kotelawala Defence University  
 Visiting Academic

## **Mathematics & Statistics**

Prof. Thomas Mathew  
 Prof. Mohamed Razmy  
 Prof. Sarath Peiris  
 Prof. Rupika Abeynayaka  
 Dr. Thilini Mahanama  
 Dr. M. K. Aberathna  
 Dr. N. C. Ganegoda  
 Dr. Mohamed Cassim Alibhutto  
 Dr. Neluka Devpura  
 Dr. Hasanthi Pathberiya  
 Dr. Thanuja Paragoda  
 Mrs. Yogeswary Raviraj  
 Ms. Dilushi Kodithuwakku

University of Maryland Baltimore Country, USA  
 South Eastern University of Sri Lanka  
 Sri Lanka Institute of Information Technology (SLIIT)  
 Wayamba University of Sri Lanka  
 University of Kelaniya  
 University of Ruhuna  
 University of Sri Jayewardenapura  
 South Eastern University of Sri Lanka  
 University of Sri Jayewardenapura  
 University of Sri Jayewardenapura  
 University of Sri Jayewardenapura  
 South Eastern University of Sri Lanka  
 University of Kelaniya

## **Natural Sciences**

Prof. Aruni Weerasinghe  
 Prof. Jagath Manatunge  
 Prof. Kapila Yakandawala  
 Dr. Wajira Balasooriya  
 Mr. Ranil Kularatne

Rajarata University  
 University of Moratuwa  
 Wayamba University  
 Wayamba University  
 Sri Lanka Institute of Biotechnology

## **Nursing & Health Sciences**

Prof.S.S.P.Warnakulasuriya  
 Dr. G. Kisokanth  
 Dr. K. G. P. Nirmani  
 Dr. Kalpani Abhayasinghe  
 Dr. M. R. S. Jayathilake  
 Dr. M.K.D.L Meegoda  
 Dr. I.M.P.S. Ilankoon  
 Dr. R. H. M. P. N. Rathnayake  
 Dr. S. M. T. D. Sundarapperuma  
 Dr. Sarath Rathnayake  
 Dr. S. M. K. S. Seneviratne  
 Dr. R.M.T.B. Abeyratne  
 Dr. Thusharika Dissanayake  
 Dr. B. S. S. De Silva

University of Colombo  
 University of Colombo  
 University of Ruhuna  
 General Sir John Kotelawala Defence University  
 University of Sri Jayewardenapura  
 University of Sri Jayewardenapura  
 University of Sri Jayewardenapura  
 University of Sri Jayewardenapura  
 University of Ruhuna  
 University of Peradeniya  
 University of Sri Jayewardenapura  
 University of Sri Jayewardenapura  
 University of Peradeniya  
 The Open University of Sri Lanka

Ms. W.S. M. S. S. Weerasekara  
Ms. S. P. R. Chandralatha  
Ms. Hiranga Wijedasa  
Ms. D. M. C. D. K. Dasanayake

Post Basic College of Nursing  
Post Basic College of Nursing  
Sri Lanka Institute of Information Technology(SLIIT)  
Sri Lanka Institute of Information Technology(SLIIT)

## **Psychology**

Dr. Sumedha Jayakody  
Dr. Nilanga Abeysinghe  
Ms. Sakuni Weerasinghe  
Ms. Omella Outschoorn  
Ms. Kushlani Munasinghe  
Ms. Diluxshy Sanjeevan  
Ms. Nisali Perera  
Mr. Lakmal Ponnampereuma  
Ms. Raneesha de Silva  
Ms. Iresha Donmanige  
Ms. Thirsha de Silva  
Mr. Naren D. Selvaratnam  
Ms. Leila Tennakoon  
Ms. Shalindi Pandithakoralage  
Ms. Thilakshi Fernando

Kandy Consulting Group (Pvt) Ltd.  
Sri Lanka Institute of Information Technology (SLIIT)  
Breathe Counselling Center  
University of Colombo (PhD)  
Child, Adolescent, and Family Services  
Psychology Programmes ANC Education  
Maastricht University, Netherlands (PG candidate)  
University of Peradeniya  
Forensic Psychologist/Free Yezidi Foundation, Iraq  
University of Wollongong (PhD)  
Open University of Sri Lanka  
Management and Science University, Malaysia (PhD)  
University of Colombo  
Clinical Psychologist/SLIIT  
Psychologist / SLIIT





### **Message from the Editors -in Chief**

We are pleased to announce the launch of the proceedings of 3<sup>rd</sup> successive SICASH in 2022 organized by the Faculty of Humanities and Sciences (FHS) at SLIIT. The conference theme of *Creating Innovative Solutions through Research* caters to a timely 'glocal' discussion on socio-economic and political disruptions that affect humankind at present. The research presented at the conference will provide insights on possible solutions to these prevailing issues, perceived through a variety of disciplinary lenses.

The seven disciplinary tracks: Natural Sciences, Education, English Language & Literature, Law, Nursing & Health Sciences, Mathematics & Statistics and Psychology; establish the very diversity of opinions that the conference intends to bring together. The Editorial Board strongly believes that such multiple perspectives will enrich the disciplines themselves while simultaneously providing rational solutions to the contemporary issues. The 67 papers from local and overseas scholars presented at the conference have been selected after rigorous screening through double blind peer reviewing by experts, thus ensuring their higher quality and relevance.

SICASH 2022 further emphasizes the commitment of FHS as a responsible academic entity to advance knowledge in the disciplines that it facilitates. While attending to its academic and social responsibility, SLIIT is also keen to assist researchers by creating a platform that nurtures and expands scholarship. Hence its staunch support for a research culture manifested through SICASH 2022.

The editors are grateful for the support given by the Chancellor, Vice Chancellor, Deputy Vice Chancellor of SLIIT in organizing the conference. The Dean of FHS deserves a special appreciation for his inspiration, leadership and assistance provided throughout the conference. The editorial board also thanks all the authors, reviewers, judges and chairpersons for their unwavering support to enrich the conference with their scholarly insights. All the FHS staff members are also herewith mentioned to acknowledge their constant support.

**Prof. T. Thanaraj, Dr. Manouri Jayasinghe & Ms. Nayomi Abayasekera**

Editors - in – Chief



### **Message from the Chancellor**

It is indeed a great pleasure to issue a congratulatory message as the Chairman / Chancellor of the Sri Lanka Institute of Information Technology familiarly known as SLIIT, on the third research conference 'SLIIT International Conference in Advancements on Sciences and Humanities' (SICASH 2022) presented by its youngest faculty, The Faculty of Humanities and Sciences (FHS).

This young faculty is multidisciplinary and has succeeded in hosting the 'SLIIT International Conference in Advancements on Sciences and Humanities' (SICASH) for three consecutive years. Indeed, this is an event to be proud of, as teaching philosophy of the FHS, is to focus on education where high priority is given to research. Hence, the theme of this year's conference is "Creating Innovative Solutions Through Research". I am confident that this theme will boost the quality of research and collaborations of SLIIT in the future.

Research plays a crucial role in the development of a country, and this being what Sri Lanka really needs at this moment. SICASH 2022 attracts national as well as international participants and will be beneficial in acquiring global knowledge and cooperation for the institute as well as the country.

My heartfelt felicitations go out to the Dean of the FHS, the organizing committee and to all those participants from far and near who made this conference possible. I wish good luck and all the success to the faculty and its staff for all your future endeavours.

**Prof. L. L. Ratnayake**

Chancellor



### **Message from the Vice-Chancellor**

I am pleased to send this congratulatory message to the Faculty of Humanities and Sciences of SLIIT as they host their third Annual Conference, 'SLIIT International Conference in Advancements on Sciences and Humanities' (SICASH) 2022.

The theme of this year's conference "Creating Innovative Solutions Through Research" is very apt as it is globally the crying need to overcome the crises the world is currently facing. Finding groundbreaking and cost-effective research in all fields possible being one of the pressing concerns in the contemporary world, SICASH 2022 provides an ideal platform for local and international researchers to present their new research findings.

The Faculty of Humanities and Sciences, the youngest faculty of SLIIT, offers many disciplines ranging from Biotechnology, Natural Sciences, Mathematical Studies, Nursing, Law and Education. Organizing a conference of a multidisciplinary nature is by no means an easy task, and it requires a great deal of hard work and commitment of our academic and non-academic staff.

I wish to commend the efforts of the Dean of the Faculty and the Organizing Committee who have striven hard to accomplish a successful SICASH 2022. The destiny of hard work is invariably a success, and our Faculty of Humanities and Sciences has proved this with their third SICASH conference. I am confident that they will take it to even greater heights during the annual conferences in the future.

**Prof. Lalith Gamage**  
Vice Chancellor



### **Message from the Deputy Vice Chancellor**

I am delighted to send a congratulatory message to SICASH 2022, which is appearing on the horizon for the third year in a row. 'SLIIT International Conference in Advancements on Sciences and Humanities' is the platform where international and national academics meet annually. It is organized by the Faculty of Humanities and Sciences (FHS) of the Sri Lanka Institute of Information Technology. FHS is multidisciplinary; its conference, which carries this feature, enables scholars of diverse disciplines to participate. This, indeed, is praiseworthy and adds to the prestige of the establishment and the faculty.

Being fully aware of all it takes to set up an international conference of this nature, I am very thankful to the Dean and the academic and the non-academic staff of FHS for their time and energy spent apart from that used for their daily work, to make SICASH happen. I sincerely thank the distinguished keynote speakers, reviewers, sponsors and participants who helped make SICASH 2022 a remarkable event.

I wholeheartedly wish the faculty to soar to greater heights in the future with every passing year.

**Prof. Nimal Rajapakse**  
Deputy Vice-Chancellor



### **Message from the General Chair**

Research is an integral part of a university. In order to promote research, staff and students should have a platform to showcase their research findings. SICASH provides that platform covering all seven disciplines offered by the faculty. Selected papers from the conference are also published in the SLIIT Journal of Humanities and Sciences.

All the papers in the conference are double blind reviewed by an eminent panel of reviewers to ensure that only high-quality papers are accepted for the conference. We have more than 55 local and international papers in the 3rd SICASH conference that we launched in 2020.

I would like to congratulate all the authors for getting their papers selected for presentation at the conference. I sincerely thank the co-chair and the staff of the faculty for working as a team to ensure the success of SICASH 2022.

**Dr. Malitha Wijesundara**

Dean/Faculty of Humanities & Sciences



### **Message from the Co-Chairs**

We are glad to send this message for the SLIIT International Conference on Advancements in Sciences and Humanities (SICASH) 2022. This year, we have researchers within and outside of Sri Lanka presenting their research findings in seven tracks. Our theme for this year is “Creating Innovative solutions through research.” We are glad to appreciate the many novice and experienced researchers who continued to engage in this task amidst one of the most difficult times in Sri Lankan history.

Reading through the papers, we can understand that they have not only sorted innovative solutions through research in their subject matter, but they have come up with innovative solutions on how to engage in research during the COVID pandemic and the financial crisis in the country. Thus, we take this opportunity to congratulate all the paper presenters and authors for presenting their research. We are also glad to reintroduce the student poster presentations as part of SICASH this year and commend the enthusiasm shared by the students to engage in research.

It is our duty and pleasure to thank the Dean and staff of the Faculty of Humanities and Sciences and all who contributed to making this event a success. This annual event would not be possible without your dedication and contribution. Also, thanks to all the SICASH participants for joining us, and we invite you to participate in the technical sessions actively and gain the best out of this academic experience.

**Dr. Virajith Gamage & Dr. Nilanga Abeysinghe**

Co – Chairs – SICASH 2022

## Contribution of the Keynote Speaker



### **Prof. Katherine B. Ensor**

President, American Statistical Association  
Noah G. Harding Professor of Statistics  
Director, Center for Computational Finance and Economic Systems  
Rice University  
Houston, TX, USA  
ensor@rice.edu

## Computational Finance: Correlation, Volatility, and Markets

Financial data, by nature, are interrelated and should be analyzed using multivariate methods. Many models exist for the joint analysis of multiple financial instruments. Early models often assumed constant behavior between the financial instruments over the analysis period. But today, time-varying covariance models are a key component of financial time series analysis leading to a deeper understanding of changing market conditions.

Specifically, modeling the daily volatility (variance or standard deviation) of a stock or asset return is an important step in estimating how much risk a particular asset carries. However, the variance is not directly observable from a time series since there is only one observation at each time point. The 1982 seminal paper of Nobel Laureate Robert Engle introduced the Autoregressive Conditional Heteroscedasticity (ARCH) model allowing analysts a path to obtain such an estimate. Over the last half-century, an explosion in strategies for modeling heteroscedasticity in time series, or the changing variance of the process, has been made. One overarching model is the generalization to the (G)ARCH model, which includes lagged components of squared innovations of the time series in the model.

Another key feature one wants to capture when modeling the volatility across financial markets is the correlation across and within asset classes. The multivariate Generalized Autoregressive Conditional Heteroscedasticity (MGARCH) model is used for studying the relationships between the volatilities and co-volatilities of multiple stocks. An excellent survey on MGARCH models (with over 1000 citations) is provided by Bauwens in 2006.

Challenges of MGARCH modeling include the fact that the covariance matrix must be positive definite at every time point, as well as the obvious curse of dimensionality leading to a large number of parameters for even simplistic model formulations. A very popular MGARCH model from the early era that solves these issues is the constant conditional correlation (CCC) model, which decomposes the conditional covariances of the stock returns into conditional correlations and conditional standard deviations. The basic premise of the CCC model is that the conditional correlation matrix between returns is constant over time, but the univariate conditional standard deviations change over time. This changing structure is captured using time series models for the conditional standard deviations.

Of further importance is the recognition that markets structurally change over time and that any model or system must adapt to this change. Dynamic conditional correlation (DCC) models adapt to market conditions. Variants of the DCC models have become one of the most popular financial time series methods in recent literature due to this need to capture changing market dynamics. In this talk, I highlight some of the new findings for the DCC class of MGARCH models.

Another strategy to adapt to changing market dynamics is through Markov switching models where model parameterizations change with market conditions. In the univariate setting, GARCH models with varying parameters, such as the regime-switching model improve volatility forecasting. Similar improvements are seen in regime-switching models for multivariate co-volatility where copulas are used to capture the multivariate dependence.

Finally, I bring forward a hierarchical regime-switching dynamic covariance model (HRSDC) with a general discussion of estimation and how this model can capture the between and within dynamic covariance structure for a large number of stock returns potentially representing an entire market. I will give an example of stock market returns through the late 90's and early 2000's, including the fall of the U.S.-based corporation ENRON leading to the 2001 global financial crisis. Further, structural change through the U.S. and global subprime crises of 2008 is also explored. We can foreshadow events such as the decline of the U.S. firm Lehmann Brothers with large lead times.

In summary, the primary motivation for this complex model characterization concerns stock portfolio diversification and early identification of stock market anomalies. The hierarchical regime-switching dynamic covariance time series model captures the changing co-movement of stocks within and between sectors as market conditions change due to market collapses and crashes or common external influences that drive economies.



## Plenary Speakers for Different Tracks

### Education



**Dr. Subhashinie Wijesundera**

Senior Lecturer  
Department of Education  
Faculty of Arts  
University of Peradeniya

**Title:** *“Education Research in the Quest for Improving Practice*

### English Language and Literature



**Dr. Romola Rassool**

Director  
Post Graduate Institute of English  
The Open University of Sri Lanka

**Title:** *“Beyond EAP and ESP: Academic Literacy as a Means of Supporting Students in English Medium Degree Programs”*

### Law



**Mr. Prasantha Lal De Alwis PC.**

President’s Counsel  
LLB (Hons) (Colombo)  
LLM (Colombo)

**Title:** *“Law: The Facilitator for Innovative Solutions through Research”*

## Mathematics and Statistics

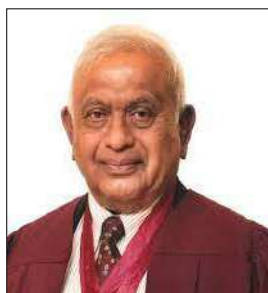


**Prof. S. Sanjeewa Nishantha Perera**

Head of the Department  
Research & Development Center for Mathematical Modelling  
Department of Mathematics University of Colombo  
Sri Lanka

**Title: *“Applications of Actuarial Models / Tools in Non-Insurance Domain”***

## Natural Sciences



**Prof. Upali Samarajeewa**

Emeritus Professor in Food Science & Technology  
University of Peradeniya

**Title: *“Polycyclic Aromatic Hydrocarbons and Food Safety”***

## Nursing and Health Sciences



**Dr. Sunil De Silva**

Dean  
Faculty of Health Sciences  
Open University of Sri Lanka

**Title: *“Evidence Based Practice in Health Care: From Theory to Reality”***

## Psychology



**Prof. Piyanjali de Zoysa**

Senior Professor  
Department of Psychiatry  
Faculty of Medicine,  
University of Colombo

**Title: *“Being a Humane Psychologist”***

**SICASH 2022 – PROGRAMME**  
**11<sup>th</sup> October 2022**

<b>Time</b>	<b>Event</b>
8.30 AM – 8.35 AM	Welcome, National Anthem & Lighting of the Oil lamp
8.35 AM – 8.40 AM	Welcome Address by General Chair, SICASH 2022 <b>Dr Malitha Wijesundara</b> Dean – Faculty of Humanities and Sciences
8.40 AM – 8.50 AM	Address by the Vice-Chancellor of SLIIT <b>Prof. Lalith Gamage</b>
8.55 AM – 9.05 AM	Address by Co-Chair, SICASH 2022 <b>Dr Nilanga Abeysinghe</b>
9.05 AM – 9.30 AM	Address by the Chief Guest - Introduced by Prof. Sriyani Peiris <b>Senior Prof. Udith K. Jayasinghe-Mudalige</b> Vice Chancellor – University of Wayamba
9.30 AM – 10.15 AM	Keynote Speech - Introduced by Prof. Sarath Peiris <b>Prof. Katherine B. Ensor</b> President, American Statistical Association (2022) Title: “Computational Finance: Correlation, Volatility and Market”
10:15 AM – 10.25 AM	Address by the Advisor, SICASH 2022 <b>Prof. Colin Peiris</b>
10:25 AM	End of Inauguration Ceremony
10:30 AM – 11:00 AM	Break
11.00 AM – 11:30 AM	<b>Sessions:</b> Plenary speech and discussion
11:30 AM – 3:00 PM	<b>Sessions:</b> Paper presentations
3:45 PM – 4:30 PM	Award ceremony Vote of thanks by Co-Chair, SICASH 2022 <b>Dr Virajith Gamage</b>

### SICASH 2022 - Education

<b>Paper ID</b>	<b>Title of the Paper</b>	<b>Name of the Author/s</b>	<b>Page Numbers</b>
43	Parental Determinant Factors for Managing Home Learning for Students	A.W.K.G. Wijesingha	1 - 5
70	A Study on Mindfulness Among the Prospective Teachers	M.S.Bhuvaneswari, A. Catherin Jayanthi	6 - 10
46	Modeling the ICT Teachers' Perspective Towards Teaching of Computer Programming at Secondary School Level	K.G.S.K. Perera	11 - 16
45	Recruitment and Retention of Secondary School Teachers: with Reference to International Schools in Colombo	F.S. Sharifdeen	17 - 21
71	Educational Technology Implications for Enhancing Reading Comprehension	S.Sunitha, A .Catherin Jayanthi	22 - 26

## SICASH 2022 – English Language and Literature

<b>Paper ID</b>	<b>Title of the Paper</b>	<b>Name of the Author/s</b>	<b>Page Numbers</b>
31	The Use of Audio and Audio-visual Materials for Teaching Process Descriptions and Identification of Errors: A Study with Tertiary Level Students	Wijesuriya, K.G., Dissanayake D.M.S.S.	28 - 33
25	An Analytical Study of the Factors Influencing the English Speaking Proficiency of English Medium Prospective Teachers	Uditha Srimathie Amaratunga	34 - 39
42	The Factors which Potentially Led to Victorian Duplexity	Manouri A Jayasinghe	40 - 45
58	To Leave or Not to Leave: Attitudes of the Undergraduates Towards Speaking in an Online ESL Classroom	Ashani Peiris	46 - 50
5	Online vs Face to Face: Perspective of Undergraduates on Learning English Literature During the Pandemic	Rajapakse R.W.D.N.K.	51 - 55
19	A Study of L2 Motivational Self System: A Comparison between First Year Students Following Engineering Local and Foreign Degrees in a Non-State Campus	Randhula Gunawardhana	56 - 60
15	English Speech Production of Native Sinhala Speakers with Special Reference to Inter-language Analysis	H. M. T. Wijayabandara	61 - 64
61	Austen, Cinderella complex and beyond: An analysis of Austen's Portrayal of her Heroines in Juxtaposition to the Cinderella Complex	Upeksha Rathnasena	65 - 69
56	Trajectory of Learning Academic Vocabulary: IT Undergraduates' Vocabulary Learning Strategies and Performance at the Exam	Jayathri Kalinga	70 - 76
14	Students' Positioning in the Classroom: A Case of Undergraduates Learning English as a Second Language in Sri Lanka	Ekanayake K.K.T.N., Dineeka P.A.C.	77 - 81
53	Shift in the Sri Lankan ESL Classroom – An Experiment with Mobile Assisted Language Learning	Sankaja Amaraweera	82 - 86
61-A	Envisioning Biocentrism in The Great Derangement: Climate Change and the Unthinkable	Dr. C.G.Shyamala	87 - 93

## SICASH 2022 – Law

<b>Paper ID</b>	<b>Title of the Paper</b>	<b>Name of the Author/s</b>	<b>Page Numbers</b>
26	Towards a Tailor-Made Legal Structure for Social Enterprises in Sri Lanka	K.M.M.M. Jayathilaka	95 - 101
4	UK Constitution: Should it be Codified	Chaga Bihari Mahingoda	102 - 111
50	Violation of Human Dignity through Online Harassment: A Case for stronger Protection of Privacy in Sri Lanka	Kushanthi Harasgama, Samurdhi Jayamaha	112 – 119
27	Intimate Partner Violence: A problem without a Proper Solution	Ishara Palatuwa	120 – 126
28	A Dialogue on the Effectiveness of Section 308A and Section 341 of the Penal Code in Discouraging Corporeal Punishments	Shiran Harsha Widanapathirana	127 – 133
52	Prosecuting Sexual Bribery in Sri Lanka: A Study on Sexual Bribery and ‘Consent’ of the Victim	Kamini Prabodha Rathnayake	134 – 139
20	Protection Status of Geographical Indications (GIs) of the Agricultural Sector in Sri Lanka Compared to Other Developing Countries in the World: Special Emphasis on Lessons to Learn from India and Vietnam	Uttara Kaumadi Wijesuriya	140 – 144
32	Forging Ahead with Attitudinal Changes Towards Efficient Commercial Arbitration in Sri Lanka	K.G.T Dilhara	145 - 149
36	Mediation and the Myth of Enforceability	W A Saranee Wasana Gunathilaka, Samurdhi Jayamaha	150 – 156
18	Promoting Sri Lanka as a Seat of International Arbitration: Lessons to be Learnt from International Jurisdictions	Makumburage Dona Chavindri Chiranga Perera	157 – 163
8	Right to Information Vs. Right to Protect Personal Data: A Guidance from the Decisions of the USA & the European Court of Justice	R.L.W. Rajapakse	164 – 169
57	A Fly in the Ointment: Undue Liability on E-Commerce Platforms	Krishanthi Darshika Rajaguru	170 – 174
17	The Legal Debate on the Commercial Use of Personal Data – A Discussion of the EU GDPR Precedent	Henaka Rallage Chiranthi Thavisha Senanayake	175 - 181

## SICASH 2022 – Mathematics and Statistics

<b>Paper ID</b>	<b>Title of the Paper</b>	<b>Name of the Author/s</b>	<b>Page Numbers</b>
7	Reference Ranges and Control Limits that are Resistant to Baseline Outliers	Dhammika Amaratunga	183 – 188
22	Convergence of Gradient Methods with Deterministic and Bounded Noise	Hansi Abeynanda, G. H. Jayantha Lanel	189 – 195
40	Exact Solution for the Upper Minimal Total Cost Bound of Multi-Supplier Single-Buyer Interval Transportation Problem	Jayani Gamage	196 – 200
74	Modeling Weekly Covid Data in Europe and Sri Lanka: Time Series Approach	J. A. Pubuduni A. Jayakody	201 – 206
16	Identifying Proteins Associated with Disease Severity	O. Samarawickrama, R. Jayatillake and D. Amaratunga	207 – 211
30	Factors Affecting Corona Deaths in Sri Lanka: Time Series Modeling Approach	W.A.D.R Wathsala and T . S. G. Peiris	212 - 219
37	Modeling and Forecasting the Weekly Incidence of Dengue in Colombo District of Sri Lanka	Arachchi, K. A. N. L. K. and T. S. G. Peiris	220 - 225

## SICASH 2022 – Natural Sciences

<b>Paper ID</b>	<b>Title of the Paper</b>	<b>Name of the Author/s</b>	<b>Page Numbers</b>
34	Current Status and Challenges in Using Plant-Food Waste in the Cosmetic Industry-a Case study in the Sri Lankan Context	M.A.P.K. Thilakarathne, W.D.C.C. Wijerathne.	227 - 233
54	In Vitro Antibacterial Activity of Sulphur Nanoparticles as a Possible Application to Control Bacterial Blight Caused by Xanthomonas spp. in Anthurium	Sriyani E. Peiris, Gayani Malwattage, Raveena D. Ratnayake, Kasun L. Seneviratne, Colin N. Peiris	234 - 240
51	Effects of Coconut Water on Micropropagation of Caladium Bicolour cv 'Thai Beauty'	Raveena D. Ratnayake, Sriyani E. Peiris, Gayani Malwattage, Colin N. Peiris	241 – 245
64	Commercialization of Dracaena Sanderiana (Lucky bamboo) as a Foliage Crop in Hambanthota District of Sri Lanka	H.I.G.K.Anuruddi, D.L.C.K. Fonseka	246 – 250
21	Urban Farming: A Review on Techniques Used in Urban Farming in Mayan Civilizations	Sadani Kulathunga, Thilini Perera, TGUP Perera, Chameera Udawattha	251 – 255
59	Social and Economic Effects of the Cultivation of Solanum Virginianum; A Case Study in Anamaduwa DS Division, Sri Lanka	Siriwardena, B. P, Vidanapathirana, N. P, Ketippearachchi, K. G, Rajasekara, L. R. W. D.M.	256 – 260
63	Abandonment of Paddy Lands and its Causal Factors in Bentota Pahalagamhaya Agrarian Service Division, Sri Lanka	A.H Hansika, S.T.C Amarasinghe, T.G.I Sandamal	261 - 265



## SICASH 2022 – Nursing and Health Sciences

<b>Paper ID</b>	<b>Title of the Paper</b>	<b>Name of the Author/s</b>	<b>Page Numbers</b>
81	Common Maternal and Neonatal Outcomes of Pregnancies Diagnosed with Endometriosis	Epaarachchi E. A. K., De Silva B. S. S.	267 – 274
47	Correlates of Severe Pain: Descriptive Study among Patients with Cancer in Sri Lanka	Edirisinghe, N. P, Makuloluwa, P.T.R. , Amarasekara, A. A.T.D., Goonewardena, C.S.E.	275 - 279
77	Satisfaction Level and Quality of Life of Patients Living with Split-Thicknes Skin Graft, Following a Burn Injury in Burns Unit of the National Hospital, Colombo, Sri Lanka	Rajaguru S. C., Gunawardana R. T.	280 – 284
80	Case Study on the Patient with Ovarian Cancer: Palliative Nursing Management	Alahakoon, N., Meegoda, L.	285 – 289
82	Psychosocial Impact of a Young Adult Undergone a Permanent Colostomy Caused by a Perineal Injury Following a Road Traffic Accident: A Case Report	Karunasingha U.D.A.D, Rajapaksha R.W.M.K.G.H.N, Dasanayake C.D.K.	290 – 294
83	Case Report: High-Pressure Chronic Retention (HPCR) of an Elderly Female; Ongoing Care Following Permanent Urinary Catheter	Wijayarathne G. H. P. D. S., Kumarasinghe M. S., Dasanayake C. D. K.	295 – 299
84	Care of an Adult Patient Underwent a Series of Surgical Interventions for Psoas Abscess Complicating with Haemophilia: Case Report	Sepalika H.M.S., Dasanayaka C.D.K., Dinuka M. D.	300 – 305
85	Necrotizing Fasciitis: Following Uncontrolled Blood Glucose Level: A Case Report	Siriwardhana S.W.P., Wanigasinghe W.A.A.S., Dasanayake C.D.K.	306 – 310
86	Knowledge and Attitudes Regarding Emergency Contraceptive Pills among SLIIT Undergraduates in Sri Lanka- Preliminary Findings of a Descriptive Cross-Sectional Study	Palanikumar S., Rathnayake R.M.A.P.M., Wijedasa H., Dassanayaka C. D. K., Anthony K., Guruge M.L., Edirisinghe N.P	311 - 316

## SICASH 2022 – Psychology

Paper ID	Title of the Paper	Name of the Author/s	Page Numbers
3	Impact of Health Beliefs on Covid-19 Related Preventative Health Behaviours and Coping Behaviours	W. A. Sakuni Weerasinghe, Sachini Akuretiya	318 – 322
13	An Exploratory Study on Work Stress and Job Satisfaction During the COVID-19 Pandemic in Hotel Sector Employees in Sri Lanka	Ebony M.A. Bradie- Miles, Donmanige Iresha Chamindi	323 – 331
39	Evaluation of ENhancing Assessment of Common Therapeutic factors – Sri Lanka (ENACT-SL) to Assess Common Factors in Counselling in Determining Therapist Competence in Sri Lanka	Nilanga Abeysinghe, Brandon Kohrt, Ananda Galappatti	332 – 338
65	Siblings of Children with Autism Spectrum Disorder: Behavioural and Emotional adjustment and the Influence of Family Factors on Adjustment.	Mahamalage Janisha Thilakshi Fernando	339 – 346
41	Attitude of Police officers towards Dealing with Individuals with Psychological Problems: A Sample from selected Police Stations in Colombo District	Leila Tennakoon, Lakmal Ponnamperuma	347 – 353
9	Perception of people with mental disorders about their mental health condition: An exploratory study	Ven. Koonkandawala Wimaladhamma	354 – 361
48	Online Socializing and Offline Alcohol Usage: Influence of Daily Social Media Usage on the Level of Alcohol Usage among Students at a Non-state University in Sri Lanka	Sakuni Kanjana Galappaththi, Nilanga Abeysinghe	362 – 367
66	The effects of Text Difficulty on Type of Miscues Among Proficient, Average & Below Average Readers	Vanessa Therese Van Gramberg, Dilhara Vithanage	368 – 372
67	Perceived stress level and associated factors among Allied Health Science undergraduates in University of Sri Jayewardenepura	Hiranga Wijedasa	373 – 378
24	Depression, Anxiety, and Stress in Primary Caregivers of Children with Invisible Disabilities in Sri Lanka	Waahidah Mohamed, Raneesha De Silva	379 - 383

# Education



## Study on the factors that influence parental attitude and involvement in children's home learning: An exploratory study

A.W.K.G. Wijesingha<sup>\*1</sup>, L.H.D.L.Ranasuriya<sup>2</sup>

### ARTICLE INFO

#### Article History:

Received Date: 01 July 2022

Accepted Date: 15 September 2022

#### Keywords:

Covid-19, Home learning, Online, Parents, Determinant factors

#### Citation:

A.W.K.G. Wijesingha, L.H.D.L.Ranasuriya. (2022). *Study on the factors that influence parental attitude and involvement in children's home learning: An exploratory study*. Proceedings of SLIIT International Conference on Advancements in Sciences and Humanities, (11) October, Colombo, 1 - 5.

### ABSTRACT

Due to the sudden closure of schools during the Covid-19 pandemic, parents were required to promote home learning in order to support their children's online learning. As a result, the quality of online learning activities provided to primary school students is dependent on parental participation. Thus, this research focuses on studying the extent to which parental factors influence the management of home learning for students. The study adopted a descriptive research design and used a purposive sampling technique to select the respondents. The data was collected using a self-administered questionnaire and semi-structured interviews were distributed among the sample of students ( $n = 30$ ) and parents ( $n = 20$ ) whose children are studying in primary classes at a school in the district of Rathnapura, Sri Lanka. In the questionnaires, participants were asked to rate how much they agreed with the statements on a five-point Likert scale, ranging from 'strongly disagree' to 'strongly agree'. The quantitative data was statistically analyzed using charts and graphs, while the qualitative data was analyzed using content analysis. This study found that parents' awareness, education level, and socioeconomic background have a significant impact on children's home learning. The findings suggest that seminars, training programs, and workshops for parents would help enhance the knowledge and skills related to home learning.

\*Wijesingha, awkasuni@gmail.com

## INTRODUCTION

The COVID-19 crisis has forced many children to miss school, thereby causing many to be far behind their learning pace. Thus, more and more schools are looking to adopt distant learning solutions in order to help these students get back on track with their studies (Champeaux et al., 2022). This situation challenged the education system and forced educators to shift to an online mode of teaching. Thus, many school children were assigned to deliver their education through online learning. Learning during the pandemic occurred through the use of online learning tools and applications. Distance learning media such as Zoom, Google Classroom, Google Meet, and WhatsApp were optimally utilized for conducting learning in the classroom (Fendi et al., 2021). It was therefore a serious burden to their parents since they had to put much effort into providing their children with the facilities, they needed in order for them to learn online at home (Champeaux et al., 2022). In recent years, more and more parents have been choosing to allow their children to use online learning applications. However, there are still some who are hesitant about this. (Picca et al., 2021) Emphasized that in online learning early detection of emotional distress was important in both in children and parents and plan interdisciplinary-based support interventions. During the Covid-19 pandemic, students in Sri Lanka were not very technologically confident and required considerable technological support. They were not used to the e-learning culture or distance learning (Anderson, 2008). It was therefore observed that the quality of online learning activities offered to primary school pupils depends on parental engagement. Even though this led to a decrease in parental engagement, which impacted the quality of online learning activities (Anderson, 2008). As a result of this phenomenon, the question arose regarding how parental factors influenced children's home learning during this period. Hence, this study collects both students' and parents' opinions on the influences, because it was equally significant to consider comparing similarities and differences in judgment.

1. To find out what influences' parents' attitudes towards online learning.
2. To find out what difficulties parents face in reinforcing students towards online learning.

3. To find out what suggestions are determined by parents to increase the effectiveness of online learning.

## MATERIALS AND METHODS

Within the framework of a descriptive survey research design, mixed method research approach was used in this study. Students and parents of children who study at primary schools in Sri Lanka comprised the population of this study. The target population of this study is students and parents whose children are in primary schools in the Rathnapura district. Students and parents who are in primary classes at primary schools in the Rathnapura district were selected as an accessible population for this study. The study of Brown recommended that 40–60 participants be adequate, with far fewer perhaps actually needed (as cited in Ha, 2014). Accordingly, a sample of students ( $n = 30$ ) and parents ( $n = 20$ ) whose children are studying in primary classes at the school in the research area, Sri Lanka, was selected using the purposive sampling technique. Both qualitative (semi-structured interviews) and quantitative (questionnaires) methods were employed to analyze the collected data. The questionnaire was developed based on a 5-point Likert scale. The quantitative data were analyzed statistically using charts, graphs, and data tables. The qualitative data sets were analyzed using content analysis. As the strength of the data was more focused on qualitative data analysis, the quantitative data was not examined in depth.

## RESULTS AND DISCUSSION

Questionnaire responses were grouped into three main categories. The first category corresponded to the first objective. The first objective was to find out what influences' parents' attitudes toward online learning. The questionnaire resulted in the following findings:

Table 01. Questionnaire results

Objective	Statement of the questionnaire	Responses					Attitude	
		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Positive	Negative
01.What influences parents' attitude towards online learning	I want to acquaint my children with technology devices.	15	22	20	30	13	✓	
	Children's learning engagement in online learning is high.	16	12	40	20	12	✓	
	I engage my children in online learning activities because that helps to manage my work and time efficiently.	25	20	25	18	12		✓
	Attention received by my child is comparatively high compared to the school context.	20	32	30	8	10		✓
	I can take the necessary action to eliminate my child's learning difficulties.	35	15	20	10	20		✓
	Time duration allocated for students' online learning is satisfied.	20	30	35	10	05		✓
	I prefer to engage my children in virtual classrooms more than in physical classrooms.	40	20	20	12	08		✓
	Online learning is much more effective as it covers the whole syllabus in less time.	20	22	50	4	4		✓
	I am more confident when dealing with technology and have more experience regarding the internet.	30	10	45	8	7		✓

Involving children in online learning and exposing them to technology devices contributed to positive attitudes toward their parents among the children and vice versa among the parents. The following statements give reasons to support negative attitudes: I engage my children in online learning activities to manage my work and time efficiently; the attention that my child receives is comparatively high compared to the school setting; I am able to take the necessary actions to eliminate my child's learning difficulties; I prefer to engage my children in virtual classrooms than physical classrooms; Online learning is much more effective since it covers the syllabus in a shorter period of time; I am more comfortable dealing with technology, and I am more confident when dealing with the internet. During the interview session, the researcher observed different attitudes of the interviewees. Parents were excited about the use of technology in their children's education. They said that it would be great if their kids got used to the technology from a young age because, in their time, they did not have much technology. Some students also showed an interest in using this new learning method, saying that there are beautiful pictures and videos available and they love them. One Interviewee concluded by saying that "I like to engage my children in online learning because there is no need to worry about child protection, transportation costs, and other costs associated with tuition." (Parents 15) Another said, "I can encourage my children to learn from different teachers, and I can choose which teachers are appropriate for them concerning their level of understanding and interest." (Parents 10). But some parents feel differently. They think that online learning is less effective than regular classroom learning

because it doesn't provide the same kind of social interaction. They also don't feel as if they can give their children as much attention as they would like because they work long hours at their jobs. One parent said, "It's so sad to see my children miss beautiful days in school with teachers and other children." (Parents 2). Empirical evidence from (Maksum et al., 2022) stressed that parents' negative perceptions of online learning during the pandemic were primarily due to the inconsistent schedule of online learning. This study found that both parents and students viewed online learning as an unpleasant learning activity during the pandemic, particularly during the early stages of the lockdown.

According to the results shown in the table 02 below, the second objective was to find out the difficulties parents face in guiding students toward online learning.

In response to the statements provided, responses were categorized as positive or negative. It appears that parents in this scenario are aware of and dealing with such difficulties positively.

Internet safety is a concern for parents when their children are online. The process of learning online cannot be monitored properly because parents lack time. Financial constraints limit the ability to provide online facilities and technological facilities. Online learning is made difficult by power outages and poor internet connections, Low technology makes it difficult for children to engage in online learning, the unfamiliarity with ICT devices, lack of ICT resources, poor quality of internet, the affordability of mobile data plans and the use of ICT devices and the internet without the presence of parents is a high risk. Lack of familiarity with technical problems, poor internet connections at home.

Table 02. Difficulties parents face in guiding students toward online learning

Objective	Statement of the questionnaire	Responses					Perception	
		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Positive	Negative
2.To find out what difficulties parents face in reinforcing students' towards online learning.	As a parent, I have to monitor whole online learning process most of the time.	10	15	25	20	30	✓	
	Financial strain limits the ability to provide online facilities and technological facilities for children to work in a home learning environment.	09	08	30	28	25	✓	
	My child showed an irregular working habits and less motivation to engage in online learning.	20	30	35	05	10		✓
	It is difficult at times to get my children to actively participate in online learning without punishment.	35	15	28	20	02		✓
	Online learning is made difficult by power outages and poor internet connections.	03	02	35	28	32	✓	
	Low technology makes it difficult for children to engage in online learning	18	07	30	25	20	✓	
	I'm not familiar with ICT devices .	18	03	29	20	30	✓	
	I can't afford and give my children proper ICT resources to use in online learning.	08	22	20	40	10	✓	
	Quality of internet connectivity is very poor while students' doing online learning.	15	05	20	35	25	✓	
	The affordability of mobile data plans is not affordable.	05	12	15	38	30	✓	
	The workload is high with homework and the rules are high, as example, when submitting home work when learning online involving children.	07	03	35	15	40	✓	
	Time allocation is somewhat difficult in many time.	10	20	30	35	05	✓	
	Use of ICT devices and internet without presence of parents are high in risk.	10	05	30	35	20	✓	
	I am not familiar enough with technical issues, applications .	02	03	40	30	25	✓	
	Lack of a suitable home learning environment for my children to study.	20	35	25	10	10		✓
	Poor internet connectivity at home.	07	10	35	38	10	✓	

The fact that parents struggle with these issues is evident from all of these responses. Although research from Ludji and Marpaung (2021) has also revealed that most parents have difficulty accessing online learning as they do not have supporting facilities such as smartphones, computers, and internet connections. Even if they do have these facilities, they are not familiar with using the devices. These factors have become common ones during online learning which include limited tech experience, lack of motivation, personal cognitions, challenging material, inadequate support, lack of community involvement, and learner boredom (Ludji & Marpaung, 2021). The interviewees were asked about their experiences with home learning. The following difficulties emerged, and it should be taken into account that the socio-economic background of the interviewees influences their experience: "I'm going to my friend's house. It's quite a distance away" (Student 5). Teachers give us instructions and guidelines, but there are many students who don't have devices, others who are waiting for their parents to come back, and many are struggling financially" (Parent 10). Sometimes I can't give my mobile for my kids' work because I have many things to do and sometimes it is urgent" (Parents 5). "I have three children in school, but we don't have any more devices, so when my elder one goes online, other kids can't

go" (Parents 3). However, some felt that this only works for certain students, saying: "I can do it online and let my children do it, but there are many parents who left school early and without having proper earnings so they cannot afford to buy books or pay for tutors; even teachers do help but I feel those students are so poor, they're very clever at learning." (Parent 10). In a study published by (Akinsanya et al., 2020), it was found that the socioeconomic status of parents significantly influences children's safety and protection. Low-income families were found to be less likely to reinforce safety concepts at home, and they also provided less protection for their children online.

## CONCLUSION

The most important issue that came up in the interviews in this study was the idea of collaboration between parents, teachers, and students. The need for collaboration on online meetings and awareness programs among parents with the support of teachers was clear. Other than that, parental monitoring devices for ICT devices were also brought up as a key issue. Parents expressed their desire for more free online learning opportunities for their children. This finding is important because it shows that the demand for programs like these are high, but there's a lack of supply. These

findings suggest that because of poverty, parents are not able to purchase devices for their children to attend online learning sessions at home. A few ideas were also drawn up as to how to make online learning at home more convenient for parents and students. These findings suggest that because of poverty, parents are not able to purchase devices for their children to attend online learning at home. It is also clear that parents' lack of knowledge and awareness related to the utilization of technological devices and online educational applications has become a major issue. The results from this study suggest that limited interaction between parents, teachers, and students will reduce the flow of the online class.

## REFERENCES

- Akinsanya O. O., Olaniyi O. S., & Oshinyadi P. O. (2020). Exploring parental responses to social and safety needs of school-age children during COVID-19 pandemic in ogun state, nigeria. *Journal of Human Behavior in the Social Environment*, 31(1–4), 27–42.
- Annika Andersson. (2008). Seven major challenges for e-learning in developing countries: Case study eBIT, Sri Lanka. *International Journal of Education and Development Using Information and Communication Technology (IJEDICT)*, 4(3), 45–62.
- Champeaux H., Mangiavacchi L., Marchetta F., & Piccoli L. (2022). Learning at home: Distance learning solutions and child development during the COVID-19 lockdown. *SSRN Electronic Journal*.
- Fendi H., Hanafi I., Ayu Monia F., Sudarman Aries Taufiq, M., & Eka Putri, R. (2021). Online-Based Academic Supervision during the Covid-19 Pandemic. *Journal of Physics: Conference Series*, 1779(1), 012027.
- Ha, E. H. (2014). Attitudes toward Video-Assisted Debriefing after simulation in undergraduate nursing students: An application of Q methodology. *Nurse Education Today*, 34(6), 978–984.
- Ludji I., & Marpaung T. (2021). Parents' Perception on the Implementation of Home Learning during Covid-19. *Jurnal Basicedu*, 5(5), 3636–3643.
- Maksum A., Wahyuni E. N., Aziz R., Hadi S., & Susanto D. (2022). Parents' and children's paradoxical perceptions of online learning during the covid-19 pandemic. *Advances in Mobile Learning Educational Research*, 2(2), 321–332.
- Picca M., Manzoni P., Milani G. P., Mantovani S., Cravidi C., Mariani D., Mezzopane A., Marinello R., Bove C., Ferri P., Macchi M., & Agostoni C. (2021). Distance learning, technological devices, lifestyle and behavior of children and their family during the COVID-19 lockdown in Lombardy: a survey. *Italian Journal of Pediatrics*, 47(1).





## A Study on Mindfulness among the Prospective Teachers

M.S.Bhuvaneswari<sup>1\*</sup>, A. Catherin Jayanthi<sup>2</sup>

<sup>1\*</sup>Department of Education, Alagappa University, Karaikudi, India

<sup>2</sup>Department of Education, Alagappa University, Karaikudi, India

### ARTICLE INFO

#### Article History:

Received Date: 01 July 2022

Accepted Date: 15 September 2022

#### Keywords:

Health, Teachers, Mindfulness, and Prospective Teachers

#### Citation:

S.Bhuvaneswari, A. Catherin Jayanthi. (2022). *A Study on Mindfulness among the Prospective Teachers*. Proceedings of SLIIT International Conference on Advancements in Sciences and Humanities, (11) October, Colombo, 6 - 10.

### ABSTRACT

Mindfulness is an emotional well-being, relative freedom from anxiety and disabling symptoms, and a capacity to establish constructive relations and cope with ordinary demands and stress of life. Mental hygiene is to save man from complexes and inner conflicts and to prepare him for such a living in which his natural diseases and social beliefs are properly adjusted and he may develop the capacity of facing complex situations as well. Mental sickness and for their convenience, the science of Mindfulness and facilities for psychology and treatment have been developed. There is no significant difference between Prospective teachers Male and Female in their Mindfulness, with reference to the dimensions of Realistic perception, Autonomy, and Environmental mastery.

### INTRODUCTION

Mindfulness is maintained and transmitted by nutrition and reproduction. The social aspect of human life is maintained and transmitted by education. The newborn infant is a helpless human being. But as he grows older, he is influenced by the formal and informal agencies of education. The prospective teacher develops his physical, mental, and emotional self, and social feelings also develop in him gradually. Education gives the child immense benefits. It brings up the child as the parents do. It guides them in life as an affectionate father and serves them faithfully like a wife. A well-educated person is known all over the region. Education

\*S.Bhuvaneswari, bhuvan.ms75@gmail.com

cultures the individual and helps him in his needs all over the world. Thus, education develops the individual like a flower that distributes its fragrance all over the environment.

## **MINDFULNESS**

Mindfulness is a state of mind characterized by emotional well-being, relative freedom from anxiety and disabling symptoms, and a capacity to establish constructive relations and cope with ordinary demands and stress of life. Mindfulness is a term used to describe how well the individual is adjusted to the demands and opportunities in life. A mentally healthy person is in harmony with himself and harmony and consequently with those around him. In other words, it is said to be a mind or personality functioning effectively in emotional disturbances. People able to meet his problem without many disturbances, and his fears and anxieties are normal. The conscious and the unconscious aspects of his mind are in tune with each other. Despite his problems and difficulties, he agrees with the rhythm of life. On the whole, we can say that the well-adjusted individual has integrated his basic needs with the demands of social living and has high tolerance without being seriously disorganized. His problem poses a challenge to him, they do weaken his resolve.

For the Development of personality, Mindfulness is as necessary as physical health. A physically healthy person may be incapable in all respects due to his mental sickness, so in the present complex development of human civilization, Mindfulness is as important as physical health. Some centuries ago, the problem of a study of Mindfulness was not so acute, Generally, then there were fewer wants and problems than what there are today, and people in the past required more physical labor than mental. Gradually, with the progress of civilization, a man surrounded by various domestic, social, national, and contemporary problems. They move towards mental sickness and for their convenience, the science of Mindfulness and facilities for psychology and treatment have been developed.

## **IMPORTANCE OF MINDFULNESS**

The main purpose of mental hygiene is to save man from complexes and inner conflicts and to prepare him for such a living in which his natural diseases and social beliefs are properly adjusted and he may develop the capacity of

facing complex situations as well. So, this provision is particularly valuable in the direction of personality development.

Teachers for internal and external adjustment from the development to protect them from mental complications, complexes that hinder personality development, to remove their mental defects, to satisfy or to direct natural desires of children towards desirable channels instead of repressing them, are some important functions of mental hygiene.

## **STATEMENT OF THE PROBLEM**

“A STUDY ON MINDFULNESS AMONG THE PROSPECTIVE TEACHERS”.

## **SAMPLE FOR THE STUDY**

The sample consists of 300 Prospective Teachers from 9 Colleges. Among them 118 are males and 182 are females.

## **OBJECTIVES OF THE STUDY**

1.To find the level of Mindfulness of Prospective Teachers.

## **NULL HYPOTHESIS**

1. There is no significant difference between Male and Female Prospective Teachers in their Mindfulness.

2. There is no significant difference between Rural and Urban Prospective Teachers in their Mindfulness.

## **TOOLS USED FOR THE PRESENT STUDY**

For the present investigation, the investigator used the Mindfulness inventory a standardized tool developed by the investigator.

## **ESTABLISHING VALIDITY AND RELIABILITY**

The investigator has collected a number of statements regarding mindfulness and consulted experts in the field. From the reactions of the experts the statements were found to be suitable for Mindfulness. Hence content validity was established. Reliability is the degree of accuracy and consistency. The investigator in consultation with his guide prepared a questionnaire consisting of 50 questions for Mindfulness. Each item in

Mindfulness Questionnaire can be answered by the respondents with Always, Sometimes, and Never.

## POPULATION

The population of this study consists of Prospective Teachers in Tamil Nadu.

## SAMPLE

A small proportion of a population, selected for observation and analysis is known as a sample. The method of sampling is based on the nature of the problem, size of the universe; availability of finance, item, and personnel. The investigator used a random sampling technique for selecting the sample from the population. The stratification has been done based on sex, standard, type of the school, and nature of the school.

## HYPOTHESIS TESTING

### NULL HYPOTHESIS 1:

There is no significant difference between Male and Female Prospective Teachers in their Mindfulness.

Table 01. Difference between Male and Female Prospective Teachers in Their Mindfulness

Dimension	Male(N = 118)		Female (N = 182)		Calculated "t" value	Remarks
	Mean	Standard Deviation	Mean	Standard Deviation		
Self-evaluation	22.82	3.04	23.60	3.18	2.12	S
Realistic perception	24.89	2.44	24.65	2.55	0.80	NS
Integration of Personality	24.62	2.83	26.42	3.30	5.05	S
Autonomy	16.23	1.93	15.92	2.09	1.30	NS
Group-oriented activity	15.50	1.82	15.90	1.58	1.96	S
Environmental mastery	13.58	2.71	13.52	2.52	0.22	NS

(At 5% level of significance table value of t is 1.96)

From the above table 01 it is inferred that there is a significant difference between Prospective teachers Male and female in their Mindfulness, with reference to the dimensions of Self-evaluation, Integration of personality and Group oriented activity.

From the above table 01 it is inferred that there is no significant difference between Prospective teachers Male and Female in their Mindfulness, with reference to the dimensions of Realistic perception, Autonomy, and Environmental mastery.

### NULL HYPOTHESIS 2:

There is no significant difference between Rural and Urban native Prospective Teachers in their Mindfulness.

From the below table 02 it is inferred that there is a significant difference between Rural and Urban native Prospective Teachers in their Mindfulness, with reference to the dimension of Autonomy.

From the below table 02 it is inferred that there is no significant difference between Rural and Urban native Prospective Teachers in their Mindfulness, with reference to the dimensions of Self-evaluation, Realistic perception, Integration of personality, Autonomy, Group-oriented activity, and Environmental mastery.

Dimension	Urban (N=9)		Rural (N=291)		Calculated “t” value	Remarks
	Mean	Standard Deviation	Mean	Standard Deviation		
Self-evaluation	22.89	2.67	23.31	3.16	0.46	NS
Realistic perception	24.89	3.52	24.74	2.47	0.12	NS
Integration of Personality	25.33	2.35	25.73	3.27	0.49	NS
Autonomy	16.89	1.27	16.02	2.05	1.98	S
Group-oriented activity	14.89	2.37	15.77	1.66	1.11	NS
Environmental mastery	13.67	2.78	13.54	2.59	0.14	NS

Table 02. Difference between Rural and Urban Native Prospective Teachers in Their Mindfulness

## RESULTS AND FINDINGS

From the above table.1 it is inferred that there is a significant difference between Prospective teachers Male and female in their Mindfulness, with reference to the dimensions of Self-evaluation, Integration of personality and Group oriented activity.

From the above table.1 it is inferred that there is no significant difference between Prospective teachers Male and Female in their Mindfulness, with reference to the dimensions of Realistic perception, Autonomy, and Environmental mastery.

From the above table 02 it is inferred that there is a significant difference between Rural and Urban native Prospective Teachers in their Mindfulness, with reference to the dimension of Autonomy.

From the above table.2 it is inferred that there is no significant difference between Rural and Urban native Prospective Teachers in their Mindfulness, with reference to the dimensions of Self-evaluation, Realistic perception, Integration of personality, Autonomy, Group-oriented activity, and Environmental mastery.

## CONCLUSION

Mindfulness happens when individuals simply pay attention to their day-to-day experiences in life. Especially for prospective teachers, attention and awareness are necessary characteristics. Mindfulness helps to train the attention to the present moment without burying themselves in their future. Though the findings of the study indicate that Prospective teachers differ in their mindfulness-based on Gender and type of Institution, research has shown that mindfulness can be taught effectively to individuals by trained professionals.

## REFERENCES

- Abujaradeh H., Colaianne B. A., Roeser R. W., Tsukayama E., & Galla B. M. (2020). Evaluating a short-form Five Facet Mindfulness Questionnaire in adolescents: Evidence for a four-factor structure and invariance by time, age, and gender. *International Journal of Behavioral Development*, 44(1), 20-30.
- Baer R. A., Smith G. T., Hopkins J., Krietemeyer J., & Toney L. (2006). Five Facet Mindfulness Questionnaire. *Assessment*, 13(1), 27-45.

- Germer C., Siegel R., & Fulton P. (Eds.) (2005). *Mindfulness and psychotherapy*. New York: Guilford Press.
- Hue M. T., & Lau N. S. (2015). Promoting well-being and preventing burnout in teacher education: A pilot study of a mindfulness-based programme for pre-service teachers in Hong Kong. *Teacher Development*, 19(3), 381-401.
- Hwang Y. S., Bartlett B., Greben M., & Hand K. (2017). A systematic review of mindfulness interventions for in-service teachers: A tool to enhance teacher wellbeing and performance.
- Imtiaz F., Ji L. J., & Vaughan-Johnston T. (2018). Exploring the influence of a low-dose mindfulness induction on performance and persistence in a challenging cognitive task. *Journal of Theoretical Social Psychology*, 2(4), 107-118.
- Kabat-Zinn J. (2003). Mindfulness-based interventions in context: Past, present, and future. *Clinical Psychology: Science and Practice*, 10, 144–156.



## Modeling the ICT Teachers' Perspective on Teaching of Computer Programming at Secondary School Level

K.G.S.K. Perera<sup>1\*</sup>

### ARTICLE INFO

#### Article History:

Received Date: 01 July 2022

Accepted Date: 15 September 2022

#### Keywords:

Interactive Qualitative Analysis, Teachers' Perspective on Computer Programming, Programming Curriculum

#### Citation:

K.G.S.K. Perera. (2022). *Modeling the ICT Teachers' Perspective on Teaching of Computer Programming at Secondary School Level*. Proceedings of SLIIT International Conference on Advancements in Sciences and Humanities, (11) October, Colombo, 11 - 16.

### ABSTRACT

Computer programming is viewed and experienced as a subject cognitively challenging to students as well as teachers. The aim of this study was to determine the ICT teachers' perspective on teaching computer programming in order to comprehend how ICT teachers perceive teaching computer programming and the factors that influence their work. Forty-seven ICT teachers participated in this qualitative study. The research method used was an analytical framework known as Interactive Qualitative Analysis to model the ICT teachers' perspective. The perspective was modelled in terms of factors (affinities) as programming curriculum, ICT resources, time, programming language, evaluation, students' performance, teachers' programming knowledge, teachers' pedagogical programming knowledge, student and professional development programs. Further, the interaction among these affinities was also modelled.

\*K.G.S.K. Perera, [Susil.p@sliit.lk](mailto:Susil.p@sliit.lk)

## INTRODUCTION

The introduction of ICT as a subject to the Sri Lankan school system at the General Certificate of Education (Ordinary Level) (GCE (O/L)) took place in 2007. Approximately 47% of the total time allocation for ICT curriculum is dedicated to learning computer programming (National Institute of Education, 2008). A national-level examination is conducted by the Department of

Examination of the Ministry of Education (MoE) for GCE (O/L) and it is only a written examination without any practical evaluation as far as the ICT curriculum is concerned.

Reports of the Controlling Chief of the ICT question paper of GCE (O/L) identified programming questions as the least preferred among the candidates and poor performance of the candidates in answering such questions (<https://www.doenets.lk/evaluationreports>). Further, outputs of in-service teacher training programs conducted for G.C.E (O/L) have indicated that the majority of ICT teachers who teach students of GCE(OL) are less comfortable with computer programming (Perera, 2015).

Computer programming is defined as instructing a computer to do a predetermined task which is usually a solution to a computable problem. A computer program should consist of an unambiguous set of instructions for the computer to follow (Saeli, 2011). Selection of a suitable programming language for teaching programming is also an issue (Chiu, 2014). Computer programming languages which are meant for professionals are not suitable for novices as they are confused by certain complex symbolic representations of the syntax of the language (NG, 2012). Students also perceive programming as an uncomfortable experience and tend to grow negative attitudes (Korkmaz, 2014). Although students' IQ and mathematical skills seem to have a bearing on learning programming, how gender or nationality is significantly related is not supported in literature (Ala-Mutka, 2004). Poor instructional methods and overlooking of students' different learning styles lead to unsuccessful learning (Korkmaz, 2014). However, even teachers have found that teaching programming is a difficult task (Yang et.al., 2015). Nevertheless, studies have not been carried out to find the reasons for such difficulties.

## INTERACTIVE QUALITATIVE ANALYSIS (NORTHCUT & MCCOY, 2004)

Interactive Qualitative Analysis (IQA) is a systems approach to qualitative research developed by Northcutt and McCoy of The University of Texas at Austin in 2004. IQA provides a framework to engage participants as a focus group and as individual interviewees to ground rich contextual data of the issue under study. One prominent advantage, among other things, of the IQA method is minimizing the researcher's direct involvement and the subjectivity in interpretation of data. (LasserreCortez, 2006). The method involves generating data through two phases – conducting a focus group session with participants and semi-structured individual interviews of participants.

In the first phase, in silent brainstorming, the participants write down, on cards provided, their perceptions (thoughts, feelings, reflections and experiences) of the issue being studied. Then these perceptions (data) are grouped and regrouped by the participants until further grouping is not logical. Each final group is labelled according to the nature of data and tilted as affinities. "Affinity is a set of textual references that have an underlying meaning or theme" (Northcut & McCoy, 2004, p 44). Each affinity is provided with a description. This process is called inductive coding. This process is referred to as axial coding in IQA. The next step is referred to as theoretical coding in IQA in which pair-wise influences (relationships) of one affinity on another, if such influence exists, were determined. In this process, each participant is asked to identify influence pairs of affinities (affinity 1 influences affinity 2 etc...) and document them with reasons for each influence. Number of times each pair of influence is stated by the participants is used to create a frequency table. This table is the basis for the analysis of data (Table 1).

Cumulative percent (relation) =  $\frac{1}{\text{number of possible influence pairs (p)}} \times 100 \times \text{number of cumulative relationships (cp)}$

Where  $p = NPr$ : where  $N$  = number of affinities,  $r = 2$  and  $cp = 1, 2, 3$  etc. up to  $p$

Cumulative Percent (Frequency) =  $\frac{\text{frequency for a relationship/cumulative frequency for all relationships}}{\text{number of relationships}} \times 100$

Power (Power is an index of the degree of optimization of the system) for a given relationship = Cumulative Percent(frequency)-

Cumulative Percent(relation) (Northcut & McCoy, 2004, p 159). IQA applies the MinMax criterion in deciding which relationships should be included in the group Inter Relationship Diagram among affinities (IRD) . MinMax is a statistics decision rule used in game theory to minimize loss in the face of a maximum loss

scenario. In IQA, it is used to determine the minimum number of relationships needed to be analyzed, which accounts for the maximum variation in the system (Northcut & McCoy, 2004). Cut-off point of the Frequency Table (Table 1) is determined when the Power reaches the maximum as per MinMax criterion.

Table 1: Affinities pairs in descending order of frequency with Power analysis

No.	Affinity Pair Relationship	Frequency (sorted in descending order)	Cumulative frequency	Cumulative Percent (Relation)	Cumulative Percent (Frequency)	Power

Interactive qualitative analysis adopts the Pareto principle (named after Economist Vilfredo Pareto who developed the concept in the context of the distribution of income and wealth among the Italian population) to statistically determine which of the inter-relationships should be included in the IRD. The Pareto principle or 80/20 rule observes that 20% of the variables in a system will account for 80% of the total variation in outcomes in the system (Northcut & McCoy, 2004). The relationship pairs at and above this point are considered to construct a concept map like relationship diagram among affinities which is called Cluttered System Influence Diagram (Cluttered SID). Before constructing Cluttered SID, if any ambiguous pairs are found in the selected set of affinity pairs, only the pair that is received highest votes from participants is retained. Ambiguous pairs are those received votes for both directions of relationship (1 $\rightarrow$ 2 and 2 $\rightarrow$ 1). This diagram is optimized to arrive at uncluttered SID by removal of redundant relationships among affinities. Redundant link is defined as “a link between two affinities in which, even if removed, a path from the driver (start affinity) to the outcome (end affinity) can be achieved through an intermediary affinity/ties. Redundant links can be thought of as the “paths of least resistance”. (Northcutt and McCoy, 2004, p.178).

This uncluttered SID is used as a basis for preparing the script for individual interviews in order to get an insight into the issue under study.

## OBJECTIVES OF THE STUDY

In view of the above explanation, objectives of the study are:

- Identifying the contributing factors (affinities) towards the perceptions of the ICT teachers in teaching computer programming.
- Developing a model to represent the perspective of ICT teachers towards teaching computer programming at GCE(O/L).

## METHODOLOGY

### Research Design

To study the perspectives of the teachers towards the teaching of programming at G.C.E. (O/L), a qualitative approach was made. The perspectives were studied employing IQA which is based on the systems approach. According to the IQA framework, the perspectives are formed in terms of affinities towards the integration of ICT in the classroom.

### Sample and Instruments

The characteristics of the participants were determined according to the guidance in IQA. In IQA terminology, participants are called the focus group. It is defined as a “ Group of individuals who may certainly have varied opinions and experiences with the system under study but who more critically share a common perspective.” (Northcut and McCoy, 2004:p47). In this case the sample was 47 ICT teachers purposively drawn from the government schools of Western (20), Southern (15) and North-Western (12) provinces. This sample size is sufficient for studies using IQA (Northcut & McCoy, 2004). The selection was to represent high, moderate, and less privileged schools in the school system (Chandrakumara, 2015).



In the IQA framework, two instruments were used. One was guidance for initial brainstorming on the expected 47 participants and the other was the Interview Protocol which was the main instrument. Interview Protocol was utilized to interview participants. The content of the Interview Protocol could not be predetermined as it would be based on the affinities (categories of data) generated in the first stage of data collection process which explained under the procedure (Northcut & McCoy, 2004).

### The method of collection and analysis of data using IQA

First the participants, taken as one group were briefed on the purpose of the study and the method of data collection. As the first step, participants were asked to silently brainstorm about their perception of teaching programming at GCE (O/L). Then they were asked to write one idea each on the cards provided. Next, the cards were displayed on a whiteboard and the ideas were grouped according to themes, by the researcher with the help of the participants. Emerged groups were regrouped, and regrouping was continued until it was satisfied that further grouping was not necessary. Each affinity was provided with a description by the participants.

In the next step, each participant was asked to identify influence pairs of affinities and document them with reasons for each influence. Frequencies (how many participants have mentioned a particular relationship between two affinities) were calculated and tabulated in the descending order of frequency. Then the Table 2 was constructed as per the directions in IQA.

After the removal of redundant links, uncluttered SID was constructed as illustrated by the Figure 3. This diagram was used to conduct individual interviews with participants on the affinities and their relationships in order to collect qualitative data on the participants' perspective on teaching programming. Out of 47 participants only 35 were available for interviewing. Interview data was used for further clarification of affinities and relationship among them.

### RESULTS AND ANALYSIS OF DATA

In fact, in this study Power was maximum at 72% and it was used as the cut-off point as it is

closer to 80%. (Table 2). As a result, 43 relationships were considered for the construction of cluttered SID (Fig. 2) and it was further revised by the removal of ambiguous pairs (eg. 1 - 4 and 4 - 1).

Altogether 47 participants from Western, Southern and North-Western provinces participated in this study. The participants produced 122 ideas. Ten affinities were identified as (1)Programming Curriculum, (2)ICT Resources, (3)Time, (4)Programming Language, (5)Evaluation, (6)Performance, (7)Teachers' Programming Skill, (8)Teachers' Pedagogical Knowledge on Programming, (9)Student and (10)Teacher Training. Table 2 illustrates the calculation of Power and cut-off point to consider the relevant relationships. (eg.1→4 means Programming Curriculum influences Programming Language (to be selected for the curriculum).

Table 2: Affinities pairs in descending order of frequency with Power analysis

No.	Affinity Pair Relationship	Frequency Sorted (Descending)	Cumulative Frequency	Cumulative Percent (Relation)	Cumulative Percent (Frequency)	Power
1	1→2	47	47	1.1111	1.8359	0.7248
2	1→3	47	94	2.2222	3.6719	1.4497
3	1→4	47	141	3.3333	5.5078	2.1745
Rest is here						
42	7→10	35	1815	46.667	70.898	24.2318
43	4→1	29	1844	47.778	72.031	24.2535
44	6→8	22	1866	48.889	72.891	24.0017
Rest is here						
90	10→1	10	2560	100	100	0

The cut-off point taken from the entire data set of Table 2 was at 43rd relationship where the power has reached its peak. It can be observed that the first 43 relationships out of 90 i.e. number of permutations or  $10P_2$  (47% of the total) account for 72% of the total variation (to be significant to construct cluttered SID). In fact, in this study Power was maximum at 72% and it was used as the cut-off point as it is closer to 80% (Pareto statistics).

The cluttered SID (Fig 1)was refined by removing redundant links to arrive at uncluttered SID (Fig. 2).

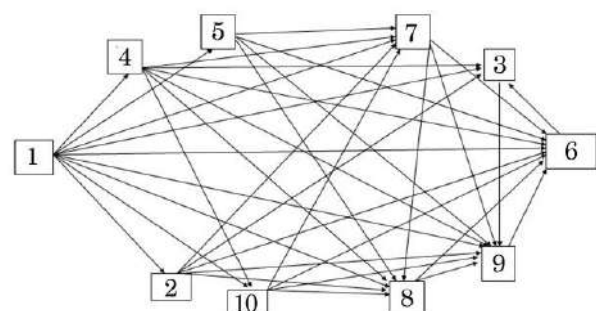


Fig 1: Cluttered Systems Influence Diagram

The dotted line (Fig.2) indicates a feedback loop i.e. Student can influence Teacher's Pedagogical Knowledge through Teacher's ICT Knowledge. In this study it was revealed

through interviews that if a student displays ICT knowledge which was not taught by the teacher, teacher tends to improve herself on ICT knowledge.

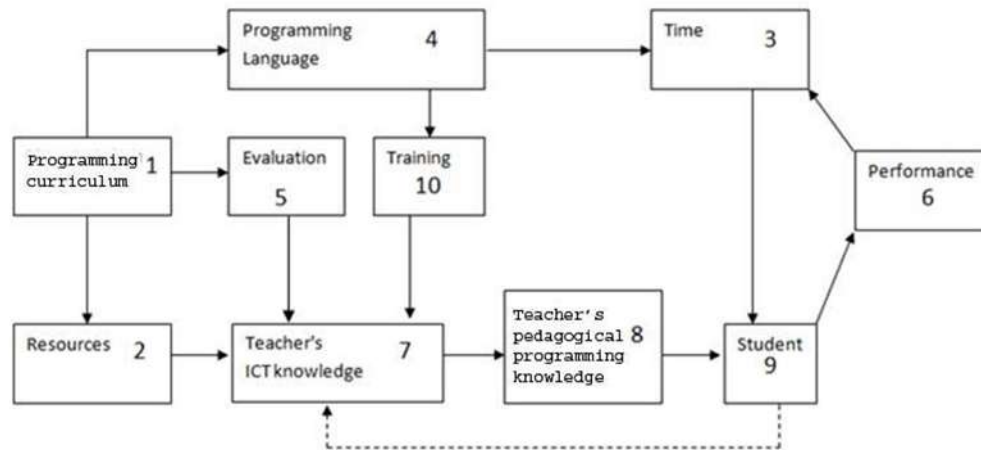


Fig 2: Uncluttered Systems Influence Diagram

## CONCLUSIONS AND SUGGESTIONS

The uncluttered SID is the model to represent the perspective of teachers on teaching of computer programming at secondary school level in terms of affinities identified. More details about the affinities and interaction among them are further discussed.

In order to make teachers more effective in teaching, the significant affinities necessary are teachers' programming knowledge and their pedagogical programming knowledge. Pedagogical knowledge is only influenced by the programming knowledge which in turn is directly influenced by questions set in the ICT question paper of the GCE (O/L) examination, ICT resources available to them in ICT laboratories and professional development programs for teachers. Teachers are compelled to update their programming knowledge by taking the feedback from students' programming knowledge which they display in the classroom and might have been acquired via alternative means like the Internet. Two directly influencing factors on students are time and teachers' pedagogical programming knowledge. Complexity of programming language prescribed by the curriculum demands more time to cover the programming content and on the other hand, poor performance of the students at GCE (O/L) drives teachers to allocate more time for teaching

programming. In this scenario teachers have viewed that students are directly responsible for their performance and remaining affinities are only indirectly responsible for their success. The circular relationship of students' performance → time → students when coupled with findings in group and individual interviews with participants indicates that the poor performance of students, demand increases in instructional time which in turn is helpful for the students.

Teachers are not happy about the ICT resources available for teaching programming. They commented "Number of computers are not enough for practical sessions and as a result more than 2 students have to share a computer". They think time allocated for programming section is not sufficient as evident from "There are too many topics in the syllabus to cover and time allocation is not enough to teach algorithms and do practicals". They also believe that prescribed programming language is not suitable. They commented "Students tend to play with objects in the IDE consequently it obliterates logical reasoning needed for programming". Teachers are of the opinion that students display poor performance in programming at GCE (O/L) and it is considered that students are reluctant to learn programming. Teachers were neutral about the programming questions in GCE (O/L) ICT question paper, teachers' pedagogical

programming knowledge and professional development programs. The only aspect they were positive about is their own programming knowledge.

Teachers believe that programming curriculum influences all the other affinities. ICT resources required, allocation of time, type of programming language, programming questions of ICT question paper and students' learning curve are determined by the programming curriculum. It also dictates teachers' pedagogical practice and the nature of professional development programs. ICT resources facilitate teachers' pedagogical practice and students' performance. Selection of computer languages should not levy unnecessary overhead on both teachers' practice and students' performance. This is supported by the comment "Students should get a simple IDE where they can type codes and test them easily". How programming knowledge is evaluated could be an eye-opener for teachers to update and upgrade their programming and its pedagogical knowledge as evident from "In the exam what is tested is not coding but logic behind the solution to problems. Usually in the exam, problem solving is not tested but fill-in the blanks of a program is expected.". Teachers complain that poor performance of students at GCE (O/L) examination compel them to conduct after-school classes to gain more time for teaching. They have not underestimated the significance of professional development programs since such programs provide the opportunity for teachers to gain both programming and pedagogical programming knowledge that could eventually ensure a successful instructional process in the classroom. They complain that "Enough in-service training is not provided on how to teach programming".

It is suggested that teachers should undergo comprehensive professional development programs that address programming knowledge and relevant pedagogical knowledge. One teacher complained that "Sometimes I feel embarrassed when certain students bring problems for which I cannot write programs easily". The ICT curriculum must be reviewed to reconsider the programming language being used at present. Student centered pedagogy must be encouraged, and students should be involved in solving more programming problems.

## REFERENCES

- Ala-Mutka K. (2004). Problems in learning and teaching programming-A literature study for developing visualizations in the Codewitz-Minerva Project. Codewitz Needs Analysis, 1-13.
- Chandrakumara D.P.S. (2015). Regional Imbalances in the Distribution of Educational Resources in Sri Lanka. *International Journal of Applied Research*, 13-21.
- Chiu C. (2014). Teaching Programming Concepts to K-12 Teachers With Scratch. *Journalism and Mass Communication*, 4,2, 125-132.
- Korkmaz Ö. (2014). A validity and reliability study of the Attitude Scale of Computer Programming Learning (ASCOPL). *MEVLANA International Journal of Education (MIJE)*, Vol. 4(1), 30-43.
- Lasserre-Cortez S. (2006). A Day in the Parc: An Interactive Qualitative Analysis of School Climate and Teacher Effectiveness through Professional Action Research Collaborative. (Unpublished Ph.D. Dissertation). The Department of Educational Leadership Research and Counseling. Graduate Faculty of the Louisiana State University and Agricultural and Mechanical College
- National Institute of Education (2008). Information and Communication Technology Syllabus: Grade11. Maharagama, Sri Lanka.
- NG, W. (2012). The Impact of Peer Assessment and Feedback Strategy in Learning Computer Programming in Higher Education. *Issues in Informing Science and Information Technology*. 9, 1-27
- Northcutt N., & McCoy D. (2004). *Interactive Qualitative Analysis: A Systems Method for Qualitative Research*. California: Sage Publications.
- Perera K.G.S.K. (2015). Status of Programming Skills of ICT teachers of G.C.E. (O/L) Unpublished manuscript.
- Saeli M., Perrenet J., Wim M.G., Jochems W.M.G and Zwaneveld B. (2011). Teaching Programming in Secondary School: A Pedagogical Content Knowledge Perspective. *Informatics in Education*, 10, 1, 73-88



## Recruitment and Retention of Secondary School Teachers: with Reference to International Schools in Colombo

F.S. Sharifdeen<sup>1\*</sup>

### ARTICLE INFO

#### Article History:

Received Date: 01 July 2022

Accepted Date: 15 September 2022

#### Keywords:

International schools; teacher recruitment; retention; turnover

#### Citation:

F.S. Sharifdeen. (2022). *Recruitment and retention of secondary school teachers: with reference to international schools in Colombo*. Proceedings of SLIIT International Conference on Advancements in Sciences and Humanities, (11) October, Colombo, 17 - 21.

### ABSTRACT

Teacher recruitment procedures are vital in being one of the significant factors in providing effective and quality teachers. However, limited research has delved into how teachers are recruited in international schools. Hence, this study attempts to investigate the factors considered in teacher recruitment procedures and how teachers can be retained in international schools, especially in the secondary section which is from year 10 to 13. A quantitative research approach was used. The study involved 72 teachers who were selected from six leading international schools in Colombo using the purposive sampling technique. This included Head of departments and senior teachers from the Science, Commerce, Arts, and Technology streams. From each school, 12 teachers were selected, representing three teachers from each stream. A survey research design was executed, and a questionnaire was administered to collect the data. Descriptive statistics such as frequency counts, percentages, and mean were used to analyze data. The findings of the study showed that since the expectations are so high, many of the applicants are not eligible to teach in these schools. Therefore, there is a shortage of qualified teachers in all streams. The findings also revealed that the teacher turnover rate is very high in the Arts and the Technology streams. Hence, a system change is required. The management should rethink the teacher recruitment and retention protocols by managing human resources more effectively.

\*Sharifdeen, sumaiyashariffdeen@gmail.com

## INTRODUCTION

Teacher recruitment and retention have been discussed as a national problem by different authors in different countries. According to See et al. (2020), teacher recruitment is the process of employing professionals to the teaching profession while teacher retention is the rate of teachers who remain in the profession after a specific period of time (Clarke, 2022). It is a global consideration to retain employees in any organization and the existing research has proved the effectiveness of employee retention to an organization in several measures such as organizational productivity and performance. However, a school environment is different from a profit-targeted company, and retention of teachers still remains as crucial concerning its importance in affecting the development of the learners.

The importance of teacher recruitment and retention relies on its influence on quality education. A school is responsible for providing quality education to the learners and supporting their development effectively. A teacher plays a crucial role in facilitating learners with an effective learning environment. This implies the significance of having qualified and trained teachers in schools. Further, the teachers should be knowledgeable enough to follow the respective curriculum of the school. This also signifies the importance of examining the qualifications of the teachers adequately in the recruitment process. Another important factor is that it takes a considerable time for the learners to be comfortable with a teacher. The interaction or the relationship between the teacher and the students is a crucial factor in education. When the teachers resign from their roles quickly, it directly affects the learners. Therefore, teacher retention is a significant factor that contributes to the performance of the school. Thus, this study will benefit the school management, teachers, parents, and students. Recruiting and retaining good teachers should be one of the most important priorities for any school in a country. Hence, this study will be an eye-opener for the school management and relevant authorities.

## LITERATURE REVIEW

In Sri Lanka, the criteria for teacher recruitment and the steps taken towards

ensuring teacher retention are doubtful. There are no standard criteria for international schools to recruit teachers. Therefore, it occurs at different levels in different schools. This has caused to define the quality of the education provided by these schools. The Job Embeddedness theory proposed by Lee & Mitchell (2011) explains that when the employees of an organization are bound socially and professionally to a specific working culture, there is less tendency for them to leave the job. The theory explains some factors including relationships they have with colleagues, relatives, and friends, individual factors such as personal interests, skills, and knowledge, organizational factors such as job requirements and organizational culture, and other factors such as entertainment and activities. This theory can be utilized to enhance the organizational factors related to the above and consider those factors in the recruitment process as well. The process of teacher recruitment and retention in international schools of Sri Lanka is different from that of government schools. In government schools, teacher recruitment is done according to a systematic procedure where the teachers are selected through interviews and selection tests. After that, they are given three years of practical training. Further, it is also compulsory for them to work in a rural school for five years before being recruited to a school of preference (Nishanthi & Suraweera, 2020). This procedure mostly ensures the qualifications of the teachers and also the compulsory working period encourages them to remain in the profession even with the difficulties.

In contrast to the recruitment procedure mentioned above, the majority of the international schools in Sri Lanka recruit teachers based on some light-weighted factors. Although a few reputed and well-established international schools recruit teachers according to a systematic procedure, the majority of the international schools do not consider much about the requirement process. (Balasooriya, 2013). This has caused a lot of problems in the school environment and also it has made the retention of the teachers in the profession quite uncertain. According to Odland and Ruzicka (2009), administrative leadership, compensation, and personal circumstances have been identified as the major factors affecting higher turnover rates of international school teachers. This study further suggests

that the recruitment process has also affected the above situation. Further, Balasooriya (2013) explains the significance of taking required measures such as providing monetary and non-monetary benefits for the teachers to encourage them to retain in the profession. Starting in the early 1980s, international schools have no regulation or control by the Ministry of Education as it comes under the Board of Investment (BOI). Due to this, the standard of education varies greatly between schools. According to Gunasekara (2019), these schools are not confined to the expatriate community, anyone with the ability and willingness to pay high tuition fees can join these schools. They follow the British curriculum such as the Cambridge or Edexcel. Most top International Schools, recruit well-qualified teachers with experience. Teachers should possess subject-specific knowledge as well as English language skills to enter these teaching jobs as the medium of instruction is English. Hence, this study aims to investigate the factors considered in teacher recruitment procedures and how teachers can be retained in international schools. In reaching that aim, the following research questions were drawn to guide this study.

1. What factors are being considered in recruiting teachers to international schools?
2. What are the reasons for a high teacher turnover in international schools?
3. What kind of teacher retention strategies can be implemented in these schools?

## MATERIALS AND METHODS

The study was conducted based on a survey research design. This is the most fundamental tool for all quantitative research studies, which provides a numeric description of a fraction of a population. The target population in this research was 300 teachers from six leading international schools in Colombo. Seventy-two teachers were selected as the sample. From each school 12 teachers were selected, representing three teachers each from the Science, Commerce, Arts, and Technology streams. These teachers were Head of Departments (HoDs) and senior teachers. They were selected based on the purposive sampling technique. This is because they are directly involved in recruiting new teachers before it is finalized by the school management. A self-developed questionnaire titled “Recruitment

and retention of secondary school teachers in International schools Questionnaire” was used to get the desired information from these teachers. The questionnaire was divided into two sections. (A and B). Section A was for the collection of information on the personal data of respondents, while section B consisted of questions that elicited responses from the respondents related to the research objectives. The questionnaires were personally administered by the researcher to the HoDs and senior teachers. Data were analyzed by using descriptive statistics such as mean, frequency counts, and percentage.

## RESULTS AND DISCUSSION

The findings first and foremost revealed that all six international schools recruit qualified teachers to their relevant streams. However, there is a shortage of qualified teachers, especially in the Arts stream. According to 55% of the participants, some teachers have studied the subject as a minor for their degree but they have not specialized it. Therefore, HoDs are left with no choice but to search for applicants with a general degree. Apart from academic qualifications, there are other factors that are considered in recruiting new teachers. Seven traits were ranked ordered by the participants, which is shown in figure 1. The three main traits which were considered by 80% of the participants were subject knowledge, pedagogical competencies, and fluency in English. Good communication skills are very important to international school teachers. Even if you are highly qualified, it will be quite challenging to survive in these schools if the teachers are not proficient in the English language.

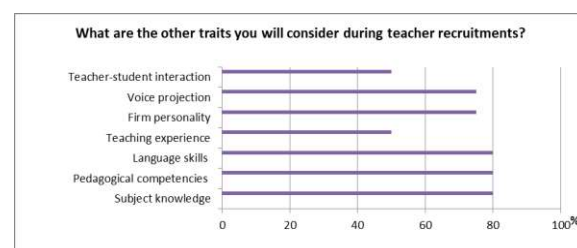


Figure 01. What are the other traits you will consider during teacher recruitments?

Local students come from an elite background and communicate mostly in English. 20% - 30% of the student population in these schools comprises of different

nationalities such as Korean, Chinese, Pakistanis, Indians, Middle Eastern, and European. Therefore, teachers must be able to converse very well in English, so that all students can understand the lesson. Firm personality and voice projection is the fourth and fifth trait which has received 75%. Due to the high school fee paid by the parents, strict disciplinary measures cannot be implemented at these schools. Therefore, being firm in the classroom is one method to manage discipline. However, due to the above factors being considered during the interview and lesson demonstration, recruiting new teachers becomes a challenging task. According to the survey, teacher turnover was very high in the Arts stream, which was 44%. Technology stream, which represents ICT and Computer Science, has a 28% turnover rate while the Science and Commerce streams had a 14% turnover rate.

workload is also important. 30 % of the HoDs feel that management should be more flexible and supportive towards the teachers. Instead of interfering, they must appreciate and have faith in the teachers to carry out their duties appropriately. 28% of the respondents believe that teachers could be retained if more induction and mentoring programmes were conducted. According to 25 % of the HoDs, there are very less professional development programmes for teachers in international schools. Also, higher studies are not encouraged due to the leave factor. Teachers find it difficult to do their post-graduate diplomas or master's degree while in school due to this reason. Teachers are highly discouraged to take leave in these schools. These factors demotivate teachers. Therefore, teachers can be retained if there is more empathy, support, and encouragement rendered towards them.

Table 01. Reasons for teacher turnover

Reason	Responses
Salary issues	30
Lack of job security	40
Overload of work	40
Strict rules and regulations	50
Management interference	55

According to table 1, when the respondents were asked to rank order 1 to 5, 55 out of 72 respondents felt the main reason for teachers to leave international schools is the interference of the management. 69% of the sample feel strict rules and regulations is also another cause. Lack of job security is another concern for the newly recruited teachers. In general, all teachers are recruited for a 6 months' probation period. There onwards, they are on a 1-year contract. Contracts will be renewed after an evaluation conducted by the HoD with the recommendations from the Head of Secondary and the Principal at the year-end. 40 of the respondents think the overload of work is also another reason for teachers to leave their jobs. There is an extensive amount of paperwork and planning, and preparation that is expected from a teacher. Many teachers are unable to handle this pressure. As a result, they tend to leave. 40% of the respondents believed that financial incentives will help to retain teachers and 30% agreed that reducing

## CONCLUSION

The findings of the study show that there are concerns in the teacher recruitment process in international schools. During the interview and lesson demonstration, other professional and personality traits are carefully considered in addition to the degree. Many of the applicants are ineligible to teach in these schools because the standards are so high. Therefore, there is a shortage of good teachers in all streams. Finding subject expertise with a thorough knowledge of the curriculum and good communication skills for subjects like History, ICT, and Geography in the Arts stream is not an easy task. Further, all teachers have not specialized in their subject, while some have done it as a minor subject at the degree level. According to the findings, the teacher turnover rate is very high in the Arts and the Technology streams. Managerial interference, strict rules and regulations, and overload of work are the top three reasons for this. Teachers who work in these schools are under stress because there are more protocols to follow and more paperwork to be completed regularly. The study also revealed that these schools need a system change. The management should rethink the teacher recruitment and retention protocols. It is important to retain teachers mainly by giving them monetary and non-monetary benefits. Therefore, in line with the

findings of this study, the following suggestions are made:

1. New teachers should receive induction and mentoring programmes along with appropriate leadership support during their probationary period. The school should also organize effective professional development programmes with the aim of providing teachers with active opportunities to learn and develop their professional competencies.

2. The wider context, in which head teachers and the management operate, can create pressure that leads to an excessive workload that distracts teachers from teaching. This creates an unfavorable working environment and overburdens the teacher. Therefore, a right climate and a supportive school culture should be established. Unnecessary paperwork and interfering in their teaching should be avoided. More focus should be given to teaching and get the teachers to be accountable for what they teach. An internal digitalized system can be set up to increase efficiency.

## REFERENCES

- Balasooriya, B.M.J. (2013). Teacher Recruitment and Teacher Mobility in Sri Lanka. Commonwealth Education partnership 2012/2013, Commonwealth Secretariat. Nexus Strategic Partnerships.
- Clarke, K. L. (2022). Self-Care and Self-Advocacy for Improved Educator Engagement and Satisfaction: A Guide for Teachers and Administrators. In: Self-Care and Stress Management for Academic Well-Being., 1-23.
- Gunasekara, G. (2019). The muddle that is Sri Lankan Education.
- Lee, T.W., Mitchell T.R. (2011). Working in research teams: lessons from personal experiences. *Manag. Organ. Rev.* 7(3), 461–69
- Nishanthi, P. G. K. M. C. & Suraweera, S. M. B. L. (2020). An analysis of factors affecting to the teachers' retention in the rural schools with special reference to the Walapane educational zone of Nuwara Eliya district. *International Journal of Creative and Innovative Research in all Studies*, 2(8), 45-60.
- Odland, G. & Ruzicka, M. (2009). An investigation into teacher turnover in international schools. *Journal of Research in International Education*, 8(1), 5-29.
- See, B. H., Morris, R., Gorard, S. & Kokotsaki, D. (2020). Teacher Recruitment and Retention: A Critical Review of International Evidence of Most Promising Interventions. *Education Sciences*, 10(10), 262-280.





## Educational Technology Implications for Enhancing Reading Comprehension

S.Sunitha<sup>1\*</sup>, A .Catherin Jayanthi<sup>2</sup>

<sup>1\*</sup>Department of Education, Alagappa University, Karaikudi, India

<sup>2</sup>Department of Educaiton, Alagappa University, Karaikudi, India

### ARTICLE INFO

#### Article History:

Received Date: 01 July 2022

Accepted Date: 15 September 2022

#### Keywords:

Reading comprehension, Educational technology

#### Citation:

S.Sunitha, A. Catherin Jayanthi. (2022). *Educational Technology Implications for Enhancing Reading Comprehension*. Proceedings of SLIIT International Conference on Advancements in Sciences and Humanities, (11) October, Colombo, 22 - 26.

### ABSTRACT

Reading comprehension has always been a requirement for success in many facets of the educational system and in the majority of adult spheres of participation, since writing systems have been invented. In both the educational and therapeutic fields, the greater accessibility of technologies and web-based resources can be a truly valuable assistance for creating training exercises that can also be completed remotely. Studies that have looked at the effectiveness of technology for children with reading comprehension issues can be found in recent literature. The current study presents information on a technological tool for improving reading comprehension on 40 secondary school pupils. The students were trained to read, to spell with proper stress, idioms and phrases and also comprehension for understanding. These all were taught with the help of technology. The findings have both clinical and educational implications as they suggest the possibility to promote reading comprehension with a suitable technology.

### INTRODUCTION

A crucial cognitive skill for kids is reading comprehension, which helps them succeed in school and participate in most aspects of adult life (Hulme and Snowling, 2011). Children with learning impairments (LD) and special educational needs who experience challenges with text comprehension, often in conjunction with other issues, may therefore be at an elevated risk for failing in life as well as in school

\* S.Sunitha, yogucharu@gmail.com

(Woolley, 2011). Reading comprehension is a complex cognitive skill that requires not only linguistic (such as vocabulary and grammatical knowledge), but also cognitive (such as working memory, De Beni and Palladino, 2000), and metacognitive skills (both for the aspects of knowledge and control, Channa et al., 2015). In particular, higher order comprehension skills like the creation of inferences are among these cognitive abilities (Oakhill et al., 2003).

Text comprehension is now based on an increasing number of digital reading devices (computers and laptops, e-books, and tablet devices), which can become a crucial support to enhance traditional reading comprehension and learning skills. This is due to the diffusion of technology in many areas of daily life (e.g., inference generation).

Some authors have compared the effects of the technological interface on reading comprehension vs. printed texts in youngsters with standard development (Kerr and Symons, 2006; Ride out et al., 2010; Mangen et al., 2013; Singer and Alexander, 2017; Delgado et al., 2018). As a result, it has been found out that children and adolescents perform lower on comprehension tests when reading screen texts compared to written materials (Mangen et al., 2013; Delgado et al., 2018), though they prefer digital texts to printed ones (Singer and Alexander, 2017). Only a few research on children with learning issues have compared printed books to digital devices (Chen, 2009; Gonzalez, 2014; Krieger, 2017), and no discernible differences have been identified. This suggests that kids with learning issues can employ compensatory digital tools.

In order to enhance teaching and learning, the field of research known as educational technology looks at the process of analyzing, designing, developing, implementing, and evaluating the instructional environment, learning materials, students, and the learning process. Middle school students' learning settings for boosting literacy acquisition serve as evidence that technology can enhance reading comprehension.

Due to the ability in making modern teachers incorporate new technologies and tools into their classrooms, technology in education is crucial. The learner-centeredness of the classroom can be enhanced by the teachers. It enables educators to interact with pupils in distinctive, original, and fair ways. Teachers can connect with other teachers and educators

locally, nationally, and internationally to broaden their networks.

## **MATERIALS AND METHODS**

On finding the difficulties in reading among the secondary school students the researcher analyses the effect of implementing e technology in the education to enhance the reading comprehension of secondary school students. Thus, the study is entitled as "Educational Technology Implications or Enhancing Reading Comprehension".

To fulfill the research aim, 40 IX standard students were randomly selected-in form of two intact classes; through the convenience approach. These participants formed two cohorts for this study, i.e. an experimental group (n=40) and a control group (n=40). The present research pursues the effect of using technology to enhance the reading comprehension among students. It tries to show the positive effects of using technology to improve both the teaching and learning process.

## **HYPOTHESIS OF THE STUDY**

To assess the effectiveness of implementing technology in enhancing the level of reading among secondary school students

## **READING COMPREHENSION**

Reading comprehension refers to the capacity to read, analyse, and comprehend literature. It depends on two interconnected skills: language comprehension and word reading (the ability to interpret the symbols on the page) (being able to understand the meaning of the words and sentences). There are essentially two types of understanding processes. The first form, which relies on textual cues, is known as "bottom-up processing," and it entails translating a variety of written symbols into their auditory equivalents. Understanding texts is an interactive process between readers' comprehension of a text and the recognition of written symbols in words, whereas the second type—known as "top-down processing"—uses information outside the text and involves the reader in the process of reconstructing meanings rather than merely decoding forms.

The reading strategy changes depending on the reading goals. The list of reading materials now includes letters (both formal and personal), pamphlets, stickers on cans, tins, and containers, advertising, periodicals, and more in addition to books and journals. There will also be included emails, instant messaging, and various texts from the Internet and social media. These text formats aren't all handled in the same way. As a result, reading can be categorized into three different purposes: 1) learning broad information from a text, 2) learning specific information from a text, and 3) reading for enjoyment or interest (McDonough, et al., 2013:110-111).

## **THE PROCEDURE**

The method employed in this study is experimental because it entails instructing a reading comprehension course while utilizing technological concepts and procedures. Additionally, the experimental procedure entails pre- and post-tests that are administered by the control group (40 students) and the experimental group before and after the course (40 students).

## **DATA COLLECTION INSTRUMENT**

The students of the experimental community are chosen from the secondary school students. According to the accomplishments of the students in the pre-test, the option was made. Group (A) was selected as the experimental group after comparing the average of the scores of students in the pre-test., while group (B) was selected as the control group because of its high mean in the pre-test. The experimental group which is group (A) consists of 40 students, and the control group which is (B) consists of 40 students. The pre and post-tests are employed for both the experimental and control groups. In this design, the experimental and control groups are selected according to their achievement in the pre-test. Then, a post-test is administered to collect data about the student's achievements in reading comprehension after the experimental course.

## **DATA ANALYSIS**

Data gathered was entered and treated with SPSS software. The mean and standard deviation was used to find out if there were any

significant differences between control and experimental group results in both pre and post-tests. These assessments contained questions that concentrated on testing participants; reading comprehension abilities and the ability to use reading comprehension techniques. The assessments were adopted from their English text. To begin the comparison, the descriptive statistics for the success of participants in the pre-test reading comprehension in the two groups were measured first. The related descriptive statistics were manifested in Table (1). To carry on the comparison; first the descriptive statistics for participants' performances in the reading comprehension pre-test in the two groups were calculated.

As shown in Table (1), the mean experimental group score was ( $M = 30.03$ ) with the standard deviation ( $SD = 2.79$ ); while the mean control group score was ( $M = 17.83$ ) with the standard deviation ( $SD = 2.42$ ). The mean of reading comprehension on the pre-tests of the two groups was varied, indicating that they were not at the same stage of reading comprehension skills. Based on these findings the experimental group was selected to apply the reading comprehension course by using technology. In order to compare the mean control and experimental group scores in the post-test, the performance of the participants in the post-test reading comprehension was evaluated in both groups. The associated descriptive statistics are shown in Table (2) below.

Table (2) above shows that the average experimental group score was ( $M = 55.50$ ) with the standard deviation ( $SD = 2.97$ ). On the other hand, the mean control group score was ( $M = 43.26$ ) with the standard deviation ( $SD = 2.92$ ). At the same time, the means of reading comprehension of the two groups; post-test performance werenot far from each other and their standard deviations were very different from each other. These findings wereobtained by comparing the means of the two groups in each pre-and post-test. However when these findings werecompared by group achievement in both experiments, it was apparent that the average mean of the experimental group improved from pre-test to post-test. The findings indicated that the level of achievement of the experimental group in the post-test was higher than that of the pre-test The matter varies according to the results of the control

group in the pre-and post-tests; the mean for this group in the pre-test was (M = 17.83), while the mean for the post-test was (M = 43.26). These findings were almost identical to each

other and show that there was no disparity in output within the control group in both experiments.

Table: 1 Descriptive statistics for control and experimental group pre-test (reading comprehension)

Source	N	Mean	SD	't' Value
Experimental Group	40	30.03	2.79	17.88
Control Group	40	17.83	2.42	

Table: 2 Descriptive statistics for control and experimental group post-test (reading comprehension)

Group	N	Mean	SD	't' value
Experimental Group	40	55.50	2.97	15.43
Control Group	40	43.26	2.92	

## RESULTS AND DISCUSSION

Current research is performed by posing two questions which discuss particular aspects of the teaching and learning process of EFL. The first research question discusses the feasibility of incorporating technological strategies, especially in reading comprehension classes, into the EFL teaching process. The experiment was carried out using some technological concepts and methods to teach a reading comprehension course. The result shows the positive effects on using the technology in enhancing reading comprehension. Then the success of the students after taking this course is calculated by comparing the outcomes of the pre-and post-tests with the two classes participating in the study, i.e. the experimental and control groups. Compared with no variation in importance in the scores of the control group students, the findings indicate a substantial increase in the scores of the experimental group students. The second study issue discusses the effect of educational technology strategies on enhancing or improving the entire method of teaching and studying and encouraging students to become successful learners. For both groups, descriptive statistics

of test benefit scores for pre- and post-tests indicate that the experimental group performs better than the control group on the post-test. Then after the post-test, the effects have improved, and the impact size can be determined on the standard deviation from the sum of the mean variance. In brief, the educational study group outperforms the control group, showing the effectiveness of using technology to increase the degree of accomplishment for students.

## CONCLUSION

The ways in which we live, work, play, create, and communicate are all being altered by technology. Therefore, it makes sense that developments in digital technology also bring about revolutionary opportunities in the field of education. Technology is giving educators new ways to develop and engage students' minds. The potential of assistive technology, virtual and augmented reality, high-tech collaboration tools, gamification, podcasting, blogging, 3D printing, artificial intelligence, personalised learning, and many other things are currently generating growing interest. New advanced degree programmes have emerged in recent

years as a result of growing interest in educational technology. These programmes are intended to enable teachers to adopt an innovator's mentality and become transformative technology leaders in their classroom, school, or district.

## REFERENCES

Beck I. L., Perfetti C. A., McKeown M. G. (1982). Effects of long-term vocabulary instruction on lexical access and reading comprehension. *J. Educ. Psychol.* 74, 506–521.

Channa M. A., Nordin Z. S., Siming I. A., Chandio A. A., Koondher M. A. (2015). Developing reading comprehension through metacognitive strategies: a review of previous studies. *Eng. Lang. Teach.* 8, 181–186.

Chen H. (2009). Online reading comprehension strategies among fifth- and sixth-grade general and special education students. *Educ. Res. Perspect.* 37, 79–109. [Google Scholar]

Cornoldi C., Carretti B., Colpo C. (2017). Prove MT-Kit Scuola. Dall'autovalutazione degli 88 Apprendimenti di Lettura e Comprensione Al Potenziamento. [MT-Kit for the Assessment In The School. From Reading Assessment To Its Enhancement]. Firenze: Giunti Edu. [Google Scholar]

Cullen J. M., Alber-Morgan S. R., Schnell S. T., Wheaton J. E. (2014). Improving reading skills of students with disabilities using headsprout comprehension. *Remed. Spec. Educ.* 35, 356–365. [Google Scholar]

De Beni R., Palladino P. (2000). Intrusion errors in working memory tasks: are they related to reading comprehension ability? *Learn. Individ. Differ.* 12, 131–143. [Google Scholar]

Delgado P., Vargas C., Ackerman R., Salmerón L. (2018). Don't throw away your printed books: a meta-analysis on the effects of reading media on reading comprehension. *Educ. Res. Rev.* 25, 23–38. [Google Scholar]

Gonzalez M. (2014). The effect of embedded text-to-speech and vocabulary eBook scaffolds on the comprehension of students with reading disabilities. *Intern. J. Spec. Educ.* 29, 111–125. [Google Scholar]

S Sunitha, A. Catherin Jayanthi (2021). The Concept of Neuro-Linguistic Programming in Improving the Receptive Skills in English Rupkatha Journal on Interdisciplinary Studies in Humanities, 13 (1) [Google Scholar]

# **English Language and Literature**



## The Use of Audio and Audio-visual Materials for Teaching Process Descriptions and Identification of Errors: A Study with Tertiary Level Students

Wijesuriya, K.G.<sup>1\*</sup>, Dissanayake D.M.M.S.<sup>2</sup>

<sup>1\*</sup>English Language Teaching Unit, Faculty of Humanities and Sciences, Sri Lanka Institute of Information Technology (SLIIT), Malabe, Sri Lanka.

<sup>2</sup>English Language Teaching Unit, Faculty of Humanities and Sciences, Sri Lanka Institute of Information Technology (SLIIT), Malabe, Sri Lanka.

### ARTICLE INFO

#### Article History:

Received Date: 01 July 2022

Accepted Date: 15 September 2022

#### Keywords:

Audio Material; Audio-Visual Material; Process Descriptions; Surface Strategy Taxonomy

#### Citation:

Wijesuriya, K.G., Dissanayake D.M.M.S. (2022). *The Use of Audio and Audio-visual Materials for Teaching Process Descriptions and Identification of Errors: A Study with Tertiary Level Students*. Proceedings of SLIIT International Conference on Advancements in Sciences and Humanities, (11) October, Colombo, 28 - 33.

### ABSTRACT

The use of multimedia as a teaching aid could motivate students in learning and improve their writing skills. The objectives of the study are to assess the impact of audio-visual and audio materials in the lesson on second language learners' writing skills and to analyse errors in the writings. Forty Engineering undergraduates in their first term at CEFR (Common European Framework of Reference) B1 level in proficiency were randomly divided into two comparison groups: Audio-visual Group and Audio Group; to teach them to write a brief description of an industrial process using Audio-visual and Audio materials. The marks of the immediate and post-tests were analysed using independent sample t-test whereas errors in their writings were categorized based on Surface Strategy Taxonomy. The findings depicted that both Audio-visual and Audio materials have contributed to writing effective process descriptions. While the mean of the Audio group was numerically higher than that of the Audio-visual group in both immediate and posttests, the independent sample t-test confirmed that the difference was not statistically significant. Neither of the modes has been demonstrated superior to the other. Moreover, error analysis based on Surface Structure Taxonomy depicted that over 50% of errors committed by students in both groups were errors of Misformation. Further, second,

\*Wijesuriya, keshani.w@slit.lk

third and the fourth frequent number of errors were found in the Omission category, Misordering Category, and Addition category respectively for both groups. Therefore, a mixture of Audio-visual and Audio materials could be recommended in writing tasks pertaining to process descriptions.

## **INTRODUCTION**

The constantly evolving landscape of teaching and learning English as a Second or Foreign language (ESL and EFL) continues to identify the impact of different multimedia technologies on the teacher and the learner. Audio and Audio-visual materials have gained much attention when employing technology in the language classroom, thereby leading to much research on language learning through audio and audio-visual materials. The present study focuses on the impact of employing Audio-visual and Audio materials separately in teaching to write a description of an industrial process to tertiary level students. Furthermore, an analysis is done on the types of errors that are present in students' written descriptions based on the Surface Strategy Taxonomy.

Writing being a complex intellectual skill, many students find writing tasks to be challenging, especially in a Second or Foreign Language, while instructors face challenges in effectively teaching this demanding skill (Abdullah et al., 2020). Therefore, it is necessary to explore methods of facilitating an effective teaching and learning experience. The writing task on describing an industrial process in the study is an important writing activity for students following technical sciences. Process descriptions are mostly incorporated into larger texts such as technical reports and instruction manuals (Britton, 1965; Ye, 2020). There arise situations where it is required to present such descriptions to a technical or general audience. Consequently, English for Academic Purposes (EAP) and English for Technical Sciences (ETS) courses incorporate teaching how to write descriptions of industrial processes into their curricular.

## **USING AUDIO AND AUDIO-VISUAL MATERIALS IN LANGUAGE TEACHING**

Scholars have focused on using audio-only and most importantly, audio-visual material to enhance learners' English language skills.

Mayer's "Cognitive Theory of Multimedia Learning" is a much sought-after framework to understand the effectiveness of multimedia methods. According to the first three principles of this theory, there are two different channels for processing visual/pictorial material and for processing auditory/verbal material. The second principle is that the limited capacity of each channel allows only a few pieces of information to be processed at a time. Thirdly, learning occurs only if active processing takes place (Clark and Mayer, 2013, pp. 79-82; Clark and Mayer, 2016, as cited in Carmichael et al., 2018). The learners create a mental model of the material, using the relevant sounds, words, and images they have selected to be processed. Then, they integrate a mental model of new material that also incorporate their prior knowledge resulting in meaningful learning. For learning to have occurred properly, it is necessary that learners retain, retrieve, and apply knowledge, both in the short- and long-term. Considering the impact of visual and verbal materials on learning, the modality principle in the cognitive theory of multimedia learning states that it would be more effective to use audio over written text while it is likely that Audio-visuals might be more effective when used with audio narration rather than written text in the Audio-visual (Carmichael et al., 2018). Accordingly, the present research considers both the immediate and later application of knowledge by the participants and compares the effectiveness of the audio and audio-visual methods.

Research in ESL has focused on using audio-visual aids to improve the language skills of learners. The use of audio and audio-visual material has yielded positive results in improving students' memory and stimulating and facilitating the process of speaking and listening skills in certain recent studies by Kausar (2013), Yunus et al. (2018), and Albahiri and Alhaj (2020) as cited in Kathirvel and Hashim (2020). In addition, Abdulrahman et al. (2020) in their systematic review of research from the year 2000 onward on different multimedia tools in the teaching and learning processes highlight that mainly since the year 2012, the use of Audio and Audio-visual material has seen increased and consistent popularity. Overall, while the use of audio and audio-visual materials in improving the speaking and listening skills of English language learners has received much scholarly attention,



less emphasis has been given to comparatively examining the effect of these two methods in enhancing writing skills at the tertiary level, especially in the technical sciences. Thus, it can be said that the present study is based on a timely topic that deserves further examination.

### **SURFACE STRATEGY TAXONOMY (SURFACE STRUCTURE TAXONOMY) FOR ERROR ANALYSIS**

To examine the errors made by the participants in their industrial process descriptions, the Surface Strategy Taxonomy (Surface Structure Taxonomy) by Dulay, Burt, and Krashen, which focuses on how surface structures are altered, was used in this study. Using this taxonomy, errors are divided into four categories by Dulay et al. (1982, p. 150): (1) omission, (2) additions, (3) misformation, and (4) misordering. Firstly, Omission refers to a type of error where an item that must be present in a well-formed utterance is absent. For instance, a sentence could lack the proper noun and verb inflections, articles, or prepositions. Next, Additions include the presence of an extra item that should not be present in a well-formed utterance. Additions are sub-categorized by Dulay et al. (1982) as follows: (a) double markings, (b) regularization, and (c) simple addition (pp. 156-158). The third category, Misformation, refers to the use of the wrong form of the morpheme or structure. It is divided into three sub-categories as (a) regularizations, (b) archi-forms, and (c) alternating forms (Dulay et al., 1982). Lastly, Misordering takes place when a morpheme or a group of them is incorrectly placed in an utterance. Two sub-categories are identified: (a) archi-forms and (b) alternating forms (Dulay et al., 1982).

Surface strategy taxonomy has been used to analyse writings mostly based on ESL students' compositions: paragraphs and essays on general topics. Most errors revealed through these studies fall under the categories of Misformation and Omission (Al-husban, 2018; Barzegar, 2013; Cruz, 2019; Maniam and Rajagopal, 2016, as cited in Rusmiati, 2019; Pandapatan, 2022). Thus, while the surface strategy taxonomy has received due attention in research, a dearth is present in error analysis studies on ETS learners' writing skills. This research would therefore contribute to filling this gap.

### **RESEARCH OBJECTIVES**

One objective of this study is to identify which multimedia tool, audio-only or audio-visual, is more effective in teaching writing skills to technical sciences students. The second objective is to examine the errors most commonly present in students' descriptions of industrial processes.

### **MATERIALS AND METHODS**

The participant group consists of forty (40) first-year engineering undergraduates of a reputed private university in Sri Lanka. These students follow English Language Skills 1, which is offered to first-year first-semester engineering undergraduates, and which consists of lessons on English for general and academic purposes and technical sciences. Two groups of mixed-ability students, 20 in each group, were taught how to write a description of an industrial process by using audio-only material for one group, and audio-visual material for the other group as aids. The two groups were given the same immediate test and two weeks later, a similar post-test. The two groups will hereafter be referred to as the Audio Group (AG) and the Audio-Visual (AVG) Group. The audio and audio-visual material included a clip on bubble gum making based on which a presentation was done. Thereafter, a clip on the paper-making process at a wood yard (a 4-minute clip, taken from <https://www.sappi.com/>) was used for the immediate test, and a clip on the chocolate-making process taken from YouTube was used for the post-test.

Initially, the two groups were exposed to the Audio/Audio-visual clip of the paper-making process and were required to complete a warm-up activity where they had to match activities related to pulp-making process with their respective purpose (given in a table). After the second exposure to the clip, the students were required to fill in the blanks with the correct forms of the given verbs to complete a description of the pulp-making process. This activity was taken as the immediate test. Two weeks later, the groups were exposed to the Audio/Audio-visual clip on the chocolate-making process. During the first exposure, they were asked to take down notes, and after the second exposure, they were required to write a description of the process (approximately 150

words) comprising of a short introduction, the process steps in passive voice and with suitable sequence markers, and a short conclusion.

Out of the answers submitted by the fifty students in the Audio and Audio-Visual groups, forty answer sheets where all the exercises were completed, were selected for analysis (better to remove this?). The marking focused on the grammatical accuracy of the process description. The marks obtained by the two groups at the immediate and post-tests were analysed using the independent sample t-test. Furthermore, the errors made by students in each group were comparatively analysed based on the Surface Strategy Taxonomy.

## RESULTS AND DISCUSSION

### Summary Statistics of the immediate test and the post-test

The following results were obtained in the AVG and the AG:

Table 1: Summary Statistics of the Immediate Test

<i>Group</i>	<i>N</i>	<i>Mean</i>	<i>SD</i>	<i>SE</i>	<i>Min</i>	<i>Median</i>	<i>Max</i>
AVG	20	7.4	1.97	0.44	4	8	10
AG	20	7.7	1.45	0.32	5	8	10

Table 2 – Basic Statistics of the Post-test

<b>Group</b>	<b>Mean</b>	<b>SD</b>	<b>SE</b>	<b>Min</b>	<b>Median</b>	<b>Max</b>
AVG	6.82	1.98	0.44	5	7.25	9.5
AG	7.1	2.15	0.48	3	7.50	10

**SD** = Standard Deviation, **SE** = Standard error

Results in Table 1 depict that the marks of the immediate test in the AVG varied between 4 and 10 with a mean of 7.4 and SD of 1.97. The marks of the AG varied between 5 and 10 with a mean value of 7.7 and SD of 1.45. Furthermore, the median value in both classes stood at 8. It was noted that the use of Audio materials and AV materials have significantly impacted student comprehension of describing processes.

According to table 2, marks of the AVG varied between 5 and 9.5 with a mean and SD of 6.82 and 1.98 respectively. The median value was 7.25 in the AVG. However, the marks of the post-test in the AG varied between 3 and 10 with a mean and SD of 7.1 and 2.15 respectively. The Median value in the AG was 7.5.

### Independent Sample t-test results of the immediate and post tests

In addition, the statistical significance of the marks under two modes depicted through writings on describing processes at the immediate test and posttest was verified through independent sample t-tests which are as follows:

Table 3: T-test results-Immediate test

<i>Immediate Test</i>	<i>AVG</i>	<i>AG</i>
Mean	7.47	7.70
SE	0.44	0.32
DF	38	
T-Value	-0.41	
P-Value	0.68	

Table 4: T-test results-Post test

<i>Post Test</i>	<i>AVG</i>	<i>AG</i>
Mean	6.82	7.1
SE	0.44	0.48
DF	38	
T-Value	-0.42	
P-Value	0.67	

Under the assumption of equal variances between two groups, the observed test statistic was -0.41 and the corresponding P-value was 0.68 which is higher than the standard significance level of 0.05. As the P value (0.68) was over 5%, it can be concluded that the mean marks of the group which based its learning on AV materials and the Group that centralized its learning on Audio materials were not significantly different. Therefore, it is noted that the Audio-visual and the Audio materials have equally enabled students' understanding of describing processes.

Similarly, the mean marks of the post-test between the AVG and the AG showed no significant difference (Test statistic = -0.42 and P-Value = 0.67). Since the P-value was 0.67 which is higher than the standard significance level of 0.05, there was no statistically

significant impact generated through these varying materials as shown in students' writings on describing processes.

The mean value of the test results in the AG which used audio materials as teaching aids was numerically higher than that of the AVG which used Audio-visual materials as teaching aids. However, statistical analysis of the said difference through the independent sample t-test depicted that even though the mean values were numerically higher in the audio class both at the immediate and posttests, it was not statistically significant.

### Error analysis based on Surface strategy Taxonomy

The writing task on describing the chocolate making was analyzed using Surface Strategy Taxonomy and the errors were subsequently categorized into Omission, Addition, Misordering, and Misformation. The results are as follows:

Table 5: Error Description according to Surface Strategy Taxonomy

Gro up	Omis sion	Addit ion	Misord ering	Misform ation	To tal
AV G	22	1	12	41	76
<b>100 %</b>	<b>29%</b>	<b>1%</b>	<b>16%</b>	<b>54%</b>	
AG	15	5	14	36	70
<b>100 %</b>	<b>21%</b>	<b>7%</b>	<b>20%</b>	<b>51%</b>	

According to the analysis, 76 errors have been recorded in the process descriptions of the Audio-visual group whereas a total of 71 errors have been found in the process descriptions of the Audio group. The maximum number of errors in the process descriptions in both the Audio-visual and Audio Groups appears under the Misformation category. Thus, Misformation errors in the Audio and Audio-visual Groups were 54% and 51% out of the total errors respectively. The second frequent number of errors were recorded under the Omission category which was 29% in the Audio-visual group and 21% in the audio Group. Errors of Misordering were 16% in the audio-visual Group while 20% of Misordering errors were recorded in the Audio Group. The least number

of errors were recorded in the Addition category with 1% in the Audio-visual Group and 7% in the Audio Group.

There was no significant disparity in the number of errors committed by the students in the Audio-visual Group and the Audio Group despite differentiated materials used in the teaching. Moreover, it is also evident that a majority of errors recorded in both groups were under the Misformation category and there was a significant similarity in the percentages of both groups. Further, second, third and the fourth frequent number of errors were found in the Omission category, Misordering Category, and Addition category respectively for both groups. It was also observed that there was a noteworthy similarity in the percentages committed under each category.

### CONCLUSION

Delivery of English lessons online demanded a change in the materials used in ordinary physical lessons due to the necessity of retaining the motivation and interest of the students. While audio-visual and audio materials were used in the traditional classrooms earlier, the current strategy focuses on using solely audio-visual materials or Audio materials in the lesson consistently to measure the relative impact on developing their writing skills. Accordingly, errors committed by each group of students were analysed and categorized to identify specific deviances in their knowledge in an attempt to remedy them. Hence, it was found that Audio-visual materials as well as Audio materials have significantly impacted in developing writing skills of students in describing a technical process in the respective groups at the immediate and post-tests. These findings comply with the outcome of many studies (Kausar,2013; Yunus et al.,2018; Albahiri and Alhaj, 2020). While the test results of the Audio Group were marginally higher in the immediate and post-tests than the results of the Audio-visual group, this numerical value was found to be statistically insignificant. Therefore, it can be concluded that the usage of Audio-visual materials, as well as Audio materials, significantly affects improving writing skills of students when they are used according to the lesson. It could also be recommended to use a combination of both Audio-visual and Audio materials in teaching concepts related to improving writing skills.

Moreover, over 50% of errors in student writings in both the classes were categorized as errors of Misformation, irrespective of the difference in teaching material used in each class. These errors occur when the wrong form of the morpheme or structure has been used in an utterance (Ma'mun ,2016). Therefore, in internalizing the grammar basics related to process descriptions, teachers are recommended to emphasize the accurate form of the morpheme or structure; for example: forming the correct past participle form of the verb in writing simple present passive sentences.

The findings of the current study can be broadly examined by using a diversified sample of students and studying several interventions over a period of time under each material usage. Also, a third experimental group that uses a mixed approach in describing a process could further validate the findings of the study. Moreover, the size and the length of exposure could be factors that affect generalization.

## ACKNOWLEDGEMENT

First and foremost, we are sincerely grateful to the Faculty of Graduate Studies at the selected Higher Educational Institute for permitting us to conduct the study with the selected undergraduates. Moreover, the completion of the study could not have been possible, without the cooperation given by the research participants. Thus, their contribution is much appreciated and highly acknowledged.

## REFERENCES

Abdulrahman M. D., Faruk N., Oloyede A. A., Surajukeen-Bakinde N. T., Olawoyin L. A., Mejabi O. V., Imam-Fulani Y. O., Fahm A. O., Azeez A. L. (2020). Multimedia tools in the teaching and learning processes: A systematic review. *Heliyon*, 6(11).

Britten W. E. (1965). What is technical writing? *College Composition and Communication: Critical Theory and the*

*Teaching of Composition, Satire, Autobiography*, 16(2), 113-116.

Carmicheal M., Reid A., and Karpicke J. D. (2018, February 20). Assessing the impact of educational video on student engagement, critical thinking, and learning: The current state of play. SAGE.

Clark R. C., & Mayer R. E. (2013). *E-Learning and the science of instruction* (3rd ed.). Pfeiffer.

Dulay H.C., Burt M.K. and Krashen S.D. (1982). *Language two*. Oxford University Press.

Hazlina Abdullah, Azni Mohamed Zain, Nursyuhada' Ab Wahab, Mohd Muzhafar Idrus, Mas Rynna Wati Ahmad. (2020). A process approach in the teaching of writing: Saving 21st century learners from writer's block. *Universal Journal of Educational Research*, 8(12), 7160 - 7174.

Kathirvel K., & Hashim H. (2020). The use of audio-visual materials as strategies to enhance speaking skills among ESL young learners. *Creative Education*, 11, 2599-2608.

Ma'mun N. (2016). The grammatical errors on the paragraph writings. *Vision Journal for Language and Foreign Language Learning*, 5(1), 95.

Pandapatan A. T. (2022). Surface structure taxonomy on journal texts: The case of Filipino ESL learners. *International Journal of Linguistics, Literature and Translation*, 5(4), 56-65.

Rusmiati R. (2019). Surface strategy taxonomy on foreign language writing: A study on verb tense usage. *Jurnal Serambi Ilmu*, 20(02), 189-201.

Ye Y. (2020). EAP for undergraduate science and engineering students in an EFL context: What should we teach? *Ampersand*, 7.



## An Analytical Study of the Factors Influencing the English Speaking Proficiency of Prospective English Medium Teachers

Uditha Amaratunga<sup>1\*</sup>

<sup>1</sup>Pasdunrata National College of Education, Sri Lanka

### ARTICLE INFO

#### Article History:

Received Date: 01 July 2022

Accepted Date: 15 September 2022

#### Keywords:

English speaking proficiency, English medium instruction, Prospective English medium teachers, National Colleges of Education

#### Citation:

Uditha Amaratunga. (2022). *An Analytical Study of the Factors Influencing the English Speaking Proficiency of Prospective English Medium Teachers*. Proceedings of SLIIT International Conference on Advancements in Sciences and Humanities, (11) October, Colombo, 34 - 39.

### ABSTRACT

National Colleges of Education (NCOEs) conduct Pre-service Teacher Education courses in English medium to cater to the demand of English medium teachers to implement bilingual / bi-medium education in government schools. Although English speaking proficiency is very important to English medium teachers, it has been revealed that the majority of the prospective teachers who follow the Information Communication Technology (ICT) course in NCOEs do not have the required level of English speaking proficiency. This paper discusses the nature of the English speaking deficiencies of prospective English medium teachers of ICT and the major factors that affect their English speaking proficiency. This analysis was done as part of an ongoing study conducted using the Mixed Methods approach. Quantitative and qualitative data was gathered through questionnaires, interviews and documentary analysis from a sample of prospective teachers of ICT, English medium lecturers who teach in the ICT course in three NCOEs, Directors of Education at the Ministry of Education and Senior Lecturers at the National Institute of Education. Findings revealed that the prospective English medium teachers' English speaking proficiency is lower than that of the other language skills due to several psychological, linguistic and socio-cultural factors. Therefore, effective strategies should be introduced to improve the Teacher Education Programme of the NCOEs to enhance the development of English speaking

\*Uditha Amaratunga,

proficiency of prospective English medium teachers.

## INTRODUCTION

According to the Service Minute of the Sri Lanka Teachers' Service, holders of National Diploma in Teaching from NCOEs are recruited to Class 3- Grade I (b) of the Teachers' Service as non-graduate teachers with a professional qualification. NCOEs conduct the Pre-service Teacher Education courses in Sinhala, Tamil and English media to award the above diploma. The applicants can select the medium of instruction of the course they apply for according to their aspirations and proficiency in the target language, provided they have fulfilled the entry requirements specified in the relevant gazette notification. Accordingly, prospective teachers who enrol for the English medium courses have to follow lectures in English, face internal and external examinations in the English medium and above all they have to teach in English. Once they are appointed to schools they have to serve as English medium / bilingual teachers. In the bilingual approach teachers have to use the students' second language (L2) as much as possible and their first language (L1) where necessary. As English is the L2 in the Sri Lankan context, English medium teachers' oral proficiency in it is a significant factor in the teaching learning process.

Communicative competence of teachers is a conducive factor for the achievement of educational objectives. As Low, Chong & Ellis (2014) state, if there is a mismatch between what is conveyed and what was intended to be conveyed, even the best teaching decisions can bring out ineffective teaching outcomes. In relation to this theorizing, NCOE lecturers have identified that the English speaking proficiency of the majority of prospective teachers of ICT is low. They add further that the prospective teachers' inability to express themselves fluently and confidently in the target language hinders their performance in classroom teaching and consequently it may have a negative impact on the achievement of the expected instructional objectives as the students may face difficulties in following and understanding the teachers' instructions and explanations. Therefore, an investigation into this issue has become a current need.

This ongoing study is focused on the English speaking proficiency of prospective teachers of

ICT. As the ICT course is conducted only in English medium, the applicants do not have a choice regarding the medium of instruction. As a result, eligible candidates who are interested in following this course (including those who have the minimum entry qualification in English language) apply without considering much about their proficiency in the target language. As they have to deliver their lessons in English, their oral proficiency in the target language is a conducive factor for successful performance. However, according to the observations of the lecturers, English speaking proficiency of the majority of the prospective teachers of ICT is not at a satisfactory level.

Several local and international studies have been conducted on the English language proficiency of English medium instruction teachers. Baloch (2003) cited in Gul and Aziz (2015) states that when English is considered as the medium of instruction, it is directly linked to the speaking competency of the teachers. According to Richards (2010), it is important to ensure that student teachers are able to carry out the specific linguistic tasks especially when they are teaching in contexts where English is the medium of instruction. As he further notes, to achieve these highly demanding tasks, pre-service and in-service teachers need to have a satisfactory level of English proficiency. Moreover, effective communication skills is one of the standards for the teachers in many countries in the world (Aslam, 2011; Cammarata, 2010).

Although proficiency in speaking in English is of critical importance to teachers who are supposed to teach in the English medium, research findings reveal that in many parts of Sri Lanka there is a shortage of English medium teachers who are proficient in speaking English. In a case study carried out in Jaffna District, Balakrishnar and Thanaraj (2011) identified that there is a serious lack of teachers who are competent to teach in English and there are not enough in- service training programmes for English medium teachers and even those which are available are of low quality. National Education Commission (2016) too reveals that there is a shortage of subject teachers who are proficient in English and trained to teach bilingually. It further emphasizes the necessity of recruiting competent teachers who are fluent in English to teach selected subjects in English medium to enhance successful implementation of bilingual education in Sri

Lanka. Though this situation is subject to discussion in the field, a formal study related to the English language proficiency of prospective English medium teachers in the NCOEs has not been conducted yet. Therefore, this ongoing study attempts to fill that gap.

This paper focuses on the following research objectives.

1. To examine the nature of the English speaking deficiencies of prospective English medium teachers of the ICT course.
2. To identify the major factors influencing the English speaking proficiency of prospective English medium teachers.

## **MATERIALS AND METHODS**

In the study, the Convergent Parallel Mixed Methods design which involves simultaneous collection of quantitative and qualitative data was used. The main reason for selecting the mixed methods design is the need to use both quantitative and qualitative data. As Cresswell (2012, p.540) points out, a basic rationale for using mixed method design is that “one data collection form supplies strengths to offset the weaknesses of the other form and that a more complete understanding of a research problem results from collecting both quantitative and qualitative data”. Further, the convergent parallel design enables the researcher to collect quantitative and qualitative data concurrently, analyze the two data sets separately and mix the two databases by merging the results during interpretation (and sometimes during data analysis).

Population of this study consists of prospective English medium teachers in eight NCOEs. A sample of 165 prospective teachers of ICT was selected from three NCOEs, proportionate to the number in each college using the quota sampling method, and data was gathered using questionnaires and interviews. A purposive sample which consists of the professionals who have in-depth knowledge, expertise and experience in the relevant fields was used as other informants. Quantitative and qualitative data was gathered from two Directors of Education from the National Colleges of Education Branch and Bilingual Education Branch of the Ministry of Education, two Senior Lecturers of the National Institute of

Education who are involved in designing syllabi for NCOE courses, and thirty five English medium Lecturers including ELT specialists who teach in the ICT course at Pasdunrata, Maharagama and Ruwanpura NCOEs.

## **METHODS OF DATA COLLECTION**

In the current study, quantitative data was gathered through semi structured questionnaires, and qualitative data through documentary analysis and interviews; in relation to the specified objectives to assure validity, reliability as well as for the purpose of triangulation. Government Gazette Notifications related to the recruitment of prospective teachers to NCOEs (specially to follow English medium courses) were analysed and interpreted along with the perceptions of the lecturers regarding the suitability of the selection criteria for the ICT course versus the other English medium courses. The General English syllabus prescribed for the pre-service teacher education courses conducted by NCOEs was analysed to find out the provision for the development of speaking proficiency of the prospective English medium teachers.

## **RESULTS AND DISCUSSION**

Quantitative data was analyzed using tables, graphs and descriptive statistical methods and qualitative data was analyzed using coding and thematic analysis in relation to the research objectives. Information given in the questionnaires was strengthened by the explanations done at the interviews. Findings have revealed the prospective teachers' general proficiency level in English at the beginning of the teacher education course and several deficiencies specific to their speaking skills. A majority of the prospective teachers of ICT have not shown a very good performance in the core skills in English. Moreover, their proficiency in speaking and grammar has been much lower than the other skills.

As shown in Figure 3, ELT lecturers have revealed that a considerable number of prospective teachers make frequent errors in their speech which may lead to miscommunication.



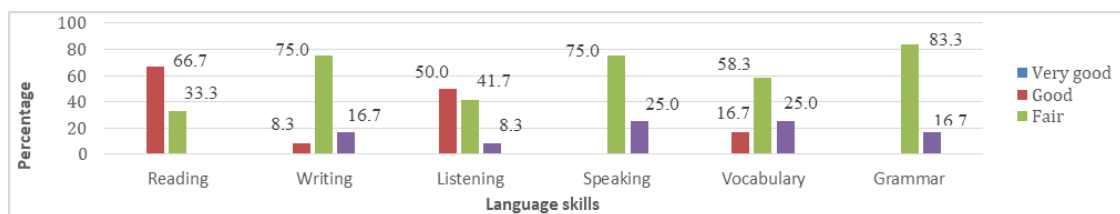


Figure 1: ELT lecturers' evaluation of the prospective teachers' general proficiency in English

As shown in the following graphs, a considerable number of prospective teachers have problems regarding fluency, accuracy, vocabulary and pronunciation of the target language.

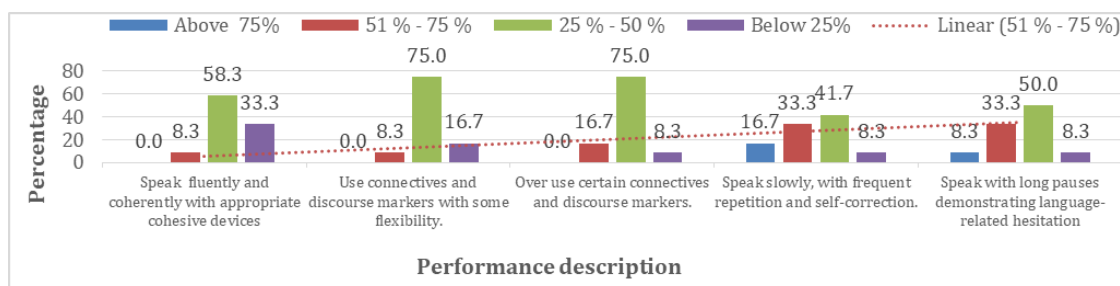


Figure 2: ELT lecturers' evaluation of the prospective teachers' fluency and coherence

The trend line indicates an increase in the majority of prospective teachers towards the descriptions of weaker performance related to fluency and coherence.

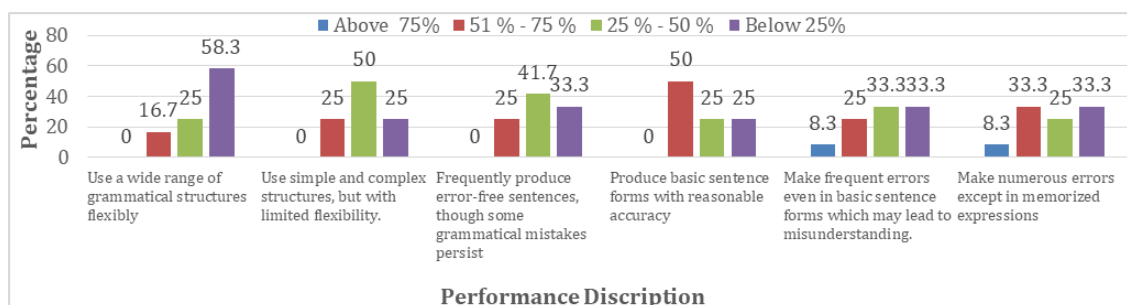


Figure 3: ELT lecturers' evaluation of the prospective teachers' accuracy of spoken language

In the interviews too almost all the ELT lecturers mentioned inadequate grammar knowledge, poor vocabulary, lack of fluency and issues in pronunciation as common problems hindering the prospective teachers' spoken proficiency.

According to the findings, 55.7 % of the prospective teachers were worried about the grammatical accuracy of what they speak and 40.1% had mentioned that spontaneous flow of words gets disturbed by their limited vocabulary. While 43.1% of them admitted that they are not fluent, 40.1 % had stated that they get stuck in the middle of conversations. More than 50% of the prospective teachers had stated that they were not confident to speak in English due to the above weaknesses and consequently they had developed anxiety, shyness and fear to speak in English.

Given below are the major deficiencies of the prospective teachers' speaking skills revealed

by themselves and the ELT lecturers in the questionnaires as well as in the interviews.

- Making frequent errors / mistakes in grammatical structures
- Poor / insufficient vocabulary and inability to choose the words appropriate to the context
- Lack of fluency and issues in pronunciation
- Anxiety, shyness, fear and lack of motivation to speak in English

According to questionnaire data, as the majority (70.1 %) had not been brought up in an English speaking social background, their exposure to the target language outside the school too had been very low. In the interviews too, prospective teachers and lecturers expressed that lack of attention given to the speaking skills by the English language teachers at the secondary level of schooling, lack of



exposure to the target language outside the school, lack of opportunities to use it etc. were the major causes of the observed deficiencies in speaking. According to their responses, inadequacy of grammar knowledge and vocabulary as well as lack of guidance and opportunities to use the target language had caused anxiety, fear, demotivation and lack of confidence in the prospective teachers towards speaking in English.

In the interviews, 75 % of the ELT lecturers had stated that the General English syllabus currently used in NCOEs does not cater to the language needs of the prospective English medium teachers. This was considered as a major obstacle for the prospective teachers of ICT to gain the language competence required to teach the assigned subjects in the English medium.

According to the findings, two of the NCOEs selected for the study conduct other English medium courses in addition to the ICT course; they have a sufficient number of lecturers to teach the Special and Professional subjects in English medium; and there are many schools in their catchment areas with English medium classes for the prospective teachers to practise teaching during the course of study. Consequently, they have had better exposure to the target language at the college and more opportunities to use it. Prospective teachers of the other NCOE stated that, though they had few English language development programmes at the NCOE, L1 had been used frequently to communicate with the other trainees, and they rarely got opportunities to teach in the English medium due to the non-availability of required number of schools with English medium classes in its catchment area. As a result, their exposure to the target language and opportunities to use it are comparatively lower.

These findings reiterate Krashen's Monitor Theory as well as Swain's Output Hypothesis. According to Krashen, 'People acquire second languages only if they obtain comprehensible input and if their affective filters are low enough to allow the input 'in'. (Krashen, 1985, p.4). Swain on the other hand emphasizes that language acquisition is promoted not only by receiving comprehensible input, but also through the opportunities provided to learners to produce the language.

## CONCLUSION

According to the questionnaire and interview data, internal and external factors given below have influenced the speaking proficiency of the prospective teachers.

- Psychological / affective factors (anxiety, fear, demotivation and lack of confidence)
- Linguistic factors (Inadequacy of grammar knowledge, poor vocabulary, lack of fluency, issues in pronunciation)
- Factors related to the ELT syllabus and teaching methodologies
- Factors related to the socio cultural background (lack of exposure, guidance and opportunities to use the target language)

Hence, it is necessary to take effective measures to elude the identified obstacles and develop the English speaking proficiency of the English medium prospective teachers by improving the pre-service teacher education programme conducted by NCOEs.

## REFERENCES

- Aslam HD. (2011). 'Analyzing Professional Development Practices for Teachers in Public Universities of Pakistan', *Mediterranean Journal of Social Sciences*, 2(4), 97–106.
- Balakrishnar J and Thanaraj T. (2011) *Instruction in the English medium: A Sri Lankan case study*.
- Cammarata L. (2010) 'Foreign Language Teachers' Struggle To Learn Content-Based Instruction', *L2 Journal*, 2, 1.
- Creswell J. (2012) *Educational Research: Planning, Conducting, And Evaluating Quantitative And Qualitative Research*. (4th edn.) Upper Saddle River, NJ: Pearson Education
- Gul S. and Aziz S. (2015) 'Teachers' Level of Proficiency in English Speaking as Medium of Instruction and Causes for English Speaking Deficiency', *Bulletin of Education and Research*.37,(1), 97-105
- Krashen S. (1985). *The input hypothesis: Issues and implications*. London: Longman.

Low E., Chong S., & Ellis M. (2014) 'Teachers' English Communication Skills: Using IELTS to measure competence of graduates from a Singaporean Teacher Education Program', Australian Journal of Teacher Education. 39(10).



## The Factors which Potentially Led to Victorian Duplexity in R.L.Stevenson's 'The Strange Case of Dr. Jekyll and Mr. Hyde' and Oscar Wilde's 'The Importance of Being Earnest'

Manouri K. Jayasinghe<sup>1\*</sup>

<sup>1</sup>Sri Lanka Institute of Information Technology, Sri Lanka

### ARTICLE INFO

#### Article History:

Received Date: 01 July 2022

Accepted Date: 15 September 2022

#### Keywords:

Victorian Literary period, Duality, Escapism, Moral hypocrisy

#### Citation:

Manouri K. Jayasinghe. (2022). *The Factors which Potentially Led to Victorian Duplexity in R.L.Stevenson's 'The Strange Case of Dr. Jekyll and Mr. Hyde' and Oscar Wilde's 'The Importance of Being Earnest'*. Proceedings of SLIIT International Conference on Advancements in Sciences and Humanities, (11) October, Colombo, 40 - 45.

### ABSTRACT

The treatment of the theme of duality, a distinctive feature of the Victorian period of literature and the possible reasons for it emerging at that time, are studied in this paper using R.L.Stevenson's *The Strange Case of Dr Jekyll and Mr Hyde* and Oscar Wilde's play *The Importance of Being Earnest*. The concept of duality derives from the Latin word duo, meaning two. It applies quite often to two elements, one different from the other and in opposition to each other. This theory being applied to men of the Victorian period, it unmasks the dual face of their behaviour demonstrated in the works concerned. One wonders whether this duality could have largely originated from their desire for escapism from societal norms or moral hypocrisy: a psychological phenomenon. To respond to these questions, an understanding of the Victorian period and also the story lines of the literary works are essential. The qualitative research approach used in the study enables a brief narrative analysis of the works which enlightens us on the plot and the characters. The issue as to whether Victorian societal duality results from the constraints brought about by the moral standards of society or the rapid changes sweeping across the population during that time is discussed here.

### INTRODUCTION

Duality deriving from the word dual which means two parts, quite often carries with it the

\*Manouri, manouri.j@slit.lk

connotation of two elements having opposite characteristics. This term duality could be applied to technical disciplines where it carries technical overtones and also to Theology, Psychology, Sociology, Art, Law, and even Literature. The latter being the field on which our focus will be laid, duality in literature is the state of a character having two faces, generally good and evil, which points to, two opposite elements in one personality. This feature of duality when exposed in a text, is of major importance to the development and the understanding of the working of a character, usually the protagonist which eventually helps in the advancement of the storyline. The literary works consisting of two different literary genres chosen for this research, contain this aspect of doubleness. The purpose of this paper is to study some possible reasons which led to the feature of duality, prominent in the literature of the Victorian period. For this purpose, a historical overview of the Victorian period which would allow an analysis of the societal structure, its traditions and norms is required. This background information would be helpful in explaining the premise on which my analysis is built upon.

## **METHODOLOGY**

The qualitative research method was used in analyzing R.L.Stevenson's *The Strange Case of Dr Jekyll and Mr Hyde*, and Oscar Wilde's play *The Importance of Being Earnest*. The use of this method could be justified because the type of data in this research is descriptive and consists of words, phrases, and sentences to be analyzed. The primary data source of this study is the text of the novel by Stevenson and Wilde's script of the play. Furthermore, the secondary data sources of this research paper are the reference books which include journals and critical works giving information on recent research findings concerning these works, electronic articles and forums which contribute to an enhancing of information on the topic of the research paper. Regarding data collection, the primary step was the interpretation of the works. First, skimming the texts and then scanning them and focusing on the important words, phrases, and sentences for a deeper comprehension. A subsequent narrative analysis done, allowed the story line to unfurl and the reader to understand the conduct of the characters and their contribution to the

plots of the works mentioned above. Once the respective protagonist of each work emerged, this character was analyzed in light of the concept of duality and the reasons for this type of conduct on his part. A societal and economic understanding of the Victorian period too was done in order to study how the concept of duality which was widespread during this era had permeated it.

## **Insight into the Victorian period – Economy and Society**

The Victorian era, in British history, dates approximately to the period between 1820 and 1914, which according to Susie Steinbach, corresponds roughly but not exactly to the period of Queen Victoria's reign (1837–1901) and was characterized by a class-based society and a democratic approach towards the citizens of the period where they had the opportunity to vote and choose their leaders. Concerning the State, it flourished by the day as it was seeing the positive after-effects of the Industrial revolution and consequently, a strong economy. Industrial development having played an important role in ship building, Britain at that period was also considered the most powerful empire in the world as its navigational prowess was at its best.

Despite Britain's wealth and powerful status, the irony was that three-fourths or more of its population belonged to the working-class. The job opportunities which factories offered, attracted rural folk to the capital and its suburbs in search of a living. This culminated in the working class swelling in numbers in the main towns. Steinbach states that 'class was both economic and cultural and encompassed income, occupation, education, family structure, sexual behaviour, politics, and leisure activities.' (2021) Furthermore, concerning the majority, which was the working class, Steinbach claims that its income totaled under £100 per annum. The middle class, made up of professionals, growing rapidly in numbers during the 19th century, earned around £1,000 annually. This group which was able to obtain some political power proclaimed themselves as the moral leaders of society. The extremely wealthy upper class, made its income which was much above £1,000 per annum from property, rent, and interest. They who never knew the hardships of life, owned much land in

the country and controlled local, national and international politics.

These income discrepancies in social classes led to the poor, living in squalid conditions, becoming poorer by the day on account of their increasing family numbers. This resulted in the lack of decent health conditions and the increasingly difficult access to medical facilities. The children of this lowest class in society were absorbed into child labour and the rules and regulations which barred women from working, led to quite a few unmarried women resorting to reviled methods of earning money. The rich thrived on this situation, child labour helped them improve their enterprises for a paltry sum. Males of the upper society, the pater familias with extensive power had not only the responsibility of protecting their families and providing for them but also the liberty of behaving as they fancied because the financial power was exclusively theirs.

Early agrarian societies required families to work together. This changed during the Victorian period which experienced a new lifestyle brought about by the industrial revolution where the factory, the shop or office came into existence thus clearly defining the men and the women's roles and workspaces. Men went out to make a living and women had the responsibility of the household chores and child raising. According to Kathryn Hughes (2014), this saw the light of day of the concept 'Separate Spheres'. "The ideology of Separate Spheres rested on a definition of the 'natural' characteristics of women and men. Women were considered physically weaker yet morally superior to men, which meant that they were best suited to the domestic sector. Not only was it their job to counterbalance the moral taint of the public sphere in which their husbands laboured all day, they were also preparing the next generation to carry on this way of life". During this time as young girls were expected to be accomplished and educated, the age for marriage was pushed back in society. As a result of late marriage becoming the standard, unmarried men who were expected to be chaste till marriage went against the sacred norms of Victorian morality and resorted to pre-marital liaisons, prostitution and consequently lying, in order to cover up their deeds. Thus, they commenced leading a dual life from an early age. Married men too, who had their individual liberty because of the new social structure, were able to resort to extra-

marital escapades. This tendency contributed to the concept of dual personalities seeing the light of day in the society of this era.

### **Duality in the works**

Freud in his essay the "The Uncanny" (1919) discusses duality stating that the creation of a double is a self-love, a sort of a primitive narcissism of safeguarding oneself and avoiding the destruction of the ego. Labriola (2002) in his article believes that through the psychological distance 'between the double and the self, the individual is able to evaluate his own behavior and to develop a conscience for his improvement. This means that once the critical stage of the Doppelgängertum has been reached, the double either provides the individual with the necessary impetus for a conscience or the double becomes the "uncanny herald of death." This is apparent in Stevenson's work.

In R.L.Stevenson's The Strange Case of Dr Jekyll and Mr Hyde, Mr Utterson uses third person narrative information to present the story with a first person perspective. Hence, the reader discovers the plot and understands the storyline from the information gathered by Utterson which in fact excludes his personal point of view. The same applies to Dr Lanyon who discloses the information of Dr Jekyll's last letter which is a confession to his dual personality. Dr Jekyll a respectable, intelligent medical doctor from the middle-class Victorian society is in quest of his alter ego; named by him as Hyde. He concocts a chemical potion which he uses at night for the purpose of transformation. The very title of the work hints the duality in the novel. From the inception, one understands that there are two characters namely Jekyll and Hyde. Jekyll, a gentleman to his fingertips and Hyde a deformed abominable creature. This idea is overturned towards the end of the novel when Dr Jekyll confesses "I was in no sense a hypocrite; both sides of me were in dead earnest; I was no more myself when I laid aside restraint and plunged in shame than when I laboured in the eye of the day, [...] I thus drew steadily nearer to the truth, [...] that man is not truly one, but truly two" (Stevenson,1985).

Duality is obvious in the names Jekyll and Hyde. The repetition of the letter 'Y' in the middle of the name could be that Jekyll finds a mirror image in Hyde. It could be stated that

Jekyll and Hyde succeed one another in time because the eminent doctor is Jekyll during the day and Hyde during night committing nefarious activities.

Concerning Wilde's play, *The Importance of Being Earnest*, duality is observed in almost all the male and female actors, but for the purpose of this paper, only the two leading male characters will be examined. The storyline and the plot of the play unfold through the conduct of the actors. Though a theatrical work, no chorus takes on the task of relating events and the audience and readers experience a third person point of view. Jack Worthing and Algernon Moncrieff or Algy, are in quest of an exciting life and invent fictitious doubles to get away from their daily responsibilities and obligations. Jack's invented brother is 'Ernest' and Ernest's imaginary misdeeds being frequent, Jack makes use of these instances of misbehaviour as an opportunity of going up to London from the countryside where his supposed brother lives. His pretext for travelling is to help his 'brother' overcome the scrapes he often falls into. Ernest is Jack's alibi in London, and this helps him to indulge in all irrational pleasures he seemingly disapproves of, as regards his nonexistent brother. He uses Ernest, both as an excuse and a conceal to keep his respectable image undamaged. In London he is housed by his confidant Moncrieff an aristocrat who takes on the name of 'Ernest' because he wishes to see Cecily Cardew, Jack's ward who has vowed to marry only any man carrying the name 'Ernest'. "In order that I can go down into the country whenever I choose" is the excuse given by Algy to invent an imaginary invalid called Bunbury who presumably lives there and apparently needs his help constantly because of his poor physical condition. Ernest is Algy's alter ego and Bunbury is his alibi. Duality is rife in this play and Wilde satirizes the 'faux masks' worn by the cultured people of the Victorian society. The idea of each personality having two names alone brings out the idea of a dual identity which permits these two friends to lead double lives when they wish to do so. Just like in Stevenson's *The Strange Case of Dr Jekyll and Mr Hyde* in Wilde's play, *The Importance of Being Earnest* too, at the end it is discovered that the alter ego and the respective character are one and the same. The only difference being that unlike in the novel the play does not end on a tragical note.

## DISCUSSION

Dualism being obvious in the two works, one wonders whether a psychological reason or a societal influence or both could explain it.

Looking for the reasons which cause duality, research has attributed the hypocrisy of the Victorian period as being a possible reason. Hypocrisy is a term which explains the behaviour of people from time immemorial. Many reasons have been attributed to this type of conduct which is very prominent in Victorian literature. Hence, the term hypocrisy or in other words feigning, quite often takes place in respect to others and at times even to oneself. Religious beliefs, political convictions, and moral behavioral norms are a few among the many reasons which could create this fake conduct in people. The causes of hypocrisy should be narrowed down with more precision in order to be applied to the Victorian society. Concerning the 19th century, it is the moral beliefs that seemed to have created this phenomenon – Moral hypocrisy. Victorian morals being very rigid owing to the mental and physical transformational process taking place in the society of that period, people who yearned for more liberty resorted to methods of breaking away from norms and yet continuing in the circuit of respectability. A desire for escapism too seems to surface in this process.

Webster's Desk Dictionary of the English Language (1990) defines moral as being "concerned with principles of right or wrong conduct and being in accordance with such principles" (p. 586); and it goes on to characterize hypocrisy as "a pretense of having desirable or publicly approved attitudes, beliefs, principles, etc., that one does not actually possess" (p 444). Tong and Yang (2010) explain that Moral hypocrisy occurs when a person explicitly endorses a moral standard and yet behaves in violation of it. This is obvious in the presented works.

Regarding escapism being a catalyst for duality, Kalia (2021) in her research paper states that "Psychologist Sigmund Freud opined that a vial of escapism is a necessary element in life and that humans "cannot subsist on the scanty satisfaction they can extort from reality." Hence, escapism too could be used to explain the dualistic behaviour of the characters in the works chosen for this study.

Taking the case of Dr Jekyll, presented as a very decent member of the middle-class Victorian society, one observes that he has impulses so strong against following moral norms that he creates an Alter Ego in the Freudian concept and crystalizes his wickedness in him. Dr Jekyll admits that Edward Hyde was “a second form and countenance substituted, none the less natural to me because they were the expression, and bore the stamp, of lower elements in my soul”. At this point one wonders whether the desire for escapism plays a role in Dr Jekyll’s life. Mighail (2003) is of opinion that the “release from the constraints of social conformity, ... [permits] Jekyll himself to still walk the path of righteousness”. Kalia (2021) states that “at the most basic level, escapism is understood as an effort to evade awareness of oneself, one’s beliefs, or the immediate reality that is often disquieting in nature. The psychology of escapism takes into account an important consideration: the desire to escape may be a response to a stimulus, like stress, danger, or adversity, but it also could be a calculated response to emotional survival”. Therefore, this single character having two personalities could be a plea for evasion from moral norms.

Algernon and Jack invent a second fictitious self in Wilde’s play *The Importance of Being Earnest*. They clearly admit to escapism being their motive of this doppelganger invention. Jack confesses the reason, “When one is placed in the position of guardian, one has to adopt a very high moral tone on all subjects. It’s one’s duty to do so. And as a high moral tone can hardly be said to conduce very much to either one’s health or one’s happiness, in order to get up to town I have always pretended to have a younger brother of the name of Ernest, who lives in the Albany,” (Wilde, 15) He indulges in uncanny behaviour when in town and hypocritically returns to his ethical conduct when he returns to the countryside. Hence, Moral hypocrisy occurs. Likewise, Algernon reveals “I have invented an invaluable permanent invalid called Bunbury, in order that I may be able to go down into the country whenever I choose. Bunbury is perfectly invaluable. If it wasn’t for Bunbury’s extraordinary bad health, for instance, I wouldn’t be able to dine with you at Willis’s to-night,” (Wilde, 16) On the pretext of visiting a patient, Algernon enjoys himself with his friend.

A straightforward instance of Moral hypocrisy as he has lied to escape from his commitments.

## CONCLUSION

In this paper, the dualistic themes in R.L.Stevenson’s *The Strange Case of Dr Jekyll and Mr Hyde* and Oscar Wilde’s play *The Importance of Being Earnest* have been explored. The main emphasis of this article is to search for some of the possible causes which led to this type of behaviour during the Victorian literary period. Following a brief presentation of the economic and social condition of the Victorian period, the above-mentioned works of the writers Stevenson and Wilde, have been analysed and the result clearly point out that the desire for duality, or to say it differently, a two faceted personality in Victorian society was the result of the weighty moral norms inherited from the social and religious movements of the Georgian period which preceded the Victorian era. People were so frustrated with societal rules that their greatest desire was to escape from it. The new ideas on the evolution of man, presented by Darwin too, shook the very foundations of religious beliefs and resulted in a new psychological approach - moral hypocrisy which was practiced in society in order to break away from imposed social responsibilities and lead a life which pleased the individual with little concern about the social norms of the society they lived in.

## REFERENCES

- Stevenson, R.L. (1985) *The Strange Case of Dr Jekyll and Mr Hyde*. New York, Bantam Classics 1985.
- Wilde, O. *The Importance of Being Earnest*. <https://www.fulltextarchive.com/pdfs/The-Importance-of-Being-Earnest.pdf>
- Batson, C. D., & Thompson, E. R. (2001). Why don’t moral people act morally? Motivational considerations. *Current Directions in Psychological Science*, 10, 54-57.
- Freud, S. “The Uncanny” (1919) First published in *Imago*, Bd. V., 1919; reprinted in *Sammlung, Fünfte Folge*. [Translated by Alix Strachey.]

- Henry A. Pochmann, German Culture in America: Philosophical and Literary Influences, 1600-1900. (1957; rpt. Westport, CT: Greenwood, 1978) 367-81.
- Hughes, K. (2014). Gender roles in the 19th century. Discovering Literature: Romantics and Victorians, Newsletter British Library.
- Kalia, S (2021). Escapism Is a Way to Cope Under Stress. But It Can Also Become a Tool for Self Deception, retrieved from <https://theswaddle.com>
- Labriola, P. (2002). Edgar Allan Poe and E. T. A. Hoffmann: The Double in "William Wilson" and The Devil's Elixirs, Vol 29.
- Mighall, Robert. Introduction. The Picture of Dorian Gray. By Oscar Wilde. London: Penguin Classics, 2003. ix-xxix. Print
- Rieber R.W. (2002). The duality of the brain and the multiplicity of minds: Can you have it both ways? *Hist Psychiatry* 2002; 13:3-17
- Singh, S.M. & Chakrabarti S. A study in dualism: The strange case of Dr. Jekyll and Mr. Hyde. retrieved from *Indian Journal of Psychiatry* (lww.com) 50(3), Jul-Sep 2008
- Steinbach, S. (2021) "Victorian era". *Encyclopedia Britannica*, 12 Mar. 2021, <https://www.britannica.com/event/Victorian-era>.
- Tong, E.M.W & Yang, Z. (2010) Moral Hypocrisy: Of Proud and Grateful People. <https://doi.org/10.1177/1948550610385711>
- Wendel A.T. (2012) Narration in Robert Louis Stevenson's "The Strange Case of Dr. Jekyll and Mr. Hyde", Munich, GRIN Verlag.





## To Leave or not to Leave: Attitudes of the Undergraduates towards Speaking in an Online ESL Classroom

Ashani Erandi Peiris<sup>1\*</sup>

<sup>1</sup>English Language Teaching Unit, Faculty of Humanities and Sciences, Sri Lanka Institute of Information Technology (SLIIT), Malabe, Sri Lanka

### ARTICLE INFO

#### Article History:

Received Date: 01 July 2022

Accepted Date: 15 September 2022

#### Keywords:

Leave, online ESL lectures, Speaking, attitude, factors

#### Citation:

Ashani Erandi Peiris. (2022). *To Leave or not to Leave: Attitudes of the Undergraduates towards Speaking in an Online ESL Classroom*. Proceedings of SLIIT International Conference on Advancements in Sciences and Humanities, (11) October, Colombo, 46 - 50.

### ABSTRACT

Covid 19 pandemic has affected all sectors in Sri Lanka including education. Online delivery mode was integrated into tertiary education in most of the universities to meet the new challenges. Facilitators of the English as a second language (ESL) classes use effective strategies and platforms to improve English language(L2) proficiency of the students. Improving speaking of the learners in such online ESL classes is challenging. ESL facilitator commonly experienced that some students leave the meeting when they are assigned to do a group activity or a speaking activity. Hence, it is vital to study the attitudes of the students towards speaking in an online class to help them improve speaking. A questionnaire was distributed among the first year, first and second semester students in a non-state university, and one hundred twenty-eight responses were collected. The results of the quantitative data were analysed using the percentages of the responses. As revealed, the main reason to avoid ESL lectures is irregular power cuts. On the other hand, the learners have not clearly identified the importance of L2 speaking. The majority use L2 only for oral exams/ assignments, and some prefer the recording. The decision to leave the online lecture when there are speaking activities is rooted mainly from psychological factors, and then secondly from linguistics factors. With proper guidance the students may change their attitudes towards L2 speaking, and their

\*Ashani, ashani.p@slit.lk

decision to leave the online lecture would be less.

## INTRODUCTION

English, which is an international language, plays a vital role in the sphere of education. In Sri Lanka, teaching/ learning English commences from the primary education and continues till the tertiary education. One of the key objectives of teaching English is communication (Torky,2006). Despite the number of years of learning English (L2), facilitators and learners both face challenges in teaching and learning speaking skills, and with Covid- 19, they were confronted with new challenges (Mridul et al.,2021; Haththotuwa & Rupasingha,2021). As experienced, one of the challenges faced by the facilitators is getting the students to take part actively in online sessions. Since there is no technical procedure to control their 'join' or 'leave' option in a meeting, this has become a major barrier in an ESL classroom when trying to engage them in speaking activities. Hence as facilitators, it is important to explore methods to improve speaking in an online lecture by identifying the attitudes of the learners towards L2 English speaking.

According to Purwanti and Yeni (2021), speaking is one of the most important aspects in learning, and the success of a learner can be measured through the learner's ability to communicate in the target language. This highlights the prominence a learner should give to improve speaking skills. The students should realize that to improve a productive skill like speaking, they must practice it. Unfortunately, due to many reasons, students do not pay much attention to speaking. Ur (1996) has discussed some issues faced by students in speaking activities. Inhibition, lack of theme to discuss, lack of participation and the use of mother tongue. According to Leong and Ahmadi (1997), these factors have a major impact on the performance of the students in speaking activities. They feel less self- confident and less comfortable. Despite their linguistic abilities, the low self-esteem, higher anxiety, and low motivation of the students effect their speaking performance negatively. According to Krashen's (1988) affective filter hypothesis, learners with low self-esteem, high level of anxiety form a mental block and do not do well.

During physical lectures, students opt to remain silent. Survey interprets silence as the

absence of vocalization where students restrain from answering the question/s (Bosacki,2005; Juniati,2018). Nugroho (2017) discusses three factors which influence silence in a speaking class: psychological factors, linguistic factors, and socio-cultural factors. According to Juniati (2018), using group activities, encouraging the students to write the answer before speaking, asking students to speak on a certain topic directly are some strategies which can be used in the classroom. This is achievable during the physical lectures because the learners are with the facilitator. When it comes to online teaching, the facilitators are faced with a different challenge. As experienced, some students stay silent, and usually students simply leave the meeting since the "leave the meeting" option from an online session cannot be controlled from the facilitators end. As suggested by Edlund (2020), the facilitators have a major role to play in improving the speaking skills of students in an online session. They must pay close attention to the course design, the materials, exercises, homework. Hence, before applying these strategies, it is vital to understand the attitudes of the undergraduates towards speaking during an online class to help them better. Thus, the objectives of this research are to investigate the attitudes of the students towards speaking during an online ESL classroom and to find out the factors which influence their performance during lectures to help the students perform better.

## MATERIALS AND METHODS

A quantitative survey research design was used to find out the attitudes of the students towards speaking during an online ESL classroom. The data collection tool for the study was the questionnaire designed using an online survey tool. The questionnaire was distributed among the first year, first and second semester students of a non-state university in Sri Lanka, and one hundred and twenty-eight responses were collected. Due to covid, online lectures for these students starting from the intensive to their academic semesters. Everyone in the sample group has more than twenty weeks experience in participating online lectures. It was distributed among students using the social media platform, WhatsApp, and the questionnaire

was opened for responses for five days. The questionnaire consisted of 11 questions: one yes/no, six multiple-choice, three Likert-scale, and one open-ended question which were about the respondents' contribution during the online English lectures. The collected data were analyzed quantitatively through spreadsheet tools, and charts were designed to conclude the attitudes of the students towards speaking in an online ESL classroom.

## RESULTS AND DISCUSSION

The results of the quantitative data were analyzed using the percentages of the responses. Initially, the participation of the students for online lectures was investigated.

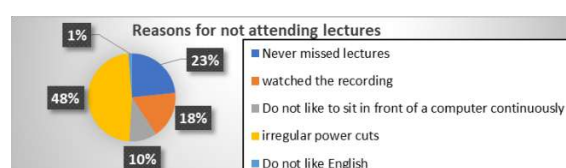


Figure 1: Reasons for not attending lectures

In figure 01, students have been asked the reasons for not regularly attending online lectures. Accordingly, majority has said it was due to irregular power cuts. Due to the economic crisis Sri Lanka is experiencing daily power cuts, and as the findings revealed that this is one of the main reasons students have suggested for not attending lectures daily. This highlights how an economic crisis of a country negatively effects the education system. After the online lecture, the recording of the lecture is made available for the students on the Learning Management System (LMS), and 18% of the students have said that they prefer recorded sessions. Unfortunately, by just listening to a recorded session, the objective of learning English: communication, cannot be achieved. Data also highlights that only 23% students from the sample group have attended online lectures and others have not attended due to many reasons. Interestingly, when they were asked whether they know the importance of learning English 99% said that they are aware of it, and a small minority thinks it is just to pass the module. The researcher wanted to find out the use of English in the sample group, and the students were asked how often they use English to communicate.

Table 1: Use of L1

	Number of students	Percentage
<b>I never speak in English</b>	13	53%
<b>When I do oral exams/ assignments</b>	101	7%
<b>On social media</b>	62	32%
<b>I usually talk to my parents and friends in English</b>	15	8%
<b>My first language is English</b>	1	0%
<b>Other</b>		

As indicated, a significant majority is not using L2 in their daily life. Only 8% are using L2 in their daily life. This highlights the importance of actively taking part in online L2 lectures because the students lack exposure to L2 speaking. However, when asked whether they take part in a discussion/ or speak during the English lectures, only 8% said they always do, 59% said sometimes, especially when the lecturer calls out their names, and 33% have rarely or never actively taken part in L2 lectures. These students simply use the leave option. They do not have understood the importance of L2 speaking even though, majority thinks they know the value of L2 speaking. Then they were asked the reasons for not voluntarily speaking or leaving online English lectures. The given options were categorized into psychological factors, linguistic factors, socio- cultural and technological factors.

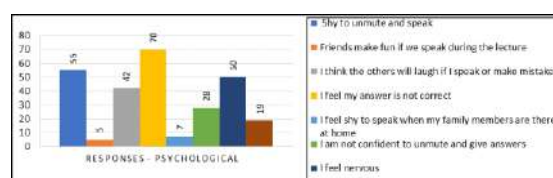


Figure 2: Responses Psychological

Figure 02 analyses the number of students who have selected the above reasons. As can be seen, the highest number of students think their answer is incorrect. The other two highest reasons are they are shy to unmute and speak, and they are nervous. They are also concerned about the opinion of the others who think their friends would laugh if they spoke or made mistakes because 42 have chosen this reason for not voluntarily speaking or leaving the

lectures. The responses given by the students included linguistic factors as well.

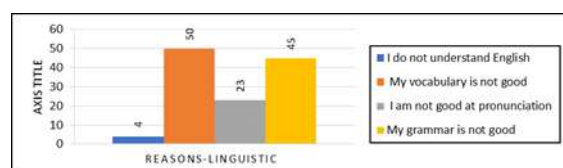


Figure 3: Responses – Linguistics

Figure 03 discusses the number of students who have selected linguistic factors. Majority of the students contribute less or leave because their vocabulary is not good. The second factor according to them is grammar. Least number of students say they do not understand English.

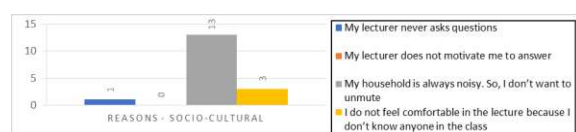


Figure 4: Responses socio-cultural

Figure 04 shows the responses students have selected under socio-cultural factors. Most of the students have selected the disturbances in their household as a reason for not voluntarily speaking or leaving online lectures, and the facilitator's teaching style is the least selected.

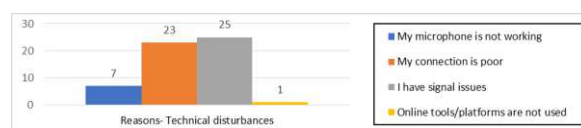


Figure 5: Responses technical

When online lectures are conducted, technical factors can also be a barrier for their active participation as can be seen in figure 04. Almost half of the students undergo technical difficulties. Hence, they have not taken part actively or left online lectures.

After analysing all the factors, main factors which hinder their active participation or the decision to leave the meeting were found. A significant majority feels their answer is incorrect. The next mostly chosen reasons indicate that they are shy, nervous, and their grammar and vocabulary are not good. Least selected reasons are less teacher motivation, less online platform or interesting activities to encourage speaking, and feeling uncomfortable in the lecture since they have hardly met their friends due to covid.

## CONCLUSION

Based on the findings, the researcher arrived at three final conclusions. Initially, it was revealed that irregular power cuts were the main barrier for the poor attendance in online lectures regularly. Higher authorities should pay much prominence to the infrastructure of a country which has become a hindrance in improving L2 speaking. Secondly, it can be concluded that the use of L2 among undergraduates is not at a satisfactory level during their tertiary education. Most students use L2 only for exam purposes. Even though a significant majority says they know the importance of L2 speaking, their responses contradict that. The facilitators have greater responsibility in changing this attitude of the students and make them understand the importance of actively taking part in online ESL classrooms. Finally, the decision to leave the online lecture when there are speaking activities is rooted from many factors. As found, more than the technical issues, the psychological factors are the most dominant factors which make them leave or participate less in online lectures, next is linguistics factors. Hence the awareness of these factors would assist the facilitator to give more psychological guidance to the students while designing online activities to improve their linguistics difficulties.

## ACKNOWLEDGEMENT

I would like to extend my gratitude to the participants of my research, and SLIIT for giving this opportunity.

## REFERENCES

- Torky S. (2006). The Effectiveness of a Task-Based Instruction Program in Developing the English Language Speaking Skills of Secondary Stage Students [Unpublished doctoral dissertation]. Ain Shams University Women's college.
- Mridul, Bisht B.; Sharma D.; Kaur N.(2021) Online classes during COVID-19 pandemic: Anxiety, stress & Depression among University students. Indian Journal of Forensic Medicine & Toxicology.

Haththotuwa P., & Rupasinghe R. (2021). Adapting to Online Learning in Higher

Education System during the Covid-19 Pandemic: A Case Study of Universities in Sri Lanka. *Sri Lanka Journal of Social Sciences and Humanities*, 1(2), 147.

Urwanti S., & Yeni M. (2021). Students' silence in speaking class: factors and solutions. *Wiralodra English Journal*, 5(1), 10-19.

Ur P. (1996). *A Course in Language Teaching Training Foreign Language Teachers - A reflective approach*. In *Cambridge Teacher Training and Development*. Cambridge University Press

Leong L., & Ahmadi S. (2017). An Analysis of Factors Influencing Learners' English Speaking Skill. *International Journal of Research In English Education*, 2(1), 34-41.

Krashen, Stephen D. (1988). *Second Language Acquisition and Second Language Learning*. Prentice-Hall International.

Bosacki S. L. (2005). *The culture of classroom silence*. Peter Lang Publishing, Inc.

Nugroho P. (2017). Factors affecting the students' reluctance to speak English in classroom interaction. Juniati, S. R. (2018). *STUDENTS'SILENCE IN THE EFL SPEAKING CLASSROOM* (Doctoral dissertation, UNIVERSITAS NEGERI MAKASSAR).

Edlund F. (2021). *The Importance of Speaking and Interacting in Online Teaching for Secondary School* (Dissertation).



## Online vs Face to Face: Perspective of Undergraduates on Learning English Literature at a Private University

Rajapakse R.W.D.N.K.<sup>1\*</sup>

<sup>1\*</sup>English Language Teaching Unit, Faculty of Humanities & Sciences, SLIIT, Malabe, Sri Lanka

### ARTICLE INFO

#### Article History:

Received Date: 01 July 2022

Accepted Date: 15 September 2022

#### Keywords:

Online; perspective; undergraduate; literature; pandemic

#### Citation:

Rajapakse R.W.D.N.K. (2022). *Online vs Face to Face: Perspective of Undergraduates on Learning English Literature at a Private University*. Proceedings of SLIIT International Conference on Advancements in Sciences and Humanities, (11) October, Colombo, 51 - 55.

### ABSTRACT

Since 2020, with the spread of the pandemic, the face-to-face teaching mode transformed into online mode with no other alternative. With regard to the tertiary level, all courses which were offered physically had to be adopted to the novel approach making both teaching and learning challenging. The present study examines learners' viewpoint and what they have experienced so far in learning literature online during the pandemic. Consequently, the study provides an insight into the prevalent teaching mode and explores effective strategies followed using the appropriate pedagogical online tools or platforms, when adopting the literary content for diverse learning styles, and student engagement synchronously and asynchronously. The study involves undergraduates at a private university following their Bachelor of Education in English. These students enrolled to a physical learning mode though the pandemic has made them into learning online. Thus, the study compares their views on learning physically and online. Due to the closure of the university, both qualitative and quantitative data are gathered via an online questionnaire with the due consent of the participants. The findings indicate learning literature online is more effective compared to the traditional face to face learning mode. The results indicate that online learning enhances learners' study skills, stimulates, and facilitates their interest in learning, which transforms learning into a

\*Rajapakse, navodya.r@sliit.lk



collaborative experience.

## INTRODUCTION

The epidemic of the virus affected the education system since 2020 resulting the closure of all schools and universities worldwide to curb the spread of the disease, transforming the delivery to online mode unconditionally. As reported by UNESCO, the education of many youths in the world, regardless of the discipline, has been hindered due to the pandemic (2020). One of the main reasons for this is the inability in purchasing the relevant equipment for a smooth virtual experience. When teaching and learning literature, there has to be teacher student interaction and the physical presence of the teacher (Schott et al. ,2003). Thus, it is essential that online learning provides teacher student interaction as well as student engagement, which stimulates the learning process (Schott et al. ,2003). On the other hand, it might be challenging for the teacher to maintain this interaction and engagement in a distant mode of education, where there is only a screen and a microphone. In fact, one of the reasons could be because of the novelty of this approach to teaching online which is abrupt to many teachers worldwide, especially when online learning was not similar to the physical mode of teaching (Calvert, 2001). With this inadequacy in experience, the teaching might be negatively affected during the first few months and gradually this would change with the learning styles as well (Angelina, 2002). When teaching literature, discussion between the teacher and the students are essential which is quite challenging in online delivery. On the other hand, the teacher's facial expressions, hand gestures and posture are more crucial than a teacher in the physical literature classroom (Meyer, 2003), which is rather challenging to be practiced online. As Wong (2007) has mentioned avoiding observing the emotions of learners might thwart teachers from replying to students' requirements. Thus, the present study, having its major focus to examine the traditional delivery of literature prevailed prior to the pandemic and the novel approaches followed in online delivery, tries to achieve following objectives:

1. To examine the usage of what resources are used when learning literature online at the selected institute

2. To identify how teacher-student and peer interaction are incorporated into online learning of literature at the selected institute

3. To analyze the difference in assessing learning on-site and online

4. To examine whether the ILOs of the curriculum designed for onsite delivery match with the online mode

## MATERIALS AND METHODS

The permission to conduct the study was obtained from the Faculty of Graduate Studies at the selected institute. Due to the gap identified in literature evaluation on online delivery of English literature at the Sri Lankan tertiary level education, the researcher aimed to address the gap by initially examining the delivery of the said discipline at the institute where the researcher teaches, so that the findings can be utilized in expanding the research area to the other universities as well. Hence this was a purposive sampling.

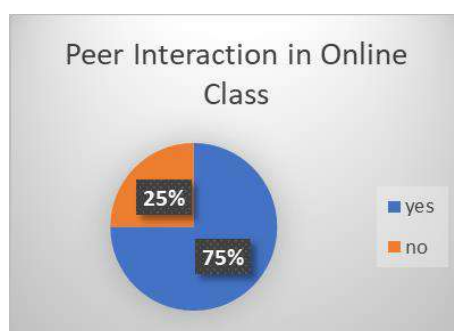
A noteworthy fact is that all the students enrolled to the selected Degree program were females. The research participants consisted of 25 undergraduates who follow a B.Ed degree in English in a private university in Sri Lanka. The sample was a purposive sample, which represents students from all years since they follow the same Degree program and courses. The research was mixed method which collected both quantitative and qualitative data in order to examine diverse opinions. The questionnaire consisted of nineteen questions both open and close ended, which allowed the participants to elaborate their viewpoint on the research topic. Since the data collection took place online, the link to the questionnaire was emailed and one week was given for the data submission. The results obtained were then analyzed via figures and text-based evaluations were conducted.

## RESULTS AND DISCUSSION


### Usage of Online Resources

As per the data, the majority mentions that literature is taught online mostly 'using videos'; taken mainly from YouTube and Jam Boards. From them videos are much preferred since the learning becomes 'interesting and easier'. Furthermore, this interest is further taken to the next level of successful academic performance with the usage of online social

Reason	Percentage of Respondents
Live Performance of plays	10.5
Watch recordings and clips of live performances	10.0
Online streaming performance	9.5
Experiences of festival (travel, food, etc.)	8.5
Autographs, meet and greet, etc.	4.5
Other	4.0



## Change of Assessment Strategies in Online and Face to Face Learning



Response	Percentage
Yes	80%
No	20%





poetic stanzas, personal opinions/interpretation of the work based on experience, presentations, research, and mind maps.’ Some students have justified their preference for online assessments since they are ‘easy, manageable, convenient, instead of travelling or staying at a boarding house to go to university’. As presented in Figure 06, these online assessments are conducted mostly as group tasks. When learners interact cooperatively together, they can showcase their perspective to each other, and this will make everyone arrive at a comprehensive understanding (Miller and Redman 2010).

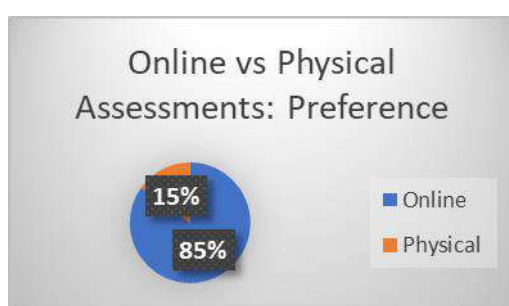


Figure 05

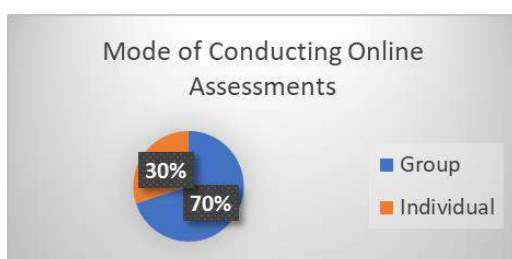


Figure 06

### Shift from Physical to Online Learning

More than half of the research participants have opted for online learning since they consider it to be more effective for student engagement, because during online learning students are given the opportunity to ‘state their opinion.’ Another response states that online lessons are ‘easygoing and feel less anxious to answer questions and engage in the lesson.’ Moreover, they consider physical lectures as ‘stressful and exhausting due to external reasons like traveling, time management, lecture hall issues etc.’ The sudden shift to online teaching has been effective and the ‘skills of the teachers in adapting to the teaching method and activities’ have helped in making the students’ ‘adaptation easier and it has been more rewarding.’ Some students have also provided reasons mentioning how ‘online teaching

teaches so many things and at the same time challenges to be technically literate.’ When learning online, there is synchronous and asynchronous learning, and the teacher has to stimulate interactivity through asynchronous and synchronous transmission or delivery (Ku et al. 2011; Lawton et al. 2012). As per the present study, regarding learning literature online, synchronous learning is considered as more effective and interactive. Synchronous communication relies on scheduled lectures and allows issues to be directly addressed via the educational method (Ku et al. 2011).

### CONCLUSION

After evaluating the responses given, it is evident that majority of the students prefer learning literature online. As the key findings of the study, resources, such as Breakout Room, Padlet, Jam Board and Youtube, are mostly used when teaching literature online, which is further facilitated by maintaining a ‘very engaging online presence’. Thus, the participants have teacher-student and peer interaction, which is emphasized in the study conducted by York et al. (2007), according to which, having student interaction in class is essential. When assessing literature online, students prefer online assessments, mostly quizzes, when they are conducted in groups, because they are ‘easy, manageable, convenient when studying at home instead of travelling or staying at a boarding house to go to university’. Overall, students accept the change and have adopted themselves to the novel mode of learning and prefer online learning more when it is conducted synchronously. Thus, it was revealed that the learning outcomes are achieved in online learning since the ‘skills of the teachers in adapting to the teaching method and activities’ have helped in making the students’ ‘adaptation easier and it has been more rewarding.’ However, the findings of the study could be validated by using a diversified sample of participants in the future studies.

### ACKNOWLEDGEMENT

First and foremost, our sincere gratitude is bestowed to the Faculty of Graduate Studies at the selected Higher Educational Institute for permitting to conduct the study with the selected undergraduates.

## REFERENCES

- Mehrpouyan A. and Zakeri E., (2021). Approaches Using Social Media Platforms for Teaching English Literature Online. *European Journal of Language and Literature*, [online] 7(2), p.34.
- Schott et al., (2003). Innovations in Distance Learning Program Development and Delivery [Review of Innovations in Distance Learning Program Development and Delivery]. *Online Journal of Distance Learning Administration*, 06(02).
- Calvert J., (2001). Deakin University: Going online at a Dual Mode University. *The International Review of Research in Open and Distributed Learning*, 1(2).
- Angelina P., (2002). Local initiatives in e-learning. *The Star Tech Plus*. 11.
- Wong J. J. (2007). Traditional Versus Hybrid Courses. *The International Journal of Learning: Annual Review*, 12(8), 163–170.
- Mehrpouyan A. ., & Zakeri E. . (2021). Virtual Education in English Literature Courses during Pandemic COVID-19: Merits and Demerits, and Needs. *Journal of Critical Studies in Language and Literature*, 3(1), 41-46.
- Moore M. (1989). Distance education theory. *The American Journal of Distance Education*, 5(3), 1–6.
- York C., Yang D., Dark M. (2007). Transitioning from face-to-face to online instruction: how to increase presence and cognitive/social interaction in an online information security risk assessment class. *International Journal of Information and Communication Technology Education*, 3(2), 42–52
- Miller, ST, & Redman, SL. (2010). Enhancing student performance in an online introductory astronomy course with video demonstrations. *Astronomy Education Review*, 9(1).
- Ku, HY, Heng-Yu, K, Akarasriworn, C, Glassmeyer, DM, Mendoza, B, Rice, LA. (2011). Teaching an online graduate mathematics education course for inservice mathematics teachers. *Quarterly Review of Distance Education*, 12(2), 135–147.
- Lawton D, Vye N, Bransford J, Sanders E, Richey M, French D, Stephens R. (2012). Online learning based on essential concepts and formative assessment. *Journal of Engineering Education*, 101(2), 244–287.



## A Study of L2 Motivational Self System: A Comparison between First Year Students Following Engineering Local and Foreign Degrees in a Non-State Campus

Gunawardhana D.R.<sup>1\*</sup>

<sup>1</sup>Sri Lanka Institute of Information Technology, Malabe

### ARTICLE INFO

#### Article History:

Received Date: 01 July 2022

Accepted Date: 15 September 2022

#### Keywords:

L2 motivation; Ideal L2 self; L2 learning experience

#### Citation:

Gunawardhana D.R. (2022). *A Study of L2 Motivational Self System: A Comparison between First Year Students Following Engineering Local and Foreign Degrees in a Non-State Campus*. Proceedings of SLIIT International Conference on Advancements in Sciences and Humanities, (11) October, Colombo, 56 - 60.

### ABSTRACT

L2 motivation is vital to enhance L2 learning experience of L2 learners. The L2 Motivational Self System can be considered as one innovative solution through research advocating possible selves that act as future guides to motivate learners to improve their language fluency to that of an ideal fluent speaker. There is inadequate L2 motivational self-system research conducted in non-state institutes of higher education in Lankan context. Hence, the present research was administered to evaluate the L2 motivational self-system comprising of Ideal L2 self, Ought-to L2 self, and L2 Learning experience among first-year students following local and foreign engineering degree programs offered in a non-state institute of higher education. The hypothesis for the present study is whether there is a significant difference in the Ideal L2 self, Ought-to L2 self, and L2 Learning Experience for first-year students following the engineering local and foreign degree programs. The sample selected was 62 students following foreign degrees and 212 students following local engineering degree programs. A questionnaire with 40 statements to test the 3 components of the theory was given to students following local and foreign engineering degrees. The data were evaluated with the 2 sample T-test. It was found that all 3 components of the L2 motivational self-system have significant values. In conclusion, students following the foreign degree programs have

\*Gunawardhana, randhula.g@slit.lk

higher ideal L2 selves than those following local degree programs.

## INTRODUCTION

Studying L2 motivation to enhance English learning as Second Language Acquisition (SLA) can be considered one of the most innovative solutions through research. L2 motivation is always considered one of the most significant internal reasons for language learning (Ushida & Dörnyei, 2012). Studying ways to increase learner motivation through innovative methods can help the learner acquire any new second language or foreign language successfully.

The creation of the L2 motivational self-system has been the result of many preceding motivational theories. Firstly, Gardner's (1985) socio-educational model is significant in L2 motivation research which Gardner explains as a collection of effort, desire to master the language and positive attitudes to learn the language. Csizér and Dörnyei (2005a) identify the ideal self with the term integrativeness. Markus and Nurius (1986) presents the theory of possible selves where an individual self is between how one views oneself to future actions. The possible selves' concept refers to the unrealized resources and skills such as beliefs and aspirations one has to have for one's future's yet to be realized desires. Markus and Nurius' (1986) possible selves present 2 types of 'positive' selves: ideal L2 where one has inner wishes and aspirations and the other type is Ought-to-L2 where one has many external obligations. It seems that these possible selves can direct the L2 learner to direct/guide oneself in the future to motivate oneself in learning. Markus and Nurius (1986) presents another L2 self which is a 'negative' L2 self which motivates oneself to achieve one's goals with fear of failure. Csizér & Dörnyei (2005b) proposes a new model of L2 learner motivation called L2 Motivational Self System that consists of 3 key components: the Ideal L2 self, the ought-to-L2 self and the L2 Learning experience. The Ideal L2 self is the fluent L2 speaker that the L2 learner dreams of being one day whereas the Ought-to L2 self is the one L2 learner assumes to be due to external reasons such as social expectations (Martinović, 2018). According to Martinović (2018), the first two components may have been derived due to the model of possible selves and the L2 learning experience could have been influenced by different

external factors such as teacher, curriculum, class learning experience etc. whereas at the same time, the L2 learning experience may have been affected by L2 motivation.

There have been a few studies related to the L2 motivational self-system or possible selves in Lankan context. Two of them are explained as follows: the first, a study by De Silva (2020) which has been conducted among 19 undergraduates in a state university studying Japanese as a foreign language has found that the undergraduates following Japanese as a foreign language have a mixture of Ideal L2 self and feared L2 self when they want to excel in Japanese. A study by Prasangani (2018) describes testing L2 Motivational self-system in 2 state universities among 918 university students from Lankan displaced and relocated areas. The study has found that the Ideal L2 self is the strongest among them. Both of these studies have been conducted with possible selves and L2 Motivational self-system in state universities and insufficient research is on testing L2 Motivational self-system in a private institute in higher education. By doing this study, the data can be used to show how L2 selves can be used to improve L2 learning experience in classrooms in higher education institutes to motivate L2 learning.

The present study aims to accept or reject the following hypothesis: there is a significant difference between the first year undergraduates following engineering foreign degrees and local engineering degrees in terms of the values of the following components of the L2 Motivational Self System: Ideal L2 self, Ought-to L2 self and L2 learning experience. The Null Hypothesis is that there is no significant difference between the first year students following engineering foreign degrees and local engineering degrees in terms of the values of following components of the L2 Motivational Self System: Ideal L2 self, Ought-to L2 self and L2 learning experience.

## MATERIALS AND METHODS

The research design used was quantitative. A questionnaire containing 40 test items was prepared using the Likert scale of a scale of 1 for "strongly disagree" to 6 for "strongly agree". The questionnaire contains two sections: the first section of the questionnaire contained test items referring to the 3 components of the model being tested in the sample and the

second section collected some bio data of the students such as gender, native language etc. Part 1 of the questionnaire contained 40 items testing the 3 components of the L2 Motivational system. Items 1, 2, 33-40 were on Ideal-L2-Self, items 3-15 were tested on Ought-to L2-self and items 16-32 were tested on the L2 learning experience. The questionnaire was translated into both Sinhala and Tamil and distributed among the students. The sample taken for the study was selected from the first year undergraduates of the engineering faculty of a private campus where both local and foreign engineering degrees were taught. The questionnaire was administered to the engineering students following the first year English semester program. From the respondents of the questionnaire, 212 engineering first year students following the local engineering degrees and 62 engineering first year students following a foreign degree were selected as the sample. The method used to compare the 2 independent samples was the 2 sample T-test. Using the t-test, the statistical information regarding the following components were shown.

## RESULTS AND DISCUSSION

The discussion is based on the statistical results obtained from the 3 components of the L2 Motivational Self System.

### The Ideal L2 Self Independent Samples' Test

Table 1.1: T-test data on Ideal L2 Self

	Independent Samples' Test						
	t-test for Equality of Means						95% Confidence Interval of the Difference
	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Question1	.885	273	.377	.12547	.14176	-.15360	.40455

Question2	.985	273	.325	.14584	.14800	-.14552	.43720
Question34	2.328	273	.021	.46191	.19838	.07136	.85246
Question35	3.046	273	.003	.60321	.19802	.21337	.99305
Question36	2.409	273	.017	.45237	.18779	.08266	.82208
Question37	2.129	273	.034	.44192	.20761	.03321	.85063
Question38	3.389	273	.001	.61305	.18089	.25693	.96918
Question39	3.461	273	.001	.58163	.16803	.25083	.91243
Question40	1.988	273	.048	.35847	.18028	.00355	.71340

The table 1.1 shows the results of independent sample test for Ideal L2 Self. Items 35-40 show a significant difference between local and foreign engineering first year students.

Since the significant difference of the items 35-40 was less than 0.05, the null hypothesis of that there is no difference on the Ideal L2 between the local degree students and foreign degree students is rejected. The items 34-40 all refer the ideal L2 learner's visualization of using the language in future which is different from the 2 groups of students. When taking the mean comparison of the 2 groups, from items 1-2 and 33-40, foreign degree students have higher agreement for statements describing their ideal L2 than the agreement for the afore mentioned statements of the local degree students.

Therefore, based on the data of the table 1.1, it seems that those following foreign degrees have more personal reasons that inspire them to complete their degrees in English than those following local degrees. Ones following local degrees most likely work within local context and may not need to visualize themselves using English as much as those who most likely would work abroad. Not having an ideal L2 self to motivate students in local context could be one issue that could prevent L2 learners from

learning English and this could be used as an innovative solution for the current learning

issues faced by L2 learners to motivate themselves learning English.

### The Ought-to L2 Self

Table 1.2 shows the results for Ought-to L2 Self between the engineering local and foreign degree first year students:

Table 1.2: T-test data on ought to L2 Self

	t-test for Equality of Means						
	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
						Lower	Upper
Question3	-2.367	274	.019	-.46457	.19626	-.85093	-.07820
Question7	3.255	274	.001	.75341	.23145	.29777	1.20905
Question10	1.686	274	.093	.37983	.22527	.06365	.82332
Question11	2.128	274	.034	.47552	.22342	.03569	.91535
Question14	2.028	274	.043	.42902	.21151	.01263	.84541

Table 1.3: T-test data L2 Learning Experience

Independent Samples Test							
	t-test for Equality of Means						
	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
						Lower	Upper
Question16	3.606	274	.000	.72636	.20145	.32976	1.12295
Question20	3.212	274	.001	.58909	.18339	.22806	.95012
Question21	1.905	274	.058	.34742	.18235	-.01156	.70640

By looking at the significant difference presented for items 3, 7, 11 and 14 is less than 0.05, the null hypothesis which states there is no difference in Ought-to L2 self between the local and foreign degree first year students is rejected. When making the mean comparison between the two groups of students for separate items of the Ought-to L2 self, the local degree students have agreed more for items 3-6 than the foreign degree students whereas foreign degree students have a higher agreement for items 7-15 than the local degree students. In Ought-to L2 Self, the local degree students study English as a necessity as their friends are studying English, for passing the English module, and for completing the degree whereas the foreign degree students in the Ought-to L2 Self-study English for people in their life such as parents, friends and as a professional requirement.

Therefore, based on the data of Table 1.2, it seems that those following local degrees are more motivated to learn English for external reasons than those following foreign degrees. By studying the Ought-to L2 self to motivate the L2 learners learning English, this L2 Self could be promoted more among the L2 learners in universities.

### The L2 Learning Experience

Table 1.3 shows the statistical data related to L2 Learning experience:

Looking at items 16-32, there is a significant difference for items 16 (0.000) and 20 (0.001) for the L2 Learning environment which refutes the null hypothesis that there is no difference between the local degree and foreign degree students in L2 Learning environment. Furthermore, when looking at the mean comparison of separate 17 items, the foreign

degree students have agreed more highly in 10 items: 16, 18, 20-22, 25, 27, 29, and 31-32 whereas the local degree students have agreed more highly in 7 items: 17, 19, 23-24, 26, 28, and 30. This means while local degree students are influenced to learn English from the following factors in their L2 Learning environment such as having an enjoyable L2 classroom and curriculum, having learned English in school and being role models for their younger siblings, foreign degree students are influenced by factors such as their L2 learning environment to study English are class environment, English teacher, and teaching/learning materials. Students, learner background, learning experience and parents.

Therefore, based on the data of Table 1.3, it seems that foreign degrees students are motivated to learn English by the L2 Learning experience they have experienced more than those following local degrees. The data shows that L2 learning experience is also crucial for the L2 learning in universities.

## CONCLUSION

In conclusion, the following findings were obtained from the study conducted with the first year engineering students studying in a private campus testing, the null hypotheses were rejected and the following findings were discovered. There was a significant difference between the p-value between the 62 foreign degree students and the 212 local degree students in all 3 components of the L2 Motivational Self System: Ideal L2 self, Ought-to-L2 self and the L2 learning experience. First year engineering students following foreign degrees have higher ideal L2 selves and L2 learning experience than those following local degrees students.

## ACKNOWLEDGEMENT

I am grateful for the help I got from the following people: the faculty staff for allowing me to conduct the study, the ones helped me to

translate the questionnaire into Tamil, my father who supported me in more accurate Sinhala translation of the questionnaire, Mr. Heshan for helping me with the statistics and students for having participated in this study.

## REFERENCES

- Csizér K. & Dörnyei Z. (2005a). The Internal structure of language learning motivation and its relationship with language choice and learning effort. *The Modern Language Journal*, 89, 19-36.
- Csizér K. & Dörnyei Z. (2005b). Language Learners' Motivational Profiles and Their Motivated Learning Behavior. *Language Learning* 55(4), 613-659.
- De Silva U. (2020). L2 Selves Experienced among Sri Lankan Learners of Japanese as a Foreign Language. *The Faculty Journal of Humanities and Social Sciences*, 09 (1), 83-96.
- Gardner R. C. (1985). *Social psychology and second language learning: The role of attitudes and motivation*. Edward Arnold Publishers.
- Markus H. & Nurius P. (1986). Possible selves. *American Psychologist*, 41(9), 954-969.
- Martinović A. (2018). The L2 motivational self-system: Differences among learners *Jezikoslovje* 19(1), 133-157.
- Prasangani K.S.N. (2018) Investigation of L2 Motivational Self System: A Comparative Study of Undergraduates from Displaced and Resettled Regions in Sri Lanka. *Sabaragamuwa University* 16(1), 58-67.
- Ushioda E., & Dörnyei Z. (2012). Motivation. In S. Gass & A. Mackey (Eds.), *The Routledge handbook of second language acquisition*, 396-409.





## English Speech Production of Native Sinhala Speakers with Special Reference to Inter-language Analysis

H M Thisaranie Wijayabandara<sup>1\*</sup>

<sup>1\*</sup>Independent Researcher

### ARTICLE INFO

#### Article History:

Received Date: 01 July 2022

Accepted Date: 15 September 2022

#### Keywords:

Inter-language; Learner language; Sinhala language; Speech production; Syntactic structure

#### Citation:

H M Thisaranie Wijayabandara. (2022). *English Speech Production of Native Sinhala Speakers with Special Reference to Inter-language Analysis*. Proceedings of SLIIT International Conference on Advancements in Sciences and Humanities, (11) October, Colombo, 61 - 64.

### ABSTRACT

Native Sinhala speakers attempt to speak in English even prior to formal education regardless of the errors they make in speech production. This study is focused on inter-language, the linguistic system behind the learner language of these native speakers, influenced by the first language and the target language. This research was conducted to analyze the impact of the Sinhala language on the English speech production of native speakers. A qualitative research approach was taken to initiate this research with 30 native Sinhala speakers, who informally learnt to speak English. They were asked to interpret a few simple English sentences to Sinhala. Each translated utterance was simultaneously recorded and analyzed to observe the produced patterns of the inter-language. Results indicate that the inter-language production of the speakers was visible in the structure of language and specific grammar rules about spoken English. Syntactic pattern, word order, misidentifying nouns and adjectives, omission of the 'be verbs', the misconception of verb tenses, and chaotic pronoun placement are included in the native language influence. The findings of this inter-language analysis concluded that the native language is a dominant factor in second language speech production. Competence in the first language is the main reason for this dominance since the speaker tries to perceive a second language most comfortably. Further, the importance of

\*Thisaranie,



introducing Psycholinguistics in Sri Lanka is emphasized.

## INTRODUCTION

Sinhala language is one of the official languages in Sri Lanka. Native Sinhala speakers learn English as their second language despite learning another official language. The majority of the native Sinhala speakers properly reach stages of second language acquisition after schooling. Even though Sri Lanka is known for its high literacy rate in Asia, advanced fluency in English takes a considerable amount of time. Therefore, there is a tendency in most Sinhala native-speaking families nowadays to establish English as the first language for their younger generations. The linguistic system behind the learner language of these native speakers is known as the inter-language. Thus, this study is based on the concept of inter-language.

Yule (1985) has pointed out that inter-language is “An interim system of L2 learners, which has some features of the L1 and L2 plus some that are independent of the L1 and L2”. Accordingly, the current study specifically recognizes the influential features of the native language/L1 (Sinhala) in this linguistic system with the speech production of a group of people who do not get the opportunity to engage in formal language learning. This is another area of research interest on how people in certain countries do not get the required access to learn the world’s lingua franca. Nonetheless, an inter-language prior to formal learning can be seen as a sign of progress.

Academically, this study would benefit any foreign language instructor assigned to teach the language to speakers with some other first language. The study would also be ideal for academics who expect to continue research on inter-language analysis, native language influence, and linguistic concepts relating to language frameworks of a source language and a target language. Furthermore, this would be a base to reevaluate language teaching curriculums in Sri Lankan schools. Practically, this study would emphasize the importance of identifying the English-speaking potential of native Sinhala speakers. The method can be applied to any native language-speaking community that attempts to learn a second language. Circumstantially, the given group of people do not have formal language learning.

Hitherto, they have absorbed words and phrases of a foreign language to make a system that helps them in unrehearsed communication.

According to the Center for Advanced Research on Language Acquisition, “In error analysis, you look at learner language in terms of deviance from the target language norms; that deviance we call ‘error.’ In inter-language analysis, you can look at the same learner language but now you ask what system the learner might be using to produce the patterns you observe.” In contrast to an error analysis, inter-language analysis identifies and observes specific patterns to overcome language learning barriers.

Selinker (1972) and Tarrone (1994) both have stated that the association of the first language and second language in interlanguage do not define the dominance of one party. On the contrary, Yule sees it as an interim system where it is visible to see the characteristics of L1 and L2 as mentioned above. A scholar from Sri Lanka has published a research paper on the influence of the Tamil (L1) language on English learning (Rahuman, 2017). He has mentioned that direct translations from Tamil to English have caused learners meaningless sentence compositions. Apart from the influential language factors, Sinhala language also possesses the psycholinguistic issue on direct translations. In simplest terms, the speaker is unable to articulate an utterance by thinking in L2.

However, English language interference can be seen in interlanguage with the use of loan words. It is not as dominant as the syntactical and grammatical changes made by Sinhala influence. An error analysis by a Sri Lankan on English writing of Sinhala speaking students has mentioned about L1 power over L2 (Abeywickrama, 2010).

Kanduboda (2014) concludes his research on Sinhala syntax by stating the fact that “the Sinhala language has quite a flexible word order, implying that it could possibly have a non-configurational syntactic structure” In fact, this explains the long pauses of Sinhala speakers when speaking in English. With the prevailing flexible word orders, native Sinhala speakers think of the best utterance with word order.

Accordingly, the present study aims to identify further and observe the native Sinhala language influence on speaking English in

speech production while emphasising the need to absorb more interlanguage analysis. While previous research has focused on written interlanguage with special reference to particular English and Sinhala words, this research analyses the influence of the native language in speech production. Most researchers based in Sri Lanka have invested in error analysis. Further investigations are needed to promote interlanguage analysis in language-related studies where learned people are encouraged to investigate new patterns other than errors.

## MATERIALS AND METHODS

Data for the present study was taken from the responses of 30 individuals from Galle, a place of tourist attraction in Sri Lanka. Selective sampling was used to make the selection for the particular course. The sample consisted of three-wheeler drivers of Galle (25-55 age range) who make a living by giving rides to tourists. Even though they required English language fluency for their survival, the chosen sample had learnt the language independently. They had stopped schooling in the middle of somewhere and had not received formal English language learning opportunities. According to them, they had learnt essential English words and phrases by listening to others.

Each one of these drivers were asked to answer 10 uncomplicated questions orally. Questions were designed to tackle the speakers articulating English phrases by touching on syntactic and lexical categories. Responses were recorded for the later analysis of finding the Sinhala language influence. This research was primarily designed to analyse this interlanguage with special reference to the native language. Hence, it is perceptible that this research was conducted with the hypotheses of native language influence.

## RESULTS AND DISCUSSION

Several native language factors that influenced the speakers' interlanguage production are identified. Among them, the sentence order of the Sinhala language is the first factor. This has been adopted with the automatic literal translation.

## Syntactic Order

According to Kanduboda (2014), a native speaker of a profound language will be able to identify syntactic orders intuitively without the formal education to understand elements of a sentence. Although the favoured order in the Sinhala language is Subject, Object, and Verb (SOV), OSV, OVS, VSO, VOS, and SVO are also used orally. In the current study, some speakers find it ambiguous to apply the correct order in English because they are not accustomed to a strict pattern like English. Sri Lankan syntax pattern is applied in the following utterances.

- 1) Work I went - Wædətə mamə giya:
- 2) Work went I - Wædətə giya: mamə
- 3) Went I work - Giya: mamə wædətə
- 4) Went work I - Giya: wædətə mamə
- 5) I went work - Mamə giya: wædətə

Sentences have been composed, but the syntactic order is applied according to the Sinhala pattern. Even though the English word order is portrayed in example 5, the use of 'to' have been omitted by aligning it with the Sinhala word order.

## Misidentifying Nouns and Adjectives

The second native language influence identified in the study is the inability to understand the difference between nouns and adjectives. The Sinhala language has some words which work as nouns and adjectives.

- 6) Short man - Kotə minihek
- 7) His short - Eya:ge kotə!

In example 7, the speaker wants to express his idea on a person's shortness and uses the same word as in Sinhala. The word 'kotə' can be used in Sinhala as a noun and a verb. Likewise, the speaker has used the same word to express a short stature person in the 6th example.

## Omission of the Be Verbs

Another native language is the omission of 'be' verbs. Below mentioned examples delineate how a native speaker excludes factors that are unknown to him.

- 8) She teacher - Eya: ti:tʃə kenek
- 9) I Nimal - Mamə Nimal

In example 8, the speaker has left out 'is' and composed the sentence disregarding the

indefinite article while 'am' is missing in the 9th example where a person talks about himself.

### Misconception of Verb Tenses

While there is an ongoing debate about Sinhala being a tenseless language, it has been interpreted as a language with past and non-past tenses. On the contrary, the English language has three tenses: present, past and future.

- 10) I ate - Mamə kə:wa
- 11) I eat - Mamə kanəwa
- 12) I eat - Mamə kanəwa (future tense)

Above mentioned utterances were taken by asking the speakers to translate the given terms. They perfectly did the assignment in the present tense and past tense. However, present tense was applied to past tense as well. In the 12th example, speakers were asked to translate the idea of eating in the near future. Nevertheless, they have omitted 'will' because of the same verb formation in Sinhala future and present tense.

### Pronoun Placement

In spoken Sinhala, 'eya:' is used as a common term for 'he' and 'she'. Therefore, the particular speakers have randomly used 'he' and 'she' without relating to the actual connection they have to do with genders. Even though the girl is feminine and the use of she is a must in the English language, the speaker has used instead of she with the hypothesis of it being similar to 'eya:'. Likewise, a masculine noun can also be followed by a feminine pronoun.

- 13) My girl name mala. He clerk. He work at a lawyer.

### CONCLUSION

This research revealed the native Sinhala language's influence on English speech production using an interlanguage analysis.

Speakers borrow features like syntactic pattern, word order, misidentifying nouns and adjectives, verb tenses, and pronouns from the Sinhala language. It was clear that it is hard to be fluent in the language without formal education in identifying parts of speech and grammatical aspects of a second language. It has been also noted how speakers first do a literal translation in mind before articulating. Direct translation has worked as the root cause of all the observed influences. This study suggests doing more interlanguage analysis with a special concern on psycholinguistics to develop the language learning capacities of English language learners. A maximum of 15 references can be included at the end of the paper.

### REFERENCES

- Abdul-Rahman M. M. (2017). A study of mother tongue influence on learning English as a second language by Tamil speaking students. 667–689.
- Abeywickrama R. (2011). An Analysis of Errors in English Writing of Sinhala Speaking Undergraduates. Sabaragamuwa University Journal, 9(1), 97.
- Kanduboda A. P. (2014). Issues in Sinhala Syntax: Sentence Processing and Word Order. Sri Lanka Journal of Humanities, 37(1–2), 157.
- Overview of Interlanguage. (2021). <https://Carla.Umn.Edu>.  
<https://carla.umn.edu/learnerlanguage/interlanguage.html>
- Selinker L. (1972). INTERLANGUAGE. IRAL - International Review of Applied Linguistics in Language Teaching, 10(1–4).
- Yule G. (2016). The Study of Language. Cambridge University Press.



## Austen, Cinderella Complex and beyond: An analysis of Austen's portrayal of her Heroines in Juxtaposition to the Cinderella Complex

Upeksha Rathnasena<sup>1\*</sup>

<sup>1</sup>SLIIT

### ARTICLE INFO

#### Article History:

Received Date: 01 July 2022

Accepted Date: 15 September 2022

#### Keywords:

Victorian women, Cinderella Complex, marriage, self-discovery, happiness

#### Citation:

Upeksha Rathnasena. (2022). *Austen, Cinderella Complex and beyond: An analysis of Austen's portrayal of her Heroines in Juxtaposition to the Cinderella Complex*. Proceedings of SLIIT International Conference on Advancements in Sciences and Humanities, (11) October, Colombo, 65 - 69.

### ABSTRACT

Jane Austen is one of the most prominent writers of the 19th century. In terms of chronology, her six novels fall between the 18th-century neoclassical formality and the effusive romanticism after the 19th century. Her novels portray the socio-political and cultural landscape of Regency England even though her prose style, manner, and approach held no resemblance to her contemporaries. Austen seems to operate in a limited landscape and writes about what she is most familiar with birth, love, marriage, death, faith, and judgment. She details the tedious business of living of the gentry in her society and displays unrivaled knowledge of the upper middle class. Even though issues of women were at the crux of Austen's writing, Austen is not considered to be a staunch feminist writer. She concentrated on upper-middle-class women whose marriage, and courtship were the cynosure of her plots as she thoroughly examines the right basis for marriage in her work. However, most of her heroines have been written off critically as the selfsame Cinderellas. Therefore, the monotonous aura engulfing Austenian heroines who are in search of marital bliss has been inadvertently appendaged to the Cinderella Complex and hence the prejudiced critique. Austenian heroines are said to lack passion and vibrancy and by extension, character. This paper intends to analyze the portrayal of two Austenian heroines in view of the Cinderella Complex with the objective of exploring these portrayals beyond the Cinderella archetype.

\*Upeksha, upeksha.r@slit.lk

## INTRODUCTION

Austenian critics over the years have shed light on Jane Austen's craftsmanship, her genius, and also her limitation as a writer operant during a period that was marred by turbulent historical events such as Napoleonic invasions and the French Revolution. In fact, Austen has been accused of overlooking these major historical and political events in her novels except in the instances where she mentions the militia visiting Bath or any other city mentioned in her novels in addition to the soldiers and captains of the militia being the suitors or love interests of her marriageable young women. Even though Jane Austen has been criticized for her limited canvas and thematic banality by many critics, that trait itself has led to her critical acclaim as a "Realist". This marks a remarkable era in the English novel – the representation of character and incident in an ordinary context thus promoting the cult of Realism. Even though there has been no critical consensus with regard to Austen's work throughout the decades, a significant revival of interest in her novels as her penetrating realism divested of ulterior motive, sans adornments was seen in the 20th century. Furthermore, one needs to make note of the most common critique of her heroines is that they display an "absence of passion" as observed by Charlotte Bronte (1850). Elizabeth Barret Browning (1841 as cited by Rosa in 2015) also corroborated by stating that her heroines lacked "souls" highlighting the lack of visible turbulent passion. The predominant accusation levelled against Austenian heroines is the conspicuous Cinderella Complex embedded in her plots where young women are portrayed as hapless man hunters who are in destitute financial circumstances which have overshadowed any constructive criticism and resulted in prejudiced critiques of her heroines over decades.

## SIGNIFICANCE OF THE STUDY

Regardless of critical acclaim, Austen has not been recognized as a social reformer who revolutionized the contemporary cult of the novel. Most of her novels are Novels of Manners where she examines her characters with reference to their mundane engagements. Therefore, Austen's characters are noticeably

isolated from the contemporary socio-economic and political phenomena of her times. The only occupation of her heroines seems to be securing a partner with considerable wealth and social stability. Thus, Austen's heroines have been judged through the Cinderella Complex lens which views women as helpless individuals in need of men's protection for survival. This paper intends to argue that Austen's heroines have more intricate traits with intriguing layers of personality with more character depth via the analysis of the portrayal of two heroines: Elizabeth Bennett [*Pride and Prejudice*] and Anne Elliot [*Persuasion*]. Furthermore, it intends to provide a fresh frame of reference for these Austenian heroines who have been relegated and reduced to the archetype of Cinderella by many critics.

## MATERIALS AND METHODS

The method adopted for this study is a combination of descriptive and historical analysis of Jane Austen's novels and a study of critiques that are available. A range of reading materials such as handbooks, journal articles, literary reviews, memoirs, and several online resources was utilized.

## LITERATURE REVIEW

The central premise of this study is the Cinderella Complex which is also known as the Cinderella syndrome which originated in the fairy tale where Cinderella is rescued from the evil stepmother and the sisters by Prince Charming. This was first conceptualized by a New York therapist called Collette Dowling in 1981. Accordingly, this complex leads a woman to be overly dependent on a man, especially for financial stability which in Victorian society was essentially attained via marriage. Further to Kelly (1994), women are generally prepared to be dependent and looked after so that they do not seek freedom which creates a dependent mindset. Kelly further explicates how this thinking leads women to seek men for protection. In the view of Saha & Safri (2016), Victorian women were trained to be "compliant, attractive, faithful, and sexually clean" to be accepted in society as marriage material. Further to Shaw & Lee (2001) the "Perfect girl" was considered to be perpetually polite and soft-spoken which corroborates with

the original Cinderella who never harbours a grudge against her scheming stepmother and vicious stepsisters.

According to Dowling (1998), Victorian mothers also played a part in creating this dependent mindset in their daughters by teaching them to be dependent on patriarchal figures which ultimately extends to finding a partner for the daughter to secure financial stability and social recognition. This is evident in Mrs. Bennet's almost frantic pursuit of suitors for her five daughters in Austen's most popular novel *Pride and Prejudice* and the fact that Anne Elliot is sympathized by society for not being able to secure a man of significance in *Persuasion*. As construed by Saha & Safri (2016) those who suffer from the Cinderella syndrome identify themselves to be "young girls in agony" who are awaiting their rescue by a desirable bachelor and by extension have resigned to being controlled by men in their search of financial and psychological dependence.

Dowling (1998) identifies three specific psychological effects of the Cinderella Complex.

1. Lack of self-esteem
2. Lack of confidence
3. Anxiety

Further to Dowling, these women are remarkably submissive to the point where they are happy to provide the reins of their lives to men willingly, and as Dowling further explicates these women consider enduring hardships as the prime virtue which will ultimately be rewarded with a happy marriage as is the case with Cinderella in the fairy tale. As inferred by Barnes (2009) Cinderella Complex can be seen in all females that manifests in a deep-rooted fear of independence. According to Barnes Cinderella Complex is reflected in the way women are kept in check as their creative strain is suppressed, and attitudes manipulated into repression where they await some external force to bring about their metamorphosis.

Any cursory look at Austen's novels prompts us to validate the common belief that her heroines mirror the above-explained Cinderella Cycle and the identical characteristics in her immaculately woven romantic plots. However, if one takes a microscopic view at her heroines' narratives, a different motive can be detected which is the focus of the following section of this paper.

## DISCUSSION

### **Austenian Heroines and the Cinderella Complex**

In popular culture, Jane Austen is synonymous with exquisite gowns, waltzing, accomplished women, and most of all, happy endings in the culmination of marital bliss. All six novels are centered around the female titular character whose romantic journey ends in a happy marriage subsequent to championing several obstacles. This plot seems relatively simple which has led most of the critics to underestimate Austen's craft and her scope as limited and her themes banal. As a result, critics seem to have overlooked each heroine's unique transformation which if one examines the plot carefully is anything but basic. Therefore, the following section examines the portrayal of two Austenian heroines with the objective of presenting a different angle other than critiquing them through the Cinderella lens.

### **Elizabeth Bennet and the manifestation of the Cinderella Complex**

Elizabeth Bennett, Jane Austen's most popular heroine seems to follow the same Cinderella path, as happiness in life is attained via a convenient marital union which brings both her and her family financial stability and social prestige. Even though her marriage seems like a fairy tale there are several distinct deviations from the Cinderella Complex. First, Elizabeth declines a very promising marriage proposal from Darcy, fully aware of how that union could salvage her financial crisis along with her family's stability which is significantly in contrast to what a typical Cinderella in search of an eligible partner would have done. However, Austen has been constantly criticized for writing exclusively on marriage. This is in fact partially true as Elizabeth's character is drafted in relation to her reaction to the plot's exploration of marriage, money, and pride. Even though Elizabeth does enter a fairytale-like marriage it is not her sole preoccupation or the only trait that defines her. Elizabeth is portrayed as a person with intellect, and independence, and as a shrewd judge of character. We get an insight into her mindset and values when she says "four dancers with Bingley do not offer Jane any insight into his

inner self. This is not quite enough to understand his character” referring to Jane’s potential union with Mr. Bingley. This reflects Elizabeth’s high regard for mutual understanding in a marital union as opposed to being blinded by a potential suitor’s wealth and social standing.

Furthermore, Elizabeth’s transformation from being prejudiced towards Darcy owing to her initial negative impression marks a journey of discovery for Elizabeth, and her change of mind towards him does not stem from her desperation for a partner. Instead, it is an educational endeavor culminating in an informed understanding on her part unlike that of Cinderella’s one-way process. Moreover, her acute rejection of Mr. Collins, another suitor signifies her priority; “Happiness” despite her family’s sordid financial predicament. She earnestly requests Mr. Collins to consider her not as “an elegant female” but as “a rational creature”. In this instance, Elizabeth stands out as an independent woman who has her feet firmly grounded on her principles and establishes herself as an individual who has a voice of her own which stands in stark contrast to the Cinderella complex which identifies submission and dependence as defining traits of character. The theme of the rational creature corroborates with the initial claim of Enlightenment of feminism propagated by Mary Wollstonecraft (1759-1797) who stressed the importance of women having status to be considered rational beings. In Elizabeth’s refusal of Darcy, Austen explicates the power play, as marriage was seen as the only sanctuary for a woman of mediocre means.

It is also important to notice Mr. Bennet’s idea of a husband for Elizabeth who must be in his words “her partner in life” and that she will never be happy “in an unequal marriage”. This is in fact the same notion that was articulated by the movement of enlightenment of feminism. In other words, Elizabeth can be seen as a champion of this cause as she gets into a marital union only on her own terms and conditions. Therefore, it can be stated that Austen’s portrayal of Elizabeth Bennet is not a mere manifestation of the Cinderella complex, but a relatively deeper analysis of the intricate layers hidden behind the Cinderella façade reflecting a personal journey of enlightenment, self-definition achieved visa vis the dissipation of prejudice.

## **Anne Elliot and the manifestation of the Cinderella Complex**

Anne Elliot, the heroine of Austen’s posthumously published novel “Persuasion” is presented as “only Anne” by Austen herself while she is “nobody with either father or sister” and “her word had no weight”. At the onset of the novel, she seems to be the perfect “damsel in distress” (my italics) who is eagerly waiting to be rescued by her Prince Charming. However, the portrayal of Anne Elliot provides the reader with a completely different Austenian experience. Unlike that of Elizabeth Bennett, Anne’s narrative is not necessarily a chronicle of falling in love as she had already had her share of experiencing love and the sorrow of separation. Instead, Austen’s portrayal is that of identity construction through self-definition.

Being mature in years in comparison to other Austenian heroines, the author highlights the necessity for Anne to establish herself and highlights the importance of identity for Anne. Initially, Anne is implicitly passive and unassertive that finely corroborates with the Cinderella complex explicated in the Literature Review. She is constantly transplanted to suit others’ agendas and is projected as a commodity. Her former fiancé resents her for giving in to persuasion at the risk of her happiness and Anne seems to have been in a dilemma between her happiness and societal requirements. In her journey of self-definition and identity construction, Anne must refute Captain Wentworth’s accusation of “feebleness of character”. Anne must transform herself from being a nobody to somebody and from stagnant passivity to active pragmatism. she achieves this in the Cobb scene where she commands authority and earns respect as she rises to the occasion and handles the crisis in a confident manner.

In the development of Anne’s character, Austen gradually elevates her social standing from someone who occupied the most peripheral space in the community and her family to the level of cynosure. Therefore, her metamorphosis constitutes several phases of Anne’s identity construction, and her relationship with Captain Wentworth is redefined as she manages to forge a renewed identity for herself as an assertive young woman who has been consistent in her affection towards him, and in one argument she

says “men have had every advantage of us in telling their own story. Education has been there in so much higher degree the pain has been in their hands. I will not allow books to prove anything”. In contrast to her previous unassertive and submissive character, she has transformed herself into a radical woman in the defense of her own gender who is outspoken and exposes the discriminative impact, the male literary tradition had on women. In other words, she criticizes the contemporary practice of providing only males access to education. Consequently, it must be stated that Anne’s reunion with Captain Wentworth marks a milestone in her journey of identity construction as she liberates herself from the norm and marries an “outsider” as perceived by her family. Therefore, it can be stated that Anne Elliot cannot be categorically labeled a Cinderella as her transformation is remarkably radical and refreshing for a heroine who is initially portrayed as a “nobody”.

## CONCLUSION

As stated before, Austen transformed the existing image of heroines by rewriting them. The conventional heroine was an embodiment of refinement, skills in painting, music, dancing, submissiveness, and beauty in Victorian society, and the above-mentioned attributes made a woman desirable and marriageable. The two heroines analyzed above do not necessarily fit into this conventional framework as Elizabeth is an opinionated young woman with a mind of her own whereas Anne is initially portrayed as a submissive character who finally finds her voice. Therefore, Austenian heroines cannot be dismissed as “Cinderellas” even though the very fact that Jane Austen finds them in happy marital unions has prompted the Cinderella label. However, if we consider the journey of each heroine, it is evident that each journey is unique. For example, Elizabeth’s journey is of self-discovery while in the case of Anne, it is a journey of identity construction. Therefore, it can be stated that Austen succeeded in bringing out her heroines’ enlightenment and self-discovery in several manifestations which

debunks the Cinderella Complex label in a convincing manner.

## REFERENCES

- Barnes, S. L. (2009). Romantic and familial relationships with black males: Implications of the Cinderella complex and Prince Charming ideal. *Black Women, Gender, and Families*, 3, 2, 1-28.
- Dowling Colette. (1981). *The Cinderella Complex, Women’s hidden fear of independence*, pp.3-6, Pocket Books, New York.
- Dowling C. (1998). *Cinderella Complex: The fear of independence in contemporary women* (S. Budak). Oteki.
- García-Periago, Rosa. (2015). Review of Uses of Austen. *Atlantis*. 37. 219-223.
- Hudson G.A. (1992). Fairy Godmothers and Ugly Sisters: The Cinderella Motif in Austen’s Fiction. In: *Sibling Love and Incest in Jane Austen’s Fiction*. Palgrave Macmillan, London. [https://doi.org/10.1007/978-1-349-21866-0\\_5](https://doi.org/10.1007/978-1-349-21866-0_5)
- Kelley K. (1994). A modern Cinderella. *Journal of American Culture*, 17, 1, 87-92.
- Shaw S. M. & Lee J. (2001). *Women's voices, feminist visions: Classic and contemporary readings*. McGraw-Hill Publishing Company.
- Saha S. & Safri T.S. (2016). Cinderella Complex: Theoretical roots to psychological dependency syndrome in women. *The International Journal of Indian Psychology*, 3, 3, 118-122.
- Penguin. (1986). *The juvenilia of Jane Austen and Charlotte Bronte*
- Wollstonecraft M. (1989), *The Works of Mary Wollstonecraft*, (ed.) Janet Todd and Marilyn Butler, New York: New York University Press, Volume V.





## Trajectory of Learning Academic Vocabulary: IT Undergraduates' Vocabulary Learning Strategies and Performance at the Exam

Jayathri Kalinga<sup>1\*</sup>

<sup>1</sup>English Language Teaching Unit, Sri Lanka Institute of Information Technology

### ARTICLE INFO

#### Article History:

Received Date: 01 July 2022

Accepted Date: 15 September 2022

#### Keywords:

Academic vocabulary, Vocabulary learning strategies, IT undergraduates, formative assessment

#### Citation:

Jayathri Kalinga. (2022). *Trajectory of Learning Academic Vocabulary: IT Undergraduates' Vocabulary Learning Strategies and Performance at the Exam*. Proceedings of SLIIT International Conference on Advancements in Sciences and Humanities, (11) October, Colombo, 70 - 76.

### ABSTRACT

Learning vocabulary is an integral part in language acquisition and acquisition of academic vocabulary is crucial for the success in an academic context. Therefore, many studies have been conducted to formulate academic vocabulary lists and identify vocabulary learning strategies. This study seeks to explore the vocabulary learning strategies employed by IT undergraduates when studying academic vocabulary and to examine their performance on the academic vocabulary related questions at the formative exam. The sample of the study includes 276 first year IT undergraduates who follow the module English for Academic Purposes. A questionnaire is used as the research tool to obtain data from the sample and the result of the formative exam is used to examine the performance related to academic vocabulary. According to the data analysis, most of the students often use either monolingual or bilingual dictionary as a strategy to discover the meaning of a new word. This is more emphasized as they have mentioned that they prefer using dictionary apps as a strategy to learn vocabulary online. A significant number of students study the spelling, meaning and form of a word and ask for help from their friends as strategies for consolidating a new word they encounter. However, when comparing the marks obtained for the vocabulary related questions at the exam, it is noted that the students have obtained less marks to the question in which they had to replace the underlined word/phrases with a

\* Jayathri, Jayathri.k@slit.lk

more academic alternative. Thus, students need to adapt more effective strategies to acquire mastery of academic vocabulary.

## INTRODUCTION

“Without grammar very little can be conveyed, without vocabulary nothing can be conveyed” (Wilkins (1972) as cited in Schmitt, 2010). With this note, it is evident that vocabulary is a vital component in any language, and it raises several concerns in language acquisition such as knowing the number of words used by native speakers, knowing the number of words that are needed to learn, knowing the types of words to be learnt and finding the most effective vocabulary learning strategies. Coxhead and Nation (2001) categorize English vocabulary into four categories as high frequency words, academic vocabulary, technical vocabulary and low frequency words. Meanwhile, they claim that academic vocabulary “consists of 570 words that are reasonably frequent in a wide range of academic texts, but are not so common, although they do occur, in other kinds of texts” (p. 252). Accordingly, between 8.5% to 10% of running words (p. 252) in academic texts belong to the category of academic vocabulary thus making it an important learning component. Moreover, the complexity of knowing a word which involves knowing the form, meaning and use, increases the learning burden or the effort that is required from the learners to study a particular word (Nation, 2013) and learning academic vocabulary is no exception. Vocabulary learning strategies play an important role in the acquisition of vocabulary. Schmitt (2000) has created a list of vocabulary learning strategies with two categories. The first category consists of “strategies for the discovery of a new word's meaning” (p. 134) which includes strategies such as analyzing the form of the word, using a dictionary and asking help from the teacher or friends while the second category consists of “strategies for consolidating a word once it has been encountered” (p. 134) which refers to strategies such as using previous experience, using semantic maps, lists and engaging in verbal and written repetition. Further to these two broad categories, Schmitt has categorized them into sub sections as strategies that help determining the meaning, strategies that employ social interaction, strategies that utilize

memory, cognition and strategies that require metacognition (pp. 134-136).

A study conducted by Weeraratna, Wijetunge, and Jayasinghe (2017) discovered that there is no significant difference in undergraduates being exposed to their L1 in the process of acquisition of L2 vocabulary. Manchanayaka's study (2019) identified “use of written repetition, verbal repetition, and bilingual dictionary strategies” (p. 46) as the most preferred vocabulary learning strategies of Engineering Sciences students. Dharmawardene's (2020) study analysed the effectiveness of the virtual blended learning against the face-to-face mode in learning academic vocabulary, taking the undergraduates of a faculty of technology in a Sri Lankan university. Accordingly, the use of virtual blended learning which included peer collaboration proved to be effective compared to the face-to-face vocabulary learning method. Dhanapala (2007) compared the English language learning strategies of Japanese and Sri Lankan students and discovered that Sri Lankan learners employ the strategy of using newly learnt English vocabulary in a sentence in order to memorize them frequently compared to the Japanese students who use a picture or an image of the new word frequently to internalize a new word. In addition, the Japanese learners employ the strategies of using rhymes and flash cards as a means to learn vocabulary. Fernando (2021) explored the use of semantic mapping as a means to acquire L2 vocabulary and the results proved that the students prefer the use of semantic mapping due to its interesting and collaborative nature. Considering the available literature, it is evident that there is little research on exploring the vocabulary learning strategies used by IT undergraduates in Sri Lanka. This study seeks to explore the vocabulary learning strategies employed by IT undergraduates when studying academic vocabulary and to examine their performance on the academic vocabulary related questions at the formative exam. Based on this several objectives have been formulated namely; How often do the students use the vocabulary learning strategies listed by the researcher? How do the students perform for the vocabulary related questions at a formative exam?

## MATERIALS AND METHODS

This study is based on the quantitative research design using a survey as the research tool. The population of this study is the undergraduates who pursue a degree in Information Technology (IT) in a Sri Lankan non-state university. The sample of this study includes first year second semester undergraduates of the Faculty of Computing who voluntarily participated in filling the questionnaire available on their Learning Management System (LMS). The questionnaire which was created based on Schmitt's list of vocabulary learning strategies included those strategies as statements with a five-point Likert scale ranging from 'never' to 'always'. In addition, the questionnaire contained several statements that are related to the use of computer and IT to learn vocabulary and an open-ended question to express the problems faced by the students in learning academic vocabulary. Marks obtained by the students at the midterm examination was taken to examine the performance of the students.

## RESULTS AND DISCUSSION

The sample of the study includes 276 first year Faculty of Computing undergraduates among whom 63% are male students. The analysis of the frequency of using the vocabulary strategies are presented as percentages in Tables 1 to 3. The first set of strategies belong to the category of "strategies for the discovery of a new word's meaning" (p. 134) (See Table 1). It is evident that the majority of the sample employ the strategies of analyzing parts of speech and affixes 'sometimes' which is 43.12% while a considerable proportion which is 35.14% uses these strategies 'often', suggesting that the students pay attention to the form of a word when they discover new words. In addition, 37.32% of the sample guess the meaning of a new word from the textual context which can be considered as a skill of inferring. Use of dictionary is vital in vocabulary learning as the students have the option of using a monolingual or bilingual dictionary. More than half of the sample uses a bilingual dictionary either 'often' or 'always', raising a concern for the availability of proper bilingual dictionaries. Further to this, some students have mentioned that they "use google translate but sometimes

it shows the wrong meaning" and "it is difficult to find the meaning in English-English dictionaries" as difficulties they encounter when studying academic vocabulary. Preparation of vocabulary lists is seen as a rarely used strategy as more than half of the sample use vocabulary lists rarely or do not use them at all. Similarly, the students do not seek the help of their teacher either in requesting a translation for the English word or a synonym. However, the students prefer asking the meaning from a friend, majority mentioning 'sometimes' (37.32%) and approximately the same number of students using this strategy 'often' (32.25%). Despite the preference for asking the meaning from a friend, they do not study or practice vocabulary with a group of friends; 31.16% and 30.43% accounting for 'never' and 'rarely' respectively.

Table 1: Strategies for the discovery of a new word's meaning

Vocabulary learning strategy	Frequency of using the strategy				
	Never	Rarely	Sometimes	Often	Always
<b>I analyze parts of speech (e.g. noun, verb, adjective).</b>	3.2 6%	8.7 0%	43.12 %	35.14 %	9.7 8%
<b>I analyze affixes and roots to guess the meanings of words (e.g. replay – re means do it again).</b>	4.3 5%	9.7 8%	34.42 %	38.77 %	12.68 %
<b>I use the pictures or gestures to understand the meaning of Words.</b>	10.51 %	26.09 %	36.23 %	21.38 %	5.8 0%
<b>I guess the meanings of words from textual context.</b>	1.4 5%	9.7 8%	36.59 %	37.32 %	14.86 %
<b>I search the meaning of a word using an English -</b>	2.9 0%	13.77 %	27.54 %	32.61 %	23.19 %

<b>English dictionary.</b>					
<b>I search the meaning of a word using an English - Sinhala or Tamil dictionary</b>	14.13%	19.20%	26.09%	28.62%	11.96%
<b>I prepare a list of vocabulary and study it.</b>	27.54%	28.26%	27.17%	13.04%	3.9%
<b>When I do not understand the meaning of a word, I Ask the teacher to translate the meaning of a word.</b>	26.45%	40.94%	25.72%	5.80%	1.09%
<b>I ask the teacher for synonyms or similar meanings for a new Word.</b>	28.99%	45.65%	18.84%	5.07%	1.45%
<b>I ask the meaning of an unknown word from my friends in the class</b>	5.43%	16.67%	37.32%	32.25%	8.33%
<b>I study and practice vocabulary with a group of friends.</b>	31.16%	30.43%	25.36%	10.87%	2.17%

“Strategies for consolidating a word once it has been encountered” (Schmitt N. , 2000) are helpful for remembering the meaning of a word. Table 2 shows the statements included in the questionnaire that are related to this category. Accordingly, more than half of the sample have stated that they study words by connecting them to a previous personal experience supporting the view that adult learners “ have a whole range of life experiences to draw on” (Harmer, 2015). It should be noted that the selected student sample does not interact with native speakers as a means to improve their vocabulary suggesting that they may lack such opportunities. Moreover, they tend not to

connect a particular word to its synonyms or antonyms. Further, the students do not use the strategy of creating word groups accounting for 25.36% and 33.33% denoting ‘never’ and ‘rarely’ respectively. However, the students are more lenient towards studying the spelling, imagining the meaning and the form of the word and reading the word out loudly. In contrast, use of physical action and semantic or graphical maps seemed to be used less as majority of the sample stated either ‘never’ or ‘rarely’. Strategies of learning words through verbal and written repetition are employed either ‘sometimes’ or ‘often’ by the majority. Use of a vocabulary notebook is seen as a less frequent strategy with majority replying ‘never’ or ‘rarely’ while studying word lists have received a similar preference as majority ranges between ‘rarely’ and ‘sometimes’. Noticably, more than half of the sample use English language media such as movies, TV series and songs as a means to study vocabulary.

Table 2: Strategies for consolidating a word once it has been encountered

Vocabulary learning strategy	Frequency of using the strategy				
	Ne ver	Ra rel y	Som etim es	Of te n	Al w ay s
I study words by connecting the word to a previous personal experience.	6.52%	14.49%	39.86%	30.43%	8.70%
I study and practice vocabulary with a group of friends.	25.72%	35.4%	26.45%	10.7%	1.81%
I study new words by interacting with native speakers of English.	19.57%	30.80%	30.07%	15.2%	4.35%
I connect the word to its synonyms and antonyms.	5.80%	28.2%	45.29%	16.67%	3.99%
I create word groups and study them.	25.36%	33.3%	28.99%	10.4%	2.17%
I study the spelling of a word.	7.61%	18.12%	29.71%	31.8%	12.8%
I say new word aloud when studying.	13.77%	18.8%	28.26%	24.6%	14.4%

		4		4	9
		%		%	%
I use physical action when learning a word.	42.75	23.1	20.65	10.1	2.90
	%	9		1	%
		%		%	
I imagine the word's meaning and the form.	4.71	11.9	35.51	31.5	16.3
	1%	6	1%	2	0
		%		%	%
I use semantic maps or the graphical maps.	30.43	32.2	25.00	10.1	2.17
	%	5		4	%
		%		%	
I learn the word through verbal repetition.	2.90	18.1	38.41	30.4	10.1
	0%	2	1%	3	4
		%		%	%
I learn the word through written repetition.	9.06	18.8	36.96	26.0	9.06
	6%	4	6%	9	%
		%		%	
I keep a vocabulary notebook.	32.97	26.0	19.20	14.8	6.88
	%	9	0%	6	%
		%		%	
I study word lists.	19.57	23.9	33.33	17.0	6.16
	%	1	3%	3	%
		%		%	
I use English language media to study and consolidate vocabulary (Ex. songs, movies, TV series etc.)	2.17	6.88	19.57	34.0	37.3
	7%	%	7%	6	2
				%	%
I do vocabulary tests available on websites or books.	15.58	25.0	26.45	23.5	9.42
	%	0	5%	5	%
		%		%	
I skip certain new words when I study.	35.87	33.7	27.17	2.17	1.09
	%	0	7%	%	%
		%			
I continue to study the words over time.	3.62	11.5	36.59	35.1	13.0
	2%	9	9%	4	4
		%		%	%

The questionnaire included a section to investigate the use of technology in learning vocabulary. (See Table 3) Despite the students being surrounded by new technology as they are pursuing IT degrees, their tendency to use technology in learning vocabulary is significantly low. More than half of the sample claimed that they do not use online vocabulary games as a strategy to learn vocabulary and similarly they do not favour the use of

vocabulary learning apps and watching videos that teach vocabulary which are available online. In contrast, more than half of the sample often uses dictionary apps available online emphasising their answers given in the first section of the questionnaire.

Table 3: Strategies that use technology

Vocabulary learning strategy	Frequency of using the strategy				
	Never	Rarely	Sometimes	Often	Always
I play online vocabulary games	28.99%	31.88%	27.90%	8.70%	2.54%
I use vocabulary learning apps (mobile apps)	25.00%	17.03%	25.36%	24.28%	8.33%
I use dictionary apps	7.25%	12.68%	23.55%	31.88%	24.64%
I watch videos that teach vocabulary which are available on websites	19.20%	23.19%	26.09%	22.46%	9.06%

It is crucial to study the performance of the students at the exam in order to understand whether the students' vocabulary learning strategies have compensated at the exam. Two vocabulary related questions were given at the mid-term examination which was a part of continuous assessments. The first question carried fifteen questions and the students were supposed to select an academic alternative for the words underlined in these sentences. The objective of this question is to measure their understanding of the features of academic vocabulary such as formality. Table 4 shows the descriptive statistics obtained for the students' performance at the exam for question 1. Accordingly, the average mark for this question is 12.60507 while the medium value of 10 suggests that 50% of the students have scored less than 10 marks which is significantly low. Further, the mode value of 6 claims that the most students have scored 6 marks which is noticeably low. This data set is positively skewed (0.593168) emphasising that the

majority of the students have obtained low scores.

Table 4: Students' performance at the exam for question 1

Question 1: Substitute the underlined word with a more academic alternative	
Mean	12.60507
Median	10
Mode	6
Standard Deviation	8.494694
Skewness	0.593168
Minimum	0
Maximum	30
Count	276

Table 5: Students' performance at the exam for question 2

Question 2: Match the 2 halves of the sentences	
Mean	12.95289855
Median	14
Mode	24
Standard Deviation	7.299909758
Skewness	0.023839408
Minimum	0
Maximum	24
Count	276

Table 5 shows the descriptive statistics related to question 2 in which the students were required to match two sentence halves. Here, the first half of the sentence ends with an academic word from the AWL. The average mark for this question is 12.95289855 while the medium value of 14 suggests that 50% of the students have scored higher than the average mark which is an indication of better performance. Further, the mode value of 24 claims that most students have scored 24 marks which is the total marks given for this question. Skewness which is closer to 0 suggests that the data distribution is symmetric.

## CONCLUSION

In conclusion, three strategies emerged as the most frequently used: namely, using dictionaries, seeking help from friends, and watching English language entertainment media. In addition, the students have noticeably scored low marks for the vocabulary question which required them to replace a word with an alternative academic word. Thus, the EAP lecturers can introduce effective vocabulary learning strategies to them in order

to facilitate their acquisition of academic vocabulary.

## ACKNOWLEDGEMENT

I would like to extend my gratitude to all the participants who filled the questionnaire and their institute for the support given to me.

## REFERENCES

- Coxhead A., & Nation P. (2001). The specialised vocabulary of English for academic purposes. In Flowerdew, J., & M. Peakock, Research perspectives on English for academic purposes (pp. 252-267). Cambridge: Cambridge University Press.
- Dhanapala K. V. (2007). Focus on language learning strategies of advanced learners in Japan and Sri Lanka. *Journal of international development and cooperation*, 13(1), 153-164.
- Dharmawardene R. P. (2020). Enriching Academic Vocabulary of the Undergraduates in Technological Study

- Stream in Sri Lanka: A Comparative Exploration of the Effectiveness of Virtual Blended and Face-To-Face Modes. Colombo Journal of Multi-disciplinary Research, 5, 67–96.
- Fernando W. (2021). The Potential of Semantic Mapping to Develop the Vocabulary of Second Language Learners. *Journal of New Frontiers in Education and Social Sciences*, 1-13.
- Harmer J. (2015). *The Practice of English Language Teaching*. Essex: Pearson Education Limited.
- Manchanayaka M. (2019). English Vocabulary Learning Strategies of Engineering Science Students. *KALYĀNĪ: Journal of the University of Kelaniya*, XXXIII ( I/II), 46-57.
- Nation I. (2013). Knowing a word. In C. A. Linguistics, *Learning Vocabulary in another Language* (pp. 44-91). Cambridge: Cambridge University Press.
- Schmitt N. (2000). *Vocabulary in Language Teaching*. Cambridge: Cambridge University Press.
- Schmitt N. (2010). *Researching Vocabulary: A Vocabulary Research Manual*. New York: Palgrave Macmillan.
- Weeraratna W., Wijetunge M., & Jayasinghe V. (2017). The Use of First Language in Teaching Second Language Vocabulary to Sri Lankan Undergraduates. 10th International Research Conference, General Sir John Kotelawala Defence University. Rathmalana.



## Students' Positioning in the Classroom: A Case of Undergraduates Learning English as a Second Language in Sri Lanka

Ekanayake K.K.T.N.<sup>1\*</sup>, Dineeka P.A.C.<sup>2</sup>

<sup>\*1,2</sup>The Open University, Sri Lanka

### ARTICLE INFO

#### Article History:

Received Date: 01 July 2022

Accepted Date: 15 September 2022

#### Keywords:

Positioning; ESL classroom; Undergraduates

#### Citation:

Ekanayake K.K.T.N., Dineeka P.A.C. (2022). *Students' Positioning in the Classroom: A Case of Undergraduates Learning English as a Second Language in Sri Lanka*. Proceedings of SLIIT International Conference on Advancements in Sciences and Humanities, (11) October, Colombo, 77 - 81.

### ABSTRACT

This study investigates the impact of positioning of ESL learners in learning English using first year undergraduates at University of Kelaniya. The Positioning Theory introduced by Davies and Harré (1990) provides the basis for the study. This study focuses on investigating how second language learners position themselves in framing the identities when interacting with their teacher and classmates, and the impact of using different seating arrangements (as a type of positioning) in providing language learning opportunities. Participants of this study were 2 lecturers of English and 35 first year undergraduates of Faculty of Humanities, University of Kelaniya. Data for the study were collected from a background information questionnaire, classroom observations, and a focus group interview respectively. The findings of the study showed that students positioned themselves in different ways and it was observed that a least number of students make use of the opportunities in the language classroom. Hence, this study provides insights on the effective use of positioning of students in language classroom specifically in which the role of positioning by the teacher should be diverse, interactive, motivating and learner friendly in the ESL classroom.

\* Dineeka, charanipalangasinghe@gmail.com



## INTRODUCTION

Second language acquisition is a complex process in which both the teachers and learners are expected to confront challenges. The success in the process of second language acquisition depends on various techniques, strategies used by the teachers and on the contribution of learners. The use of theories also assists in understanding language acquisition and to create a successful language classroom. Positioning theory is one of those highlighted theories, which is defined as “the study of local moral orders as ever-shifting patterns of mutual and contestable rights and obligations of speaking and acting” (Harre & Van Langenhove, 1999, p. 1). The concept of positioning enables researchers to further examine social interactions: how persons position themselves and how they are positioned by others within a specific context (Harre & Van Langenhove, 1999, p. 1).

Positioning is a powerful concept of our everyday realities, reflecting on how learners position themselves and how they are positioned by the teacher and colleagues in language classroom. Social constructivism which is developed by Lev Yygotsky also highlights the importance of social interaction in language acquisition. The researchers have experienced the difficulties confronted by the ESL learners as well as the teachers when both were unable to position themselves and be positioned by others positively as well as appropriately. In addition, classroom interaction is essential to English language learners (ELLs) because it can limit or promote students’ engagement and participation. Students’ and teachers’ positioning carry various types of positioning and those types contribute in shaping the identity of learners as well as teachers. Also understanding the use of positioning in language classrooms and its impact help in promoting an effective procedure improving the interaction and class participation and ultimately improve the English language acquisition process of the learners.

Scholars have been using the Positioning Theory of Davies and Harré (1999) as a theoretical framework and a method to analyze the dynamics of classroom discourse, and explain the relationships among language learning and teaching experience, identities, and classroom power and competencies.

Though English language learners position themselves positively or negatively in terms of various factors, it is essential to guide ELLs to position themselves positively while learning their L2 (Alzouwain & Lincoln, 2018). In addition, Leeman (2011) examined how language learners became better learners when positioned as language experts in a language learning classroom, which ultimately improved their self-esteem toward the target language. In this study, learning opportunities in language learning classroom refer to “an access to any activity that is likely to lead to an increase in language knowledge or skill” (Crabbe, 2003, p.18).

Further, researchers have been increasingly concerned about the impact of seating arrangements in the language classroom. In several studies, researchers observed how students actively participated by using verbal language during EFL lessons after changing the classroom seating arrangements. Even some studies prove that the overall awareness of teachers on classroom seating arrangement is not satisfactory. Hence, to study the impact on classroom seating arrangements in providing language learning opportunities needs further investigations.

Literature related to certain aspects of classroom positioning, interaction for ESL learners and teachers is hardly found. This gap is mainly on how specifically ESL learners frame their identity using positioning and their ability to participate, engage in different tasks which are in different interaction patterns and gain the learning opportunities. ESL learners acquire their L2 differently depending on their language background, positioning by teacher and classmates, positioning for self, culture, motivation, gender identity, challenges, and future career goals. Hence, the purpose of this study is to investigate how second language learners position themselves in framing their identities when they position themselves when interacting with their teacher and classmates, and the impact of using different seating arrangements (as a type of positioning) in providing language learning opportunities.

## METHODOLOGY

The present study which adopted a mixed method research approach, aims at identifying how different classroom positioning impact learners’ language learning process. The

participants of the study were 2 lecturers of English and 35 first year undergraduates of Faculty of Humanities, University of Kelaniya. The group of students was following the “English for Humanities” course offered by the Department of English Language Teaching. Data for the study were collected from a background information questionnaire, classroom observations, and a focus group interview respectively. The background information questionnaire was developed to identify the distribution of participants and to answer the first research question. It was also translated into learners’ L1. The gender of the participants, their ethnicity, their medium of study, their academic major and their willingness to participate in the interview were highlighted through the background information questionnaire. The respective classroom was observed for one week using a pre-prepared set of criteria based on the research questions and the data related to the two research questions were obtained. The focus group interview was conducted with a group of 7 students who stated their willingness to participate in the interview. The interview was conducted for 30-35 minutes on pre-prepared questions. The data collected from the background information questionnaire were analyzed using the descriptive statistics and frequency tests. In addition, the qualitative data collected through classroom observations and the focus group interview was analyzed using the thematic analysis.

## RESEARCH QUESTIONS

1. How do second language learners position themselves and frame their identities when interacting with the teacher, colleagues in the language classroom?
2. How do classroom seating arrangements affect language learning opportunities?

## RESULTS AND DISCUSSION

The data collected from mixed method approach was analyzed to derive the final results of the study. The findings depicted that, undergraduates who learn English as a Second Language (ESL) position themselves and their classmates in different ways that benefit their language learning process. Through the views of the participants, it was observed that

positioning limits as well as expands learning opportunities.

### **Research question 1: How do second language learners position themselves and frame their identities when interacting with the teacher, colleagues in the language classroom?**

Participant 1 positions herself as a proficient learner of English and an outgoing learner. She actively interacts with classroom discussions showing her interest in expressing her ideas. “I enjoy asking and answering questions, and I don’t like when the students are silent during discussions” (Participant 1).

Participant 2 appears to be responsible with her class activities as she manages to do her due activities before coming to the class. “I don’t like to be embarrassed in front of the class for not completing activities and I hate to be humiliated in the class” (Participant 2). In addition, participant 2 likes to ask questions from the teacher on behalf of the class. So that, she positions herself as a responsible learner for her classmates. “I feel worry when my friends cannot give correct answers, ask questions from the teacher. So, I try to save my friends” (Participant 2)

Participant 4 is a silent learner who is hesitant to interact with other learners and she tries to distant herself from other students. “I feel comfortable when I’m alone, I believe that I can focus more on the lesson when I’m alone” (Participant 4).

In addition, it was observed that the academic major of these undergraduates and their demographic information affect slightly when the learners try to position themselves in language classrooms. For instance, an undergraduate whose academic major is English, tries to frame her identity as a more confident learner when compared to an undergraduate whose academic major is Sinhala, Sociology or Geography. Also it was noticed that demographical facts such as the residence, family background and the medium of study have an impact on positioning themselves (the undergraduates) and framing their identities in the classroom.

The first research question aimed at investigating how ESL learners frame their identities when interacting with their teachers and colleagues in language classroom. The findings reveal that each learner positions oneself in different ways. Some students frame their identities as fluent users in English,

outgoing persons, matured, responsible individuals, confident and submissive learners. As Norton (2016) views, identity is an important factor to expose a speaker to the target language and the society as well as it is a mean through which the learners can frame their identities. Further Vetter (2010) asserts that positioning is a parameter to identify how learners build their identities in the language classroom.

### **Research question 2: How do classroom seating arrangements affect language learning opportunities?**

In order to answer research question two, individual, pair and group work were used as the seating arrangements.

Participant 2 prefers to mix with the students who represent different communities. It was observed that he was comfortable with the group of students where he can position himself as an interactive and a confident learner among others. "I like to talk to friends from different nationalities. It is easy for me to study with them" (Participant 2).

Participant 4 showed reluctance to mix with the students who represent different communities. He positioned himself based on the language in the classroom. Participant four expressed his dislike to make a foreign student as his partner because he was anxious about his fluency in English language. "I am afraid to speak in English in front of other students who speak other languages. I don't know English". (Participant 4)

It was also identified that gender plays a significant role in Positioning. When the students are assigned to groups, some of the male students were opposed to accept female students as leaders in their groups. Accordingly, the female students positioned themselves as leaders while the male students had to position themselves as submissive members.

In addition, when the students positioned themselves with the teacher in individual tasks, it was identified that most of the students are reluctant to respond as they were afraid of making mistakes. Thus, those students positioned themselves as powerless.

The second research question aimed at investigating how classroom seating arrangements affect language learning opportunities. The findings suggested that using different types of seating arrangements impact the target language acquisition. With

the use of group, pair and individual tasks, it was identified that the students positioned themselves based on the first language (L1), nationality and gender. In the individual task, mostly the learner's interaction with the teacher was identified as powerless and the powerful as the majority of the students were afraid of making mistakes and reluctant to respond. Also seating arrangements affect both positively and negatively based on the learners' positioning. This further points out that, the most of the ESL learners avoid the opportunities of improving their target language in the language classroom. This was even proved by Kayi-Aydar (2012) in his research study providing that the way students positioned themselves, the way they positioned other students, and how their classroom teachers positioned them affect the learning opportunities and L2 learning practices in ESL classroom. Vygotsky (1980) also showed the importance of grouping and the assistance of More Knowledgeable Others (MKOs) in developing language learning opportunities during the process target language acquisition.

### **CONCLUSION**

The present study examines how positioning of ESL learners provide language learning opportunities in terms of learner identities, and seating arrangements. The findings revealed that students positioned themselves in different ways and it was observed that a least number of students make use of the opportunities in the language classroom. Hence, the positioning of students by the teacher should be diverse, interactive, motivating and learner friendly in the ESL classroom. Further, this study points out the necessity of making teachers aware of positioning in the classroom and the use of different seating arrangements to promote language learning.

### **ACKNOWLEDGEMENT**

We would like to take this opportunity to express our sincere gratitude and appreciation to all the personalities who were always been there to support and encourage us throughout the process of writing this research study; our parents, lecturers and 1st year undergraduates at University of Kelaniya.

## REFERENCES

- Alzouwain H., & Lincoln F. (2018). Positioning of ESL Saudi women and challenges they face while learning English in the United States. *Journal of Higher Education Theory and Practice*, 18(1).
- Crabbe D. (2003). The quality of language learning opportunities. *TESOL quarterly*, 37(1), 934.
- Davies B., & Harré R. (1999). Positioning and personhood. In Harré.R., & Langenhove, L.V. *Positioning Theory*. (pp. 32-52). Wiley-Blackwell.
- Harré R., & Langenhove L. V., (1999). *Positioning theory*. Malden, MA: Blackwell.
- Kayi-Aydar H. (2012). *Negotiating power in the ESL classroom: positioning to learn* (Doctoral dissertation).
- Vygotsky L. S. (1980). *Mind in Society: The Development of Higher Psychological Processes*. Harvard University Press.



## Shift in the Sri Lankan ESL Classroom – An Experiment with Mobile Assisted Language Learning

Sankaja Amaraweera<sup>1\*</sup>

<sup>1\*</sup>Sri Lanka Institute of Information Technology

---

### ARTICLE INFO

#### Article History:

Received Date: 01 July 2022

Accepted Date: 15 September 2022

---

#### Keywords:

Mobile Assisted Language Learning (MALL);  
Phrasal Verbs; English Language Teaching  
(ELT); Mobile Learning

---

#### Citation:

Sankaja Amaraweera. (2022). *Shift in the Sri Lankan ESL Classroom – An Experiment with Mobile Assisted Language Learning*. Proceedings of SLIIT International Conference on Advancements in Sciences and Humanities, (11) October, Colombo, 82 - 86.

---

### ABSTRACT

The young generation of the contemporary world is depended on the omnipresent smart devices Yu (2012). Their advancement has created a range of additional benefits and new means of learning (Chan, 2016). The use of mobile applications for various purposes is commonly experienced in the Sri Lankan context as well. Although frequently used in written and oral discourses, phrasal verbs are subject to be excluded if the correct use of them is challenging for the English as a Second Language (ESL) learners. Therefore, this research intends to inspect the efficacy of teaching Phrasal Verbs via one of the common mobile applications, since it is prevalent in the society. In this empirical study, thirty undergraduates were selected. Pre and post tests were included in it and forty popularly used Phrasal Verbs are used. For the Pre-test, any instructions on Phrasal verbs were not given, but for the Post-test instructions were given. Traditional classroom instructions were given to the controlled group within one hour and the experimental group was guided via the selected mobile application. The results of both the tests were analysed and found that the experimental group outperformed in the Post-test than the other group indicating that the use of mobile applications in the process of teaching English language is an effective resource in instructing on phrasal verbs.

---

\*Sankaja, sankaja.a@slit.lk

## INTRODUCTION

The use of English language in Sri Lanka has a history of more than 210 years, and it prevailed as “part of the culture and identity of Sri Lanka” all these years (Gunsekara, 2010, 11). In the national school syllabus (National Institute of Education, 2017) Phrasal Verbs (PVs) are introduced formally in the school curriculum, from grade 7, starting from simple PVs as “give up, come across and set off”. However, considerable problems regarding the use of PVs exist even at undergraduate level even after they were introduced to the students at school level. Thus, this study will inspect the effectiveness of using the aid of technology (which was not considered at school level) in improving the knowledge of PVs of the undergraduates. Teaching a large number of phrasal verbs (PVs) within a given time in a language classroom can cause various issues to the students as well as teachers. Some such problems can be considered as difficulty in retaining them in memory, students losing interest in the lesson and inefficiency in teaching a large number of phrasal verbs due to time constraints. Thus to overcome these difficulties new methods are needed to be utilized in ESL classrooms. Considering that, in this research, it is hypothesised that using mobile applications in teaching PVs can result positively in the teaching learning process of PVs.

Although there are several issues in teaching this lexical unit, learning and teaching PVs have a considerable importance since they play a major role in the process of second language acquisition (Howarth, 1998). PVs are commonly used in informal and spoken English; however, these are also commonly used in formal and written English (Fletcher, 2005; McCarthy & O'Dell, 2007). They are also “extremely common in English and found in a wide variety of contexts” (McCarthy & O'Dell, 2007). Also, they can be very problematic for students who learn them as a foreign language or as a second language. Thus the use of them is neglected by these users, and they create complexity in semantic and syntactic aspects of utterances (Choorit & Supakorn, 2014).

### Popularity in using the Mobile Applications

Due to the advancement of technology, mobile phones have become a necessity to the

society and they play a vital role in communication and entertainment. They are popular in the society due to several qualities as mobility, portability (Jeng et.al. 2010), convenient learning, easy collaboration with several number of people (Huang et.al., 2010) and their physical characteristics such as size and weight (Alzubi & Sabha, 2013). Thus, being popular, they have been used in many experiments and research including the field of Second Language Teaching. They are in fact considered as potentially powerful learning tools which can be used even in higher education (Yu, 2012). In fact, the modes of learning, traditional learning has been extended to E-learning (learning using a computer and an internet connection) and then has now changed into M-learning (learning with a mobile device and wireless communication) which can be widely used even in domestic scenario (Sharples, 2000). M-learning comprises of three constituents – “mobility of technology, mobility of learners and the mobility of learning process” (El-Hussein & Cronje, 2010).

Several examples of engaging mobile tools in the education field for teaching and learning purpose can be found from literature. Alkhezzi (2016), Jafari and Chalak (2016) and Başal and Yilmaz (2016) used mobile technology (WhatsApp as the tool) in enhancing vocabulary of ESL Learners and found positive results in utilising it in the ESL environment.

Students' motivation can be increased using different mobile applications. Attewell (2004 cited Zayed 2016) highlights that mobile technology can be used to involve reluctant learners engage more in the classroom and allow them to remain more focused in classroom activities. Zayed (2016) developed fifteen such activities which can be delivered via WhatsApp.

Hence, utilising the use of omnipresent smart devices, this research aims to inspect the effectiveness of teaching phrasal verbs via one of the popular mobile applications designed for communication in the Sri Lankan context.

## MATERIALS AND METHODS

The primal aim of this research is to identify the effectiveness of incorporating the mobile application – WhatsApp in the second language teaching environments. For this purpose, forty commonly used phrasal verbs were selected

based on two corpora - The Corpus of Contemporary American English and The British National Corpus. Pre and Post tests were conducted to test the research participants' knowledge on phrasal verbs. Can mobile applications be effectively used in increasing the knowledge of phrasal verbs of the research participants is taken as the research problem of this study. As the mobile tool to incorporate in the ELS classroom for the improvement of the knowledge of PVs, WhatsApp is used in this study. WhatsApp is a mobile application which can be installed in mobile phones which run in Android, IOS, Windows Mobile, Symbian and many more mobile platforms. It allows free messages, unlimited multimedia messages and even calls using internet data connection. Utilising this mobile application gives several additional benefits due to its easy accessibility, user friendliness and its popularity.

## PARTICIPANTS AND THE TESTS

Thirty undergraduates from a Sri Lankan private university were selected as the research participants. They are first year undergraduates who are following English as an auxiliary subject for their Bachelor of Information Technology. Simple random sampling was used in selecting the participants. These students were divided into two groups as the experimental group and the controlled group. The experimental group was given instructions on phrasal verbs with the use of mobile technology and the controlled group was given traditional classroom instructions.

Two tests – pre and post tests were used in this study. The same test paper was used for both tests in order to maintain the same difficulty. The test paper was designed to test the knowledge of PVs of the undergraduates. Forty multiple choice questions were included in it. The validity of the question paper was tested by a pilot study, giving it to 15 students.

For the pre- test students were not given prior instructions in the subject. They had to use their prevailing knowledge on PVs to complete it. The students were then instructed on the PVs using two methods. The controlled group was given traditional instructions while the experimental group was given instructions using the mobile application – WhatsApp. Using the mobile application the students were instructed on the forty PVs throughout eight days. Instructions were sent to the participants

as messages during different times of the day starting at 6 a.m. until 6 o'clock in the evening. These messages included not only texts but pictures, examples and definitions as well. These same instruments were used even with the controlled group however, only the method of delivery was different – authentic and traditional instruction. The pre-test was given to the selected participants of the two groups with the purpose of identifying their prevailing knowledge on PVs. They completed the test within 30 minutes. The controlled group then continued to have their in-class instructions for a period of one and half hours. The same test paper was then again given to the participants on the controlled group.

## RESULTS AND DISCUSSION

Total marks that the students scored for both Pre-tests and Post-tests of the two groups (Controlled and Experimental) were analysed and the difference of the marks for the two tests were calculated. Considering the marks scored for both Pre and Post-tests, the mean values obtained by the controlled group for the Pre and Post-Tests were 20.26 and 21.46 indicating a slight increase after the traditional in-class input. This was 16.8 for the Pre-test and 20.3 for the Post-Test of the Experimental Group showing a significant increase in the retention of PVs.

Table 1: Analysis of the differences of the Pre and Post tests

		N	Mean	Std. Deviation	Std. Error Mean
Controlled Group	1.00	15	1.2000	2.04241	.52735
Experimental Group	2.00	15	3.5333	5.13902	1.32689

These differences of the marks scored for the Pre and Post-Tests for both the groups were then analysed using SPSS statistics 21. Mean value calculated for the Controlled group was 1.2 whereas it is more than 3.5 for the Experimental Group. Considering the Standard Deviation, it is more than 2.04 for the Controlled Group and more than 3.53 for the Experimental Group. This clearly shows that the Experimental group scored more than the Controlled Group indicating that the Experimental Group outperformed the Controlled Group.

Table 02: Comparisons of the Medians of the two groups

Hypothesis Test Summary			
Null Hypothesis	Test	Sig.	Decision
1 The medians of x are the same across categories of group.	Independent-Samples Median Test	.021 <sup>2</sup>	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.  
<sup>1</sup>Exact significance is displayed for this test.  
<sup>2</sup>Fisher Exact Sig.

A hypothesis test was also carried out comparing the Medians of the two groups. As displayed in Table 02 the medians of the two groups are different, indicating that the experimental group improved their knowledge on PVs than the controlled group.

## CONCLUSION

This study confirms the effectiveness of using mobile applications as a resource in the English language teaching and learning process of Sri Lanka due to several reasons. Participants in this study improved their knowledge on PVs irrespective of the mode of input used – Controlled group, traditional, in class teaching and the Experimental group, Mobile assisted language learning; however, based on the post test results, participants of the experimental group who learned PVs through mobile application achieved significantly better than the other group who learned through traditional activities. Thus, this study also confirms that the usage of mobile applications in the ESL classroom can rarely affect negatively in the teaching, if used after careful planning. Large scale studies including large number of participants should be conducted to understand the strengths and weaknesses of the use of mobile applications in the teaching/learning process.

## REFERENCES

- Alkhezzi, F. (2016). The Impact of Mobile Learning on ESP Learners' Performance [Review of The Impact of Mobile Learning on ESP Learners' Performance]. *The Journal of Educators Online-JEO*, 13(12).
- Basal, A., Yilmaz, S., Tanriverdi, A., & Sari, L. (2016). Effectiveness of Mobile Applications in Vocabulary Teaching. *Institute of Education Science*, 7(1).
- Chan, N. (2016). An Investigation into Everyday Language Learning using Mobile Applications [Review of An Investigation into Everyday Language Learning using Mobile Applications]. In MIT LINC 2016.
- Fuxin, Andrew, & Yu. (2012). MOBILE/SMART PHONE USE IN HIGHER EDUCATION.
- Gunasekera, M. (2005). *The Post Colonial Identity of Sri Lankan English*. Katha Publications. (Original work published 2005)
- Huang, Y.-M., Hwang, W.-Y., & Chang, K.-E. (2010). Guest Editorial – Innovations in Designing Mobile Learning Applications. *Educational Technology & Society*, 13 (3), 1–2. 1 ISSN 1436-4522 (online) and 1176-3647 (print). © International Forum of Educational Technology & Society (IFETS).
- Imrose, I. (2013). Phrasal Verbs: A Problem for EFL/ ESL Learners and Suggested Solution. *Thammasat Review*, 16(3), 109-118.
- Jafari, C. & Chalak, A. 2016. The Role of WhatsApp in Teaching Vocabulary to Iranian EFL Learners at Junior High School. *English Language Teaching*, 9(8), 86-92.
- Kroch, A. S. (1979). [Review of The Verb-Particle Combination in English, by B. Fraser]. *Language*, 55(1), 219–224.
- Liu, D. (2011). The Most Frequently Used Phrasal Verbs in American and British English: A Multicorpus Examination. *Tesol Quarterly*, 45(4), 661-668.
- Mccarthy, M., & Felicity O'dell. (2007). *English phrasal verbs in use*. Cambridge University Press.
- Nisbet, D. (2013). Enhancing ESL Vocabulary Development through the Use of Mobile Technology. *Journal of Adult Education*. [https://www.academia.edu/71603156/Enhancing\\_ESL\\_Vocabulary\\_Development\\_through\\_the\\_Use\\_of\\_Mobile\\_Technology](https://www.academia.edu/71603156/Enhancing_ESL_Vocabulary_Development_through_the_Use_of_Mobile_Technology)
- Quirk & Greenbaum (1973) *A University Grammar of English* [w4qz4ro8m9lk]. (n.d.). Doku.pub.
- Sharples, M. (2000). The design of personal mobile technologies for lifelong learning. *Computers and Education*, 34, 177–193.



Zayed, N. M. (2016). Special Designed Activities Application of WhatsApp! English Language for Learning English Language through the Teaching, 9(2), 199.



## Envisioning Biocentrism in the Great Derangement: Climate Change and the Unthinkable

Dr. C.G.Shyamala<sup>1\*</sup>

<sup>1\*</sup>Post-graduate Dept. of English and Research Centre for Comparative Studies, Mercy College, Palakkad, Kerala, India

### ARTICLE INFO

#### Article History:

Received Date: 01 July 2022

Accepted Date: 15 September 2022

#### Keywords:

biocentric, anthropocene, environmental degradation, skepticism, connectivity, lacuna

#### Citation:

Shyamala. (2022). *Envisioning Biocentrism in the Great Derangement: Climate Change and the Unthinkable*. Proceedings of SLIIT International Conference on Advancements in Sciences and Humanities, (11) October, Colombo, 87 - 93.

### ABSTRACT

For several decades, ecological concerns have been addressed in several academic political, and social forums and the rounds of discussions seem irresolute in arriving at a conclusive decision about curbing environmental degradation. Literary expressions have echoed geo-political, socio-economic, religious and cultural concerns to raise consciousness on a plethora of aspects related to interconnectivities framed and formed. In this context, the relationship of artists, and litterateurs to the environment is significant in that it calls for reconsiderations, reflections and responses that posit the need for connectivity to collectively address pertinent issues.

This paper argues that Amitav Ghosh, in *The Great Derangement: Climate Change and the Unthinkable* (2016) advocates a biocentric vision of the universe and he interrogates the efficacy of political, social and economic policies framed globally that have been neither eco-friendly nor triggered the environmental cause, and these predict the Anthropocene. Moreover, the role of writers is insubstantial to contribute to the protection of the environment. While pointing out to this grave lacuna within academia, he also calls for a substantive move to address not only this shortcoming but also garner the efforts of leaders, policy makers, businessmen and scientists. The endeavour should be to dive into the nadir of the factors that accelerate the rate at which the destruction of the environment is

\* Shyamala, cgsm2007@gmail.com

taking place for fear that the proposition may be deferred.

## INTRODUCTION

The gradual but conclusive changes in patterns around human spheres of influence have necessitated a relook into the contribution of people from diverse professions. However, the scant response from several disciplines, negligence and improper decisions have problematised human-nature interface. Social scientists, geologists, the green studies movement, marine biologists, ecologists, and activists have presaged the adverse effects of environmental annihilation. The Anthropocene reiterates the arrival of a new epoch dominated by human activity that has altered the history of the earth. Persistent anthropocentric dispositions and centres of thought have to be contested to announce a biocentric vision of the world.

Amitav Ghosh's literary oeuvre expends on environmental issues that have plagued the biosphere. *The Hungry Tide* (2004) and *Sea of Poppies* (2008) are works that allude to grave environmental concerns. However, in the non-fictional enterprise *The Great Derangement: Climate Change and the Unthinkable* (2016) Amitav Ghosh's concerns with ecological degradation move along a diverse trajectory where he raises questions about writers' scepticism to genuinely take up inherent burning issues that have been either conveniently ignored or remain unconcerned. Ghosh probes the probable reasons for the evasiveness of modern writers in depicting the intensity of environmental crises. Structured into three parts, "Stories", "History" and "Politics", each section deals specifically with the roles of literature, imperialism and the concept of freedom respectively in relation to climate change and its repercussions.

## METHODOLOGY

To substantiate the argument of the paper, the philosophy of deep ecology propounded by Arne Naess, the Norwegian philosopher is elaborated and applied. The fact that humans must change their perception of nature becomes a crucial yardstick in interrogating human-nature interface in the non-fiction work *The Great Derangement: Climate Change and the Unthinkable* (2016) by Amitav Ghosh.

"Deep ecology" and "shallow environmentalism", the two terms coined by Naess propose opposing views of the relation between human beings and nature. While "shallow" ecology is anthropocentric in nature and considers human beings superior enough to dominate the earth, deep ecology advocates a conscious return to nature and instill an ecosophical approach to it. By ecosophy, he proposes a "philosophy of ecological harmony or equilibrium...a kind of wisdom" that is "openly normative, it contains both norms, rules, announcements and hypothesis concerning the state of affairs in our universe" (96). He initiates the principle of biocentrism wherein "all things have an equal right to live and blossom and to reach their own individual forms of unfolding and self-realization within the larger self-realization" (98). This principle declares that as everything is interrelated, if human beings harm nature, they inevitably harm themselves.

## DISCUSSION

Ghosh begins by offering a critique of the role of fiction with respect to climate change. He asserts that contemporary patterns of thinking and imagining resist depicting the truth of climate changes because of the intensity of changes over the years. The need of the hour is to ponder over an essential move to think more about human existence that works collectively rather than individually to bring about concrete solutions to curtail climate change. Though literary fiction has the potential to help think about this shift, it does little barring a few reviews. The power of fiction is so intense, that it can kindle human sensibilities to visualise a world that would sustain and involve all other natural systems.

Sustainability of the environment is not the sole responsibility of a few pioneers or environmental activists but the prerogative of every human being who is interconnected with the biosphere. Moreover, the onus on the writer to expose the inherent contradictions and contrivances cannot be circumvented. Ghosh observes the translocations, migrations, and exploitation of those at the fringes by interweaving a complex of personal accounts, both observed and experienced, in particular historical contexts and records of political interference in the ensuing imbroglio. He adopts a narrative style that vacillates between

true historical and personal accounts documented with accuracy, interspersed with depictions of grave repercussions of environmental degradation.

The biosphere, according to Ghosh is made up of both the biotic and the abiotic elements that have either been exploited or nurtured by humans to suit political purposes. He recognises the deluge that dislocated his family years back to be an “elemental force...an all-encompassing presence that may have its own purposes” and “the urgent proximity of non-human presences, through instances of recognition” that nothing could be taken for granted (Ghosh 2). Moreover, being a South Asian writer, he makes important connections between these problems and colonial exploitation in South Asia, the movement of people, migration and shifts the scope of discussion to the deprived population living at the fringes of the society. The environmental changes correlate with economic, social, cultural and political perspectives that encompass the entire human history and hence, he says, “the climate crisis is also a crisis of culture, thus of the imagination” (12).

He quotes Dipesh Chakrabarty, who in his seminal essay “The Climate of History,” observes that historians will have to review several of their elementary suppositions, stand and procedures in a world where humans have provoked climate change in a way that they have turned into “geological agents, changing the most basic physical processes of the earth” (14). He warns readers that the Anthropocene is a challenge that not only implies that arts and humanities should create awareness about the impending disaster but also that common-sense understanding should work in tandem with prevailing customary activities and extend beyond contemporary culture in general and seek recompense.

It would be appropriate to mention that the most pressing demand that Ghosh makes in the book is that environmental degradation has not caught the imaginative faculty of the writers. The human-induced environmental trepidations conflated by shifting environmental patterns have permanently altered the course of human history and narratives have miserably failed to grapple with the intensity of the situation. This does not in any way mean that writers have failed to raise consciousness among people regarding the adverse consequences of an environmental

calamity leading to apocalyptic envisionings, but “it is almost always in relation to non-fiction; novels and short stories are very rarely to be glimpsed within this horizon. It is as though in the literary imagination climate change were somehow akin to extraterrestrials or interplanetary travel” (5).

Ghosh’s major concern is whether it is impossible to find solutions for problems that are so “unthinkable” that literary forms fall short of probing into them. Since he considers writing the outcome of the unrelenting commitment to human values, truth and society, he believes that the conscience of modern writers has to be shaken. The novel is an important cultural product that possesses the innate capacity to capture the experiences of human beings conflated with complexities, ambiguities and striking differences. It appears that literature has distanced itself from one of the momentous crises today, the perilous environmental situation. He says that though Arundhati Roy and Paul Kingsnorth are excellent story-tellers and keep themselves abreast of climate change and resistance movements respectively, they have not been able to write fiction on issues related to adverse ecological conditions.

In this context, he refers to the Bosnian writer Dzevad Karahasan who believes that an “aesthetics of indifference” has captured the imagination of the twentieth century due to the ceaseless violence and genocides that the world has witnessed (60). It is probable that the silence literature maintains about climate change is the outcome of numbness that has impacted human sensitivity. He fails to understand which factor related to climate change “that the mention of it should lead to banishment from the preserves of fiction?” “How does this situation acquaint us,” he asks, “with the patterns of evasion of contemporary culture?” (14). It appears that imagination is blocked because of the inability of the writer to write fiction about drastic changes that also a part of the culture. The incapacity to cope with the enormity of the crisis has dampened the senses of writers.

While discussing climate change at the London School of Economics, Ghosh refers to issues of migration, history and his experience of writing. He is of the opinion that the greatest challenge that writers in contemporary times face is trying to give voice to the biotic elements, the flora and the fauna that featured

prominently in ancient texts and epics like The Mahabharata. He states: "That is the central literary challenge, to give agency to the non-human, simply because the non-human does not have language. How do you do it? But throughout history, that has been the role of stories" (India News). It is an apathetic view of human encroachment on the biosphere, restricting and rendering voiceless innumerable other species that are devoid of an agency to speak on their behalf.

Rising sea levels, inundation, unprecedented storms and tornadoes have brought only destruction but also affected the lives of the poor who live on the margins of cities, while the rich who live by the shores, move in further to save themselves from the wrath of the sea. Writers do not comprehend the reality of the situation, and the irony is that this era of self-awareness, will henceforth be known as "Great Derangement" (9).

Ghosh elaborates on how corporates build empires near sea shores, defying conventional norms of building structures. Modern architectural plans have replaced tradition and the proliferation of cities like Mumbai, Hong Kong and New York, built near water bodies is evidence of man's proclaimed conquest over nature (48). The experience of generations and indigenous practices have been crushed under modern science. Political, economic and social divide among the nations of the world has resulted in degradation that has levelled itself to the "Anthropocene" (12). The developments have been brought under the critical lens due to the persistent exploitation of large parts of the globe by the industrialised nations.

He elaborates on how certain government and environmental groups take measures to preserve the environment at the expense of the local population. This imbalance between protection of human life and preservation of animal life is exemplified in the Morichjhāpi conflict from 1978 to 1979 where the natives are subjected to violence and forced to settle on an island reserved for wildlife conservation. Similarly, in Gun Island (2019), he describes the irregular weather storms, cyclones, hailstorms, and tornadoes which are the effects of the "changing weather patterns" (263) all over the world that symbolise nature's superiority over men and humans that are depicted as helpless existence against the powerful nature: "The terrific impact of the storm on land as on each outing, horrific sights:

hamlets obliterated by the storm urge; islands where every tree had been stripped of its leaves; corpses floating in the water, half-eaten by animals; villages that had lost most of their inhabitants" (13-14). The onus of the destruction lies in man, but ironically, nature is the new 'predator'.

However, such descriptions are just the tip of the iceberg. The intensity with which these descriptions are made is insufficient to grasp the threatening scenario that Ghosh explains in the section related to the history of countries. Developed countries have exploited the resources of their colonies both natural and human labour. The ecology of these colonies is tampered with to the extent that the imperial approach is naturalised and images of "cruel nature" are unjustly represented to be playing with the lives of the natives.

Rather than interfering with the geopolitics of the world meaningfully, the affluent countries that were imperial powers, thrived on the natural resources of their colonies and are now finding it difficult to admit their erroneous approach and shouldering the responsibility. The Western countries cannot sacrifice the luxurious life they have been leading due to fossil fuels and adopt suitable strategies in maintaining relations with countries accordingly.

From this observation, it could be ascertained that corporates and MNCs maintain connections for the survival of their country's economy and social welfare at the cost of the lives of the people of disadvantaged countries. These factors are completely neglected by writers of the West. In Carbon Democracy: Political Power in the Age of Oil (2011), the political scientist and historian of the Middle East Timothy Mitchell reveals the crisis that would emerge in developed countries if sufficient oil reserves are not supplied because of the heavy demand and the uncompromising stand taken by the oil companies that are forced to comply with obstinacy despite global consequences.

Mitchell expresses concern about "political agency" in the "socio-technical worlds" (8) that distinguish the age of oil from the other eras. He observes that surplus carbon energy in the form of oil is a deciding factor for the modern science of "prices and flows of money" (131), which envisions "long-run growth as something unrestrained by the availability of energy" (140). He warns that if energy politics is

concentrated in the hands of economists, the systematising principle of expansive growth will shape, transform and govern political systems. The point he makes is that oil possesses the power to change the “the mechanics of democracy” (42) in the world.

Another factor that goes in tandem with economic and political pressures and ecological degradation that Ghosh notices is the cultural change that directly influences human interaction and its depiction in literature. The novel has projected the inner recesses of the human mind, not giving much importance to materialistic attitudes or social realities and impulses (23-40). The shift in perception of world economics and power is also reflected in the literary output. The most glaring revelation is cultural submissiveness that has been expressed as the new turn towards psychological probing into the interiors of human perceptions.

The most remarkable shift that corresponds to the noticeable stylistic and thematic deviations in literature is “The Great Acceleration” (106) propelled by the consumption of fossil fuel. The inimitable separation between science and geopolitical issues is evident in the modern age. Ghosh recalls Bernardin de Saint-Pierre who considered himself “primarily a naturalist and saw no conflict between his calling as a writer and a man of science” (94). This attitude is quite alarming because this would later lead to a fissure deeper and sharper (95).

After stating the effects of colonisation that affected both the coloniser and the colonised countries, Ghosh delves into a critical assessment of documents by writers, thinkers, and conferences that have reflected their stand on ecological issues in the writings. Considered a document of abiding significance, the “Framework Convention on Climate Change” brought out in Paris in 2015, is plain rhetoric sugared over the adamant claim that the affluent society is not pressurised to lower the consumption of existing resources and they are not morally responsible for indiscriminate use of the resources (208-10). Discussions on climate change hinder the path to advancement and such a style is a “shimmering screen” that is inconsiderate because the entire issue is a mere “minor annoyance” than a grave issue of utmost urgency (209).

Ghosh contrasts this approach with the letter by Pope Francis “*Laudato Si*” in May 2015. The

Pope criticises the existing paradigms of the era. The Pope criticises the “idea of infinite or unlimited growth” (210). The Pope is “fiercely critical” about growth and development without conscience pricking man’s inner core. Ghosh exposes the differences in approach of the so-called convention that discusses environmental concerns and the Pope where diametrically opposite views are expressed; the former is extremely callous and the latter, which is soul-stirring and appealing.

Rapid industrialisation in the Asian countries is seen as the culprit for the aggravating issue of carbon emission. The Indian corporates have ignored Gandhi’s warning against the proliferation of the industrial sector. Many impoverished groups are exploited and Ghosh quotes Gandhi who mentions: “If an entire nation of 300 million took to similar economic exploitation, it would strip the world bare like locusts’ (150). Human greed is the cause of economic unrest, which would adversely affect economic growth worldwide. Gandhi’s path of simplicity and austerity are as powerful as his principles of ahimsa. Ghosh understands the importance of co-existence, which maintains the balance of the ecosystem. Ghosh moves forward to discuss how religions and communities in the past have always believed in austerity and only consumed what is required.

The adventures of the Gun Merchant, the legendary Bonduki Sadagar in Gun Island is retold to signify the anger of the Goddess that forces him to travel across places and only when he sears to construct a temple for her does her anger subside. This story opens up the possibilities to reflect on the wrath of nature and the concerns of the Goddess who realises the driving motive of human beings, the “quest for profit” (153) that exploits, binds, controls and destroys the ecosystem. The intractable and conscious destruction of the environment or “ecocide” (Bate 102) is the outcome of rapid urbanisation, industrialisation and economic growth at the expense of the ecosystem. Lawrence Buell regards ecocide to be “more serious threat than nuclear destruction” (vii).

The contemporary situation reflects the disinterest by all the sectors that do not adopt the necessary measures to safeguard peaceful coexistence. The efforts of organisations are mere sham. The scenario points out a dishonest engagement with nature that suggests lack of communication and the zeal to act responsibly

to mitigate further environmental degradation. Ghosh is aware of the irresponsible attitude of those in power and he firmly states that greater intensity of emotion and imaginative force are necessary to make rational and historical studies so powerful as to shake the imagination of the masses and make it “thinkable” for them.

Ghosh alludes to the contribution of Mahatma Gandhi, a powerful force behind mass movements to bring people together for a common cause. His determination, responsiveness and the stubborn attitude to bring the multitude together finds no other substitute. His strategies to win over the arrogance of imperial powers and his tactics to effectively communicate with the masses and the British Raj is largely responsible for the success of freedom movement in India. The need of the hour is such a drive that would bring together all the forces to fight for environmental justice.

Writers such as Bankim Chandra Chatterjee and Rabindranath Tagore have held the people together to fight against imperialism. In comparison, writers have not been successful enough in fighting capitalism and environmental degradation. The effectiveness of any movement lies in its ability to confront the situation in such a way that the humanism in people is rekindled. As Naess notes that human beings “not only protect the planet for the sake of humans, but also, for the sake of the planet itself, to keep ecosystems healthy for their own sake”. Ghosh reiterates the need to form mass movements to shake the world of its detached complacency.

He hopes that religious movements that move beyond the borders of nation-state can “acknowledge intergenerational, long term responsibility” (215). He is sceptical that the present structure is capable of “imagining” such changes, hence it is better to think morally and act ethically. It is necessary to reduce the consumption of fossil fuels not only to lower carbon emissions but also to provide for the less privileged. Though it is all about individual success and comfort, ultimately it is the ability to form groups to uphold traditional practices for preserving the environment and remaining conscious for the sake of the ecosystem by recognising the importance of all the intrinsic components in the biosphere. Though Ghosh is apprehensive about a coordinated and effective global response to climate change, he concludes on an optimistic note:

I would like to believe that out of the current struggle will be born a generation that will be able to look upon the world with clearer eyes than those who preceded it; that they will be able to transcend the isolation in which humanity was entrapped during the time of its derangement; they will rediscover their kinship with other beings, and that this vision, once new and ancient, will find expression in a transformed and renewed art and literature. (248).

Ghosh reiterates that a parochial vision of the world would severely affect the biosphere. This echoes Naess’ formulation of a biocentric view of the world where every system within the larger network of systems possesses the right to exist and interact with each other realising individual relationship and the connection with the universal.

## CONCLUSION

Ghosh states that literature will be accused of its involvement with the great derangement and the blind approval of the climate crisis. Several natural calamities are not the subject matter of serious literary fiction, but they get denigrated to other genres such as science fiction or fantasy, which is a grave concern. On a similar note, politics is also deemed a personal moral issue rather than a field of collective action. Such a parochial stance is detrimental for the future. He accuses Western imperialism for accelerating climate change through carbon-based industrialisation and later taking a dubious stand when the colonies aspired to live by standards enjoyed by the Western countries, and they were considered catastrophic. He believes that religion has the power to transcend boundaries and influence beliefs and customs, which could foster closer ties among countries and develop a sense of collective action. Though several countries have contributed diversely to climate change over the years, global warming is the result of the totality of human actions to date. This responsibility cannot be evaded and hence a biocentric stand to sustain the biosphere is the need of the hour.

## REFERENCES

Bate, Jonathan. *The Song of the Earth*. Picador, 2000.

- Buell, Lawrence. Introduction. *The Environmental Imagination: Thoreau, Nature Writing and Formation of American Culture*. Harvard UP, pp. i-x. 1995.
- Ghosh, Amitav. *The Hungry Tide*. Penguin Books, 2004.
- The Great Derangement: Climate Change and the Unthinkable*. Penguin Books, 2016.
- Gun Island. Penguin Books, 2019. India News. "Amitav Ghosh Regrets Environment Was Not a Poll Issue in India." Hindustan Times.
- Mitchell, Timothy. *Carbon Democracy: Political Power in the Age of Oil*. Verso, 2011.
- Næss, Arne. "Shallow and the Deep. Long-Range Ecology Movements: A Summary." *Inquiry*, vol.16, no. 1, 1972. pp. 95-100.



# Law



## Towards a Tailor-Made Legal Structure for Social Enterprises in Sri Lanka

K.M.M.M. Jayathilaka<sup>1\*</sup>

<sup>1</sup>LL.B. (Hons) University of Peradeniya

### ARTICLE INFO

#### Article History:

Received Date: 01 July 2022

Accepted Date: 15 September 2022

#### Keywords:

Social enterprise; legal form; Sri Lanka

#### Citation:

K.M.M.M. Jayathilaka. (2022). *Towards a Tailor-Made Legal Structure for Social Enterprises in Sri Lanka*. Proceedings of SLIIT International Conference on Advancements in Sciences and Humanities, (11) October, Colombo, 95 - 101.

### ABSTRACT

Social enterprises provide effective solutions to social, economic, and environmental problems using business methods and the power of the marketplace. Social enterprises straddle the legal divide between for-profits and non-profits, as they seek to generate wealth while making a strong social impact. Therefore, many countries around the globe have introduced specific legal forms for social entrepreneurs to house their entities and thereby enabling them to fully realise their aspiration of 'do well by doing good'. This research tests whether there is sufficient demand and the appropriate contextual setting in Sri Lanka to justify the introduction of a tailor-made legal form for social enterprises. This research serves the twofold objective of identifying difficulties encountered by social enterprises when operating within the parameters prescribed by existing for-profit and non-profit legal structures and proposing methods to overcome these barriers to establish a thriving social enterprise sector. To that end, primary sources such as statutes and secondary sources such as Hansard reports, consultation papers on amendments to statutes, research papers and journal articles were used. To discover, from a pragmatic perspective, challenges faced by social enterprises in the current legal landscape and solutions to create a favourable legal environment, semi-structured interviews with social entrepreneurs, experts in the field of social entrepreneurship, corporate lawyers and relevant government officers/agencies were

\* Jayathilaka, jayathilakamithila@gmail.com

conducted based on purposive sampling. Research findings reveal that introduction of a specific legal format for social enterprises is the panacea for all barriers, in particular inability to manage unique governance needs, limited access to finance, lack of recognition, legitimacy and deprivation of identity etc. that hinder this sector from reaching new heights.

## INTRODUCTION

Social enterprise can be defined as an organisation with the primary objective of providing innovative solutions to social, economic and environmental problems through an entrepreneurial strategy; its main purpose is not the maximisation of profits but the attainment of these objectives, and therefore surpluses are principally reinvested for those purposes in the business or the community.<sup>1</sup> Governments across the globe make social enterprises a major partner in their development agendas to fast-track the attainment of and to enhance the sustainability of their economic, social, technological, environmental and moral goals. This strategy has proven to be immensely successful, owing to the ability of social enterprises to treat socio-economic maladies such as unemployment, poverty, social exclusion etc. more efficiently than governments, more sustainably and innovatively than non-profit entities and more generously than for-profit entities.

“Social enterprises occupy the middle space on a continuum between conventional for-profit organisations, whose primary mission is to generate profits and develop effective products and services that are valuable to consumers, and non-profit organisations, which do not prioritise profits and are dedicated to promoting common good instead.”<sup>2</sup> They are a self-sufficient category of enterprises, which create large social values by trading goods and services produced by them, unlike non-profit organisations, which rely on donations and grants to create social values, and for-profit organisations, which create small social values sporadically by their surpluses. Therefore,

social enterprises have a fundamentally different identity from for-profit and non-profit entities. It is a hybrid organisation, which blends norms, rules and institutional features attached to conventional for-profit and non-profit organisational structures.

However, in Sri Lanka, there is, presently, no discrete legal form for social enterprises, which is designed to reflect its hybrid nature. The current legal landscape offers social entrepreneurs an ‘either –or’ choice between for-profit legal forms and non-profit legal forms to house their entities. To attain legal validity for their organisations, social entrepreneurs use the following for-profit and non-profit legal structures:

- a) Sole proprietorship under section 2 of the Business Name Registration Ordinance No.06 of 1918
- b) Partnership under Partnership Act of 1890
- c) Society under Societies Ordinance No. 16 of 1891
- d) Company limited by shares under section 27 of the Companies Act No.7 of 2007
- e) Company limited by guarantee under section 32 of the Companies Act No.7 of 2007
- f) Trust under Trusts Ordinance 1917

This study focuses on gauging the ability of these legal structures to facilitate special characteristics and operational needs of social enterprises to realise their full potential and thereby positively contribute to achieving the country's development goals. To that end, this study demonstrates challenges faced by social entrepreneurs in operating within the parameters of legal forms, which either belong to for-profit legal camp or non-profit legal camp, despite their hybrid nature and provides solutions to overcome these barriers, which lie in their road to success.

The research commissioned by Lanka Social Ventures<sup>3</sup> provides valuable insights into the menu of legal forms available for social enterprises in Sri Lanka. Without any precise mention of hardships faced by social

<sup>1</sup> Alina Ball, ‘Social Enterprise Governance’ (2016) University of Pennsylvania Journal of Business Law < <https://scholarship.law.upenn.edu/jbl/vol18/iss4/1/> > accessed 21 March 2021, p.g. 925.

<sup>2</sup> M. Kaplan, ‘Growing the Next Generation of Social Entrepreneurs and Start-ups in New Zealand’ (2013) < [https://www.fulbright.org.nz/wp-](https://www.fulbright.org.nz/wp-content/uploads/2013/08/axford2013_kaplan.pdf)

[content/uploads/2013/08/axford2013\\_kaplan.pdf](https://www.fulbright.org.nz/wp-content/uploads/2013/08/axford2013_kaplan.pdf) > accessed 21 March 2021, p.g. 6.

<sup>3</sup> Lanka Social Ventures, ‘The State of Social Enterprises in Sri Lanka’ < <https://www.socialenterprise.org.uk/international-reports/the-state-of-social-enterprises-in-sri-lanka/> > accessed 21 September 2020.

entrepreneurs under current legal arrangements, it recommends introducing a specific legal format to capture the hybrid nature of social enterprises. The research study commissioned by Oxfam in collaboration with IIX Shujog<sup>4</sup> and C. Mallawarachchi<sup>5</sup> claims that a tailor-made legal form could streamline the pathway for social enterprises in Sri Lanka to reach new heights by removing roadblocks, in particular, limited avenues to raise capital. These studies do not clearly portray whether there is sufficient demand and the appropriate contextual setting in Sri Lanka to justify the introduction of a tailor-made legal form for social enterprises. Previous studies have paid attention only to hindrances, in terms of access to finance, faced by social entrepreneurs in operating within the parameters of current legal models. These studies did not attempt to holistically identify challenges confronted by the social enterprise sector, for which the present study seeks to contribute. The present study identifies legal barriers impeding operations of the social enterprise sector at all four phases of a business life cycle: start-up, growth, maturity and renewal or decline.

## METHODOLOGY

The qualitative research method is employed to conduct this research. Primary sources such as statutes and government policy documents were used to identify the legal forms currently used by social entrepreneurs to house their organisations. Secondary sources such as Hansard reports, consultation papers on amendments to the statute, research papers and journal articles were used to theoretically explore difficulties social enterprises encounter in operating within the parameters of legal forms either belonging to for-profit legal camp or non-profit legal camp. To discover, from a

pragmatic perspective, challenges faced by social enterprises based on the legal divide in the current menu of legal forms and methods to create a favourable legal environment for social enterprises, semi-structured interviews with social entrepreneurs, experts in the field of social entrepreneurship, corporate lawyers and relevant government officers/agencies were conducted based on purposive sampling.

## DISCUSSION

### Challenges Associated with Existing Legal Structures.

#### 1.1. Governance Challenges

Legal scaffoldings currently available in the country, which either belong to for-profit legal camp or non-profit legal camp, do not provide adequate guidance on “balancing the enterprise’s profit-making endeavours with furthering enterprise’s social objectives, when the two conflicts or when furthering one may impede progress toward the other.”<sup>6</sup> This leads to the dilemma of mission drift, which commonly can be observed with social enterprises incorporated under company limited by shares category.<sup>7</sup> Unlike in United Kingdom<sup>8</sup>, in Sri Lanka, neither the Act nor the judiciary provides any guidance concerning the nature of the duty imposed on directors by section 187 of the Companies Act 2007.<sup>9</sup> There is considerable uncertainty on whether acting in the best interest of the company necessitates directors to maximise financial returns for shareholders or, whether directors are allowed to make business choices consistent with the social mission at the expense of generating higher financial returns for shareholders. Therefore, the risk of liability or removal prevents directors of a for-profit social

<sup>4</sup> Oxfam and IIX Shujog, ‘Sri Lanka- Social Enterprises Needs Assessment and Advisory’ <https://iixglobal.com/download/sri-lanka-social-enterprise-needs-assessment-advisory-2014/> accessed 21 September 2020.

<sup>5</sup> Chamila Mallawarachchi, ‘Civil Society in Sri Lanka’ <https://www.adb.org/sites/default/files/publication/31161/csb-sri-lanka.pdf> accessed 21 September 2020.

<sup>6</sup> Alnoor Ebrahim, Julie Battilana and Johanna Mair, ‘The governance of social enterprises: Mission drift and accountability challenges in hybrid organizations’ (2014) <https://www.hbs.edu/faculty/Pages/item.aspx?num=47977> accessed 23 April 2021, p.g.85.

<sup>7</sup> Interview with Mr. Bandara, Director of Department of Cultural, Tourism, Trade and Commerce affairs, Central Provincial Council – Sri Lanka (Kandy, 28 March 2021).

<sup>8</sup> In accordance with section 172 of the Companies Act of the United Kingdom, shareholder wealth maximization is the standard that directors should observe in exercising the duty to act in the best interest of the company.

<sup>9</sup> Section 187 of Companies Act No. 7 of 2007 – Duty of directors to act in good faith and for the best interest of the company. Neither the wording of section 187, the interpretation section nor the preamble to the Act identify who constitutes the ‘company’ for the purposes of determining best interests and no specific purposes are given in the Act for which directors’ duties are to be exercised.

enterprise from making business choices consistent with the social mission at the expense of generating higher financial returns for shareholders. As a consequence of the risk-averse behaviour of directors, social enterprises would be unlikely to retain their hybrid nature; they would, over time, drift toward the business goals and away from their social missions.<sup>10</sup>

Financial and social impact transparency and accountability are vital for social enterprises to ensure their sustainability, resilience and success, and to curb opportunities for people with bad faith to commit frauds and scandals.<sup>11</sup> However, present legal regimes on for-profit and non-profit organisations only require to disclose information on decision-making processes and achievements about financial goals of an enterprise through financial audits; laws do not require to regularly and critically examine social value creation efforts of enterprises through social impact reporting.<sup>12</sup> Due to a lack of measurements on social impact, the use of internal and external accountability mechanisms is less likely in social enterprises with for-profit and non-profit legal formats. Moreover, the standing of accountability enforcement mechanisms of for-profit entities such as derivative actions, restraining orders, mismanagement and oppression are limited to shareholders and directors; shareholder centric governance approach of for-profits undermines the core value of social enterprises: stakeholder-centric governance.

## 1.2. Difficulties in accessing finance

Social enterprises face immense difficulties in tapping financial resources to survive and to go to scale because availability of financial instruments to raise capital is heavily

dependent on the type of legal format chosen by the enterprise. Investors are discouraged from funding social enterprises with non-profit legal formats, on account of their obligation to lock profits into the charitable purpose completely or on limited profit distribution among investors. Non-profit enterprises can rely on debt financing, but debt instruments tend to be more expensive and less flexible than equity; “lenders are reluctant to make loans to non-profits on competitive terms because the ability of non-profits to repay is constrained by lack of access to a pool of diverse financial instruments and the existence of an asset lock mechanism.”<sup>13</sup>

The launch of the social enterprise as a for-profit entity is not a proper cure to the access to the capital problem. It is difficult to attract capital from investors, which is the ordinary source of capital for for-profits, as they are deterred by “the fact that social enterprises have another interest on their agenda besides generating a proper return for investors.”<sup>14</sup> Philanthropists are reluctant to finance for-profit social enterprises due to the high due diligence cost attached to making such grants; owing to the deep-seated perception that for-profit enterprises exist purely to make money, philanthropists closely oversee whether a for-profit recipient uses the funding exclusively for the purpose specified in the corporate constitution, with the hope of saving their tax exemption status.<sup>15</sup> Though for-profit organisations can borrow money, most of the lenders are reluctant to provide loans, because “lenders often assume loans cannot be repaid, even though the business does have the capacity to repay, given the unfamiliar balance sheets where profits are reinvested in pursuit of public benefit.”<sup>16</sup>

<sup>10</sup> Interview with Sthree Cafe Women’s Initiative ( Kandy, 28 March 2021); interview with Mr. Sagara Liyanage, CEO of Earthbound Creations (Pvt.) Ltd ( Kandy, 12 April 2021).

<sup>11</sup> Interview with Mr. Bandara, Director of Department of Cultural, Tourism, Trade and Commerce affairs, Central Provincial Council – Sri Lanka (Kandy, 28 March 2021); Interview with Mr. Anushka, Chairman of National Enterprise Development Authority ( Colombo, 4 April 2021).

<sup>12</sup> Interview with Ms. Savindhi Manthilaka, Managing Director of Green Life Generation Private Limited (Kandy, 23 April 2021); Akina Foundation, ‘A New Legal Structure for Social Enterprise in New Zealand’ <<https://www.lawsociety.org.nz/news/lawtalk/issue-910/social-enterprises-and-legal-structure-options-in-nz/>> accessed 17 April 2021, p.g. 10.

<sup>13</sup> Interview with Mr. Marasinghe, Chairman of Sarvodaya Suwasetha Sewa Society ( Colombo, 23 March 2021);

Interview with Mrs. S. Kiriwandeniya, Managing Director of SANASA International ( Colombo 4 April 2021); Thomas Kelley, ‘ LAW AND CHOICE OF ENTITY ON THE SOCIAL ENTERPRISE FRONTIER’ (2009) <

[https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1372313](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1372313) > accessed 21 April 2021, p.g. 14-17.

<sup>14</sup> L. Timmerman, J.M. de Jongh & A.J.P. Schild, ‘The Rise of the Social Enterprise: How Social Enterprises Are Changing Company Law Worldwide’ (2011) <

[https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1795042](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1795042) > accessed 21 April 2021, p.g. 7.

<sup>15</sup> Interview with Mr. Vikum Rajapakshe, Managing Director of Kantala Private Limited ( Colombo, 4 April 2020).

<sup>16</sup> Interview with Mr. Sagara Liyanage, CEO of Earthbound Creations (Pvt.) Ltd ( Kandy, 12 April 2021).

Experts in social entrepreneurship claim that patient capital such as mission-related investment, programme-related investment and social impact bonds etc. are the ideal match for social enterprises to pursue their dual aspirations, which is not easy to find in Sri Lanka. They believe that the absence of quality corporate governance mechanisms and lack of brand recognition for social enterprises lead impact investors to overestimate the risks involved with his/her capital.<sup>17</sup>

### 1.3. Lack of Recognition, Legitimacy and Deprivation of Identity

A tailor-made legal structure can confer social enterprises an identity in law and legitimacy to their activities. Instead of hiding the hybrid nature of social enterprises behind a veneer of 'business as usual' or under a halo of selflessness, it enables clear communication of its distinctive features and validity before the law.<sup>18</sup> This 'signalling effect' in the market aids social enterprises to gain trust and convince "contributors of capital to invest in their brand, employees to involve in social enterprises, government institutions to collaborate with social enterprises, and the broader public to value it."<sup>19</sup> This will reduce the due diligence cost for stakeholders and ease access to the right financial, technical support etc. A specific legal form will enable to build of a strong organisational culture to maintain accountability for potentially conflicting objectives (social and financial) and to engage in participatory governance by stakeholders with divergent interests. Moreover, a discrete legal form enables social enterprises to, rightly, position themselves as the fourth sector within the overall economy and provide a competitive advantage concerning access to finance, access

to domestic and international markets, availability of collaborations and incentives of private and government market actors and involvement of employees and customers.

The absence of a specific legal structure can place the social enterprise brand in danger of being abused. Operations in an unregulated environment render social enterprises vulnerable to 'social washing'.<sup>20</sup> Further, prevention of the creation and operation of 'false' social enterprises is imperative, because these entities could be breeding grounds for money laundering, terrorist financing and human trafficking.

### CONCLUSION AND RECOMMENDATIONS

As a result of social entrepreneurs being forced to "box themselves into existing organisational forms by legally incorporating as either non-profit or for-profit organisations, despite the hybrid nature of social enterprises,"<sup>21</sup> social enterprises encounter challenges such as the inability to manage unique governance needs, limited access to finance, lack of recognition, legitimacy and deprivation of identity etc. Accordingly, it is evident that current legal forms are ill-suited for social enterprises to achieve their multiple bottom-line aspirations; the lack of appropriate legal scaffoldings poses serious threats to the creation of a flourishing social enterprise sector in Sri Lanka.

A new legal model designed to reflect the unique nature of social enterprises is the simplest and most effective means of overcoming the challenges discussed above. The tailor-made legal structure for social enterprises should premise on the company limited by shares structure<sup>22</sup> and should contain the following elements:

<sup>17</sup> Interview with Mr. Jonathan, Lanka Impact Investing Network (Colombo, 4 April 2021).

<sup>18</sup> Dana Reiser, 'Theorizing Forms for Social Enterprise' (2012) BROOKLYN LAW REVIEW <  
<https://scholarlycommons.law.emory.edu/elj/vol62/iss4/1/>> accessed 17 April 2021, p.g. 8.

<sup>19</sup> Ibid, p.g.21.

<sup>20</sup> Akina Foundation, 'A New Legal Structure for Social Enterprise in New Zealand' <https://www.lawsociety.org.nz/news/lawtalk/issue-910/social-enterprises-and-legal-structure-options-in-nz/>> accessed 17 April 2021, p.g. 23; interview with Sthree Cafe Women's Initiative (Kandy, 28 March 2021); interview with Mr. Sagara Liyanage, CEO of Earthbound Creations (Pvt.) Ltd (Kandy, 12 April 2021).

<sup>21</sup> Kevin Levillain, Blanche Segrestin and Armand Hatchuel, 'Is law normalizing Hybrid Organizations? Putting profit-with-purpose corporations into historical perspective' (2017) <  
<https://hal-mines-paristech.archives-ouvertes.fr/hal-01497085/document>> accessed 20 April 2021, p.g.23.

<sup>22</sup> There is a high inclination among social entrepreneurs towards using the company model to establish their organizations; due to values of the company model such as ease of formation, limited liability, financial accounting and oversight of the Registrar of Companies, social entrepreneurs of Sri Lanka prefer the company model; interview with Dr. Lalith Welamedage, Co-founding director and CEO of Lanka Social Ventures (Colombo, 26 October 2020).



### Asset lock

An asset lock is a legal clause that prevents the assets of a company from being used for private gain rather than the stated purposes of the organisation; an asset lock comprises two mechanisms: dividend cap and restricted distribution of assets. A maximum aggregate dividend cap of 35% ensures that at least 65% of profits are reinvested into the company or used for the community to which the company intends to benefit. Distribution of assets should be restricted by prohibiting the sale of any assets below market value, transferring assets only to asset-locked bodies and requiring directors to certify that any distribution of assets is intended to further the social enterprise's social purpose.

### Mission lock

The new legal format must make it a mandatory requirement to specify the public benefit purpose/s in its Articles of Association and shareholder certificates, which will be evaluated via a mechanism similar to the community interest test in the Community Interest Company legal model in the United Kingdom. This should be supplemented by a provision, which allows changing the public benefit purpose by a special resolution or unanimous assent together with the approval of the Regulator to ensure the continuity of the purpose.

### Director's duties and protections

It is imperative to redefine and expand the director's duty in the new legal form. Therefore, the new legislation should describe types of interests that the directors are required to consider or balance and it should specify particular interests that are to be prioritised in any event of a conflict of interests, without leaving it to the discretion of the director, as is done by section 172(2) of the United Kingdom Companies Act 2006.

### Reporting requirement

A new legal model should be required to conduct social audits along with financial audits and should provide guidance on the contents of the social impact report and the manner of

reporting the contents, due to the risk of these reports being used as self-promotional tools.

Legislation on the new legal form should create an independent regulatory body modelled on the Office of the Regulator of Community Interest Companies United Kingdom to decide whether an organisation is eligible to become, or continue to be, a social enterprise, to provide guidance and assistance to set up a social enterprise under the new legal form, to scrutinise the compliance with legal obligations and to take enforcement actions where serious infringements occur.

Social enterprises may encounter hardships with regard to access to capital, even if the new legal form is introduced because the social capital market (impact investment, social impact bonds etc.) of Sri Lanka has still not reached a sufficient level of maturity, which is required to cater for capital requirements of social enterprises.<sup>23</sup> Therefore, "tax incentives for investors to engage with something unknown and, therefore, perceived to be riskier, especially where the expected return is below market rate,"<sup>24</sup> similar to Social Investment Tax Relief in the UK, should be made available; it allows them to compete in traditional commercial investment markets.<sup>25</sup>

<sup>23</sup> Interview with Mr. Jonathan, Lanka Impact Investing Network (Colombo, 4 April 2021).

<sup>24</sup> Steven Moe, 'Social Enterprises in New Zealand: A legal handbook' <

<https://community.net.nz/assets/resources/social-enterprises-in-NZ.pdf> > accessed 21 April 2021, p.g. 58.

<sup>25</sup> Interview with Dr Lalith Welamedage, CEO of Lanka Social Ventures (Colombo, 4 April 2021).

## REFERENCES

- Akina Foundation, 'A New Legal Structure for Social Enterprise in New Zealand' <<https://www.lawsociety.org.nz/news/lawtalk/issue-910/social-enterprises-and-legal-structure-options-in-nz/>> accessed 17 April 2021
- Ball, A., 'Social Enterprise Governance' (2016) University of Pennsylvania Journal of Business Law <<https://scholarship.law.upenn.edu/jbl/vol18/iss4/1/>> accessed 21 March 2021
- Ebrahim, A., Battilana, J., and Mair, J., 'The governance of social enterprises: Mission drift and accountability challenges in hybrid organizations' (2014) <<https://www.hbs.edu/faculty/Pages/item.aspx?num=47977>> accessed 23 April 2021
- Kaplan, M., 'Growing the Next Generation of Social Entrepreneurs and Start-ups in New Zealand' (2013) <[https://www.fulbright.org.nz/wp-content/uploads/2013/08/axford2013\\_kaplan.pdf](https://www.fulbright.org.nz/wp-content/uploads/2013/08/axford2013_kaplan.pdf)> accessed 21 March 2021
- Kelley, T., 'LAW AND CHOICE OF ENTITY ON THE SOCIAL ENTERPRISE FRONTIER' (2009) <[https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1372313](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1372313)> accessed 21 April 2021
- Lanka Social Ventures, 'The State of Social Enterprises in Sri Lanka' <<https://www.socialenterprise.org.uk/international-reports/the-state-of-social-enterprises-in-sri-lanka/>> accessed 21 September 2020
- Mallawarachi, C., 'Civil Society in Sri Lanka' <<https://www.adb.org/sites/default/files/publication/31161/csb-sri-lanka.pdf>> accessed 21 September 2020
- Oxfam and IIX Shujog, 'Sri Lanka- Social Enterprises Needs Assessment and Advisory' <<https://iixglobal.com/download/sri-lanka-social-enterprise-needs-assessment-advisory-2014/>> accessed 21 September 2020
- Reiser, D., 'Theorizing Forms for Social Enterprise' (2012) BROOKLYN LAW REVIEW <<https://scholarlycommons.law.emory.edu/elj/vol62/iss4/1/>> accessed 17 April 2021
- Timmerman, L., Jongh, J.M. de., & Schild, A.J.P., 'The Rise of the Social Enterprise: How Social Enterprises Are Changing Company Law Worldwide' (2011) <[https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1795042](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1795042)> accessed 21 April 2021





## UK Constitution: Should it be Codified

Chaga Bihari Mahingoda<sup>\*1</sup>

### ARTICLE INFO

#### Article History:

Received Date: 01 July 2022

Accepted Date: 15 September 2022

#### Keywords:

British Constitution; Codified Constitution;  
Uncodified Constitution

#### Citation:

Chaga Bihari Mahingoda. (2022). *UK Constitution: Should it be Codified*. Proceedings of SLIIT International Conference on Advancements in Sciences and Humanities, (11) October, Colombo, 102 - 111.

### ABSTRACT

A Constitution is a vital part of a State, as it encompasses the fundamental principles and rules upon which a state exists. Considering the Constitution of the United Kingdom (UK) and the Constitution of Sri Lanka, there is an apparent difference: Sri Lanka operates upon the powers derived from a Codified Constitution, whereas the UK does not have a Codified Constitution but rather an array of legislation, judge-made laws and regulations. The system of laws and regulations within the UK has been encompassed in an Uncodified Constitution. Several academics and organizations have advocated for the codification of the British Constitution based on a balance of the power of the executive, stability, and clarity hoping to provide a clearer and more straightforward arrangement of the fundamental rules and principles according to which the state is established and governed. However, other scholars have contested it on the basis that it would make the Constitution conservative and anti-rationalist, and that it would be a rather disruptive process. The EU referendum in 2016, the EU withdrawal and other reforms have further added to this debate. Within this article, we closely observe and dissect the ongoing debate on the codification of the UK Constitution.

<sup>\*</sup> Chaga, chagabiharimahingoda@gmail.com

## INTRODUCTION

The expression, "Constitution", is generally used to refer to a system of legal and political rules that would regulate the functions of a government and control how the nation would operate, as well as the relationship linking the state and its inhabitants<sup>26</sup>. House of Lords Select Committee on the Constitution explained the term "Constitution" as "the set of laws, rules and practices that create the basic institutions of the state and its component and related parts and stipulate the powers of those institutions and the relationship between the different institutions and between those institutions and the individual<sup>27</sup>". In other words, a Constitution simultaneously establishes, authorizes, and limits the bodies that govern the social order. The UK is widely known for its Uncodified Constitution, which has been subjected to ample scrutiny over the years. Some academics question whether changes need to be made to the current approach to the Constitutional framework within the UK and whether it should be codified<sup>28</sup>. Within this research, the reader shall be able to get an in-depth view of these issues.

## MATERIALS AND METHODS

The objective of the research is to observe and study the debate ongoing debate on whether the UK constitution should be codified and present the author's stance on it. The current driven hypothesis on the UK Constitution is: that its uncodified nature is satisfactory on the surface however, further codification might be essential. Through this research, the reader can get an in-depth view of the current framework of the UK Constitution.

This study was conducted in the format of qualitative research. The research uses primary legal sources such as legislation and provisions of the Constitution within the jurisdiction of the UK. Secondary legal sources for this study consist of journals and research available on data collection tools such as online sites, for

example, Westlaw, Lexis and Google Scholar. The research had to be conducted entirely online due to limitations that the current situation, within Sri Lanka, has caused.

## The Uncodified Constitution

Unlike most nations like Sri Lanka which have Codified the laws of the Constitution into a written document, the UK lacks a sole legal document outlining the rules contained within the Constitution. However, the fact the laws are unwritten does not insinuate that the UK lack a Constitution, but rather, as academics refer to it, the UK has an "Uncodified" Constitution. As Ivor Jennings claimed, "If a Constitution means a written document, then obviously Great Britain has no Constitution...But the document itself merely sets out rules...The phrase 'British Constitution' is used to describe those rules."<sup>29</sup>

Vernon Bogdanor expanded that "The essence of the British Constitution is ... better expressed in the statement that it is a historic Constitution whose dominating characteristic is the sovereignty of parliament than in the statement that Britain has an unwritten Constitution", highlighting the flexible nature of the British Constitution, allowing the parliament to modify and adjust provisions easily<sup>30</sup>. House of Lords Select Committee on the Constitution 2002 also rationalized that the British Constitution is not 'unwritten but rather, it is Uncodified. To put it in plain words, the laws of the Constitution have been composed but have not been assorted into a systematic code.

The academic Blick suggested that this uncodified nature of the Constitution could be a result of the lack of a defining historical event within Britain such as a revolution or gaining independence from the rule of another country, initiating Britain to reform the Constitution to the degree of codifying it into a single document<sup>31</sup>.

## Sources of British Constitutional Law

<sup>26</sup> Beatson, J. "Reforming an unwritten Constitution". Law Quarterly Review, (2010). 48: 1-17.

<sup>27</sup>House of Lords, "Select Committee on Constitution First Report", (July 2001), <

<https://publications.parliament.uk/pa/ld200102/ldselect/ldconst/1/11106.htm> > [ accessed date 03/29/2022]

<sup>28</sup> AC Grayling, 'Why the UK Needs a Written Constitution' in DJ Galligan (ed), Constitution in Crisis: The New Putney Debates (IB Tauris 2017).

<sup>29</sup> Jennings, "The Law and the Constitution", (1959) 5th edn.

<sup>30</sup> Vernon Bogdanor, "The New British Constitution" (2009).

<sup>31</sup> Blick, A. "Codifying-or not codifying- the UK Constitution: A literal Review. Centre for Political and Constitutional Studies, Kings College London." (2011). 4-32.

The British Constitution is an accumulation of statutory law, common law, royal prerogative, work of authority, legislation of the European Union and conventions. In addition, the British Constitution is also built upon historical traditions, culture, customs, political practices and historic documents such as the Magna Carta. The progression of the British Constitution dates all the way back to 1215 with Magna Carta being the first official documentary evidence of the establishment of liberties and the democracy of the society. The British Constitution has been constantly evolving<sup>32</sup> due to its Uncodified and uncemented nature, in theory making it very flexible and easy for the parliament to revise and the government to amend any of its provisions. Professor Ringen called the British constitution a “complex and evolving living organism”<sup>33</sup>.

Conventions are also a significant non-legal part of the UK Constitution. Although courts cannot sanction the provisions of a convention due to its non-legal nature, conventions are widely respected and recognized within the political domain. Dicey defined conventions as: “understandings, habits or practices which, though they may regulate the ... conduct of the several members of the sovereign power... are not in reality laws at all since they are not enforced by the courts”<sup>34</sup>. The doctrine of parliamentary supremacy, together with the rule of law and conventions, is the foundation of the UK’s unwritten constitution.

### Constitutional Text versus the Constitutional Order

Constitutional text refers to the written bylaws and quasi-legal instruments, most often referring to the official charter of a nation. The declaration of independence or a republic proclamation can also be considered a

Constitutional text. The Constitutional text is the written text which is the nominal Constitution. Whereas Constitutional order is much broader than just the Constitutional text. It concerns a wider range of features such as laws, customs, conventions, theories, norms, traditions, administrative structures, and interpretations. The academic Yash Ghai explained that the Constitutional order represents a “fundamental commitment to the norms and procedures of the Constitution. It has more to do with behaviour, practice, and internalisation of norms than Constitutional text”<sup>35</sup>. The Constitutional order encompasses all regulations or theories that aim to achieve the function of limiting the power of the government, detailing the outlines of authority and assembling government institutions.

The Constitutional text by itself is wholly inadequate to describe the Constitutional law of a nation as it is only one element of the Constitutional framework. The Constitutional order is necessary for an individual to understand the Constitution of the UK. However, this also has resulted in nearly 80% of UK citizens having very trivial knowledge about the UK Constitution as the Constitutional text contains an insufficient amount of information<sup>36</sup>. This less accessible and unintelligible nature of the Uncodified Constitution happens to be one of its shortcomings compared to a Codified Constitution.

### Arguments For and Against the Codification of the UK Constitution

With the acts such as the Human Rights Act<sup>37</sup>, the Constitutional Reform Act<sup>38</sup>, the European Union (herein referred to as EU) referendum in 2016, House of Lords Reform Act<sup>39</sup>, House of Lords (Expulsion and Suspension) Act<sup>40</sup>, EU (Withdrawal) Act<sup>41</sup> and EU (Future Relationship)

<sup>32</sup> Bevir, M. and Rhodes, R.A., “Searching for civil society: changing patterns of governance in Britain.” (Public Administration, 2003) 81(1), pp.41-62.

<sup>33</sup> Blick, A. Codifying-or not codifying- the UK constitution: A literal Review. Centre for Political and Constitutional Studies, Kings College London. (2011) 4-32.

<sup>34</sup> Barbwe N.W. “Law and Constitutional Conventions” (2009).

<sup>35</sup> Ghai, Yash, ‘Chimera of Constitutionalism: State, economy and society in Africa’, lecture, 2010, available at <

<https://www.up.ac.za/media/shared/Legacy/sitefiles/file/47/15>

[338/chimera\\_of\\_Constitutionalism\\_vg1.pdf](#) > [accessed date 04/10/2022]

<sup>36</sup> Ipsos Mori. “Audit of Political Engagement 5: The 2008 Report with a special focus on the Constitution”. London: Hansard Society. (2008).

<sup>37</sup> Human Rights Act of 1998

<sup>38</sup> Constitutional Reform Act of 2005

<sup>39</sup> House of Lords Reform Acts 2014

<sup>40</sup> House of Lords (Expulsion and Suspension) Act 2015

<sup>41</sup> European Union (Withdrawal) Act 2018

Act<sup>42</sup> the discussion on whether Britain should adopt a written Constitution has been a significant topic of conversation<sup>43</sup>. The process of Brexit has caused a crisis<sup>44</sup> in relation to the unwritten constitution and left it in a molten condition as stated by Andrew Blick and Peter Hennessy<sup>45</sup>. Balance of the power of the executive and the legislature, stability, and clarity have been some of the pinpointed reasons for individuals to consider recommending the codification of the British Constitution<sup>46</sup>.

Academics<sup>47</sup> debate that Britain has a broken and outdated First-Past-The-Post electoral system which only worked when Britain had only two wide-ranging social classes. However, currently, this system doesn't work as there are more than 2 social classes due to concepts like immigration, de-industrialization and occupational diversity. This dysfunctional election system deteriorates the capability of the parliament to act on and consider diverse public opinion, diminishing the accountability of Parliament to the people. Thus, codification is suggested for electoral reform, such as replacing the first-past-the-post voting system with proportional representation<sup>48</sup>.

Two of the central doctrines of the Uncodified British Constitution are parliamentary supremacy and the separation of powers, which clarifies that the Parliament would be the highest source of law in the UK and act as a check and balance for the Government<sup>49</sup>. Nonetheless, in reality, there is a lack of complete separation of powers between the Executive (government) and Legislature (House of Commons) as the majority of ministers are members of the ruling party<sup>50</sup>. A key feature of the Westminster model makes the executive

(the majority of ministers who are members of the elected party) also a part of the legislature, resulting in a fusion between the executive and legislature, which grants the government excessive power. However, providing the government such power, weakens the liability of Parliament to the people, as the current dysfunctional election system has weakened the ability of the parliament to consider diverse public outlooks and undertake action. This can lead to the abuse of power. Therefore, individuals argue that codifying the British Constitution and controlling the power of the executive would restore the balance<sup>51</sup>, preventing incidents like the Great Repeal Bill which proposed to permit ministers to re-write provisions of EU law once these are translated to UK law, without reference to Parliament<sup>52</sup>.

The British philosopher Anthony Clifford Grayling explained that "the government is subject to it, whereas with an unwritten constitution it is the constitution which is subject to the government; the government can choose to alter it or interpret it in ways that suit itself. A written constitution is, therefore, an important safeguard against abuses by the government of their powers, not least because it would entrench civil liberties and the due processes of law<sup>53</sup>." Nevertheless, one could argue codifying the constitution is not a proper safeguard against those trying to strive for political domination, a prime example is the abuse of power within ill-governed countries like Sri Lanka which have codified constitutions.

One could also rebut the argument on needing to codify the constitution to maintain checks and balances by reasoning that Constitutional conventions regulate Constitutional conduct and the behaviour of

<sup>42</sup> European Union (Future Relationship) Act 2020

<sup>43</sup> McHarg, A. "Reforming the United Kingdom Constitution: Law". *Convention, Soft Law. The Modern Law Review* (2008). 71/6: 853-877; Oliver, D. "Written Constitutions: Principles and Problems". *Parliamentary Affairs* (1992) 42/2: 135-152.

<sup>44</sup> AC Grayling, 'Why the UK Needs a Written Constitution' in DJ Galligan (ed), *Constitution in Crisis: The New Putney Debates* (IB Tauris 2017).

<sup>45</sup> Blick A and Hennessy P, 'Brexit and the Melting of the British Constitution' (The Constitution Society 2019).

<sup>46</sup> Beatson, J. *Reforming an unwritten Constitution*. *Law Quarterly Review* (2010). 48: 1-17.

<sup>47</sup> Gavin B, "Why the UK Needs a Written Constitution" (2017) < <https://citizen-network.org/library/why-uk-needs-a-written-constitution.html> > [accessed date 04/10/2022]

<sup>48</sup> Proportional Representation ([www.electoral-reform.org.uk](http://www.electoral-reform.org.uk)) < <https://www.electoral-reform.org.uk/voting-systems/what-are-voting-systems/proportional-representation/> > [accessed 09/01/2022]

<sup>49</sup> Dicey, A. V. "The Law of the Constitution", London: Macmillan and Co Ltd (1959)..

<sup>50</sup> Gavin B, "Why the UK Needs a Written Constitution" (2017) < <https://citizen-network.org/library/why-uk-needs-a-written-constitution.html> > [accessed date 04/10/2022]

<sup>51</sup> Beatson, J. "Reforming an unwritten Constitution". *Law Quarterly Review* (2010). 48: 1-17.

<sup>52</sup> Murkens, J. E. K. "The Great 'Repeal' Act will leave Parliament sidelined and disempowered." *LSE Brexit* (2016).

<sup>53</sup> 'Why The UK Needs A Written Constitution' (www.politics.co.uk, 2018) < <https://www.politics.co.uk/blog/2017/10/16/why-the-uk-needs-a-written-constitution/> > [accessed 09/01/2022]

public officers, thus acting as one of the checks and balances for the power of the executives.<sup>54</sup> The public is quite sensitive to the breach of Constitutional conventions and is likely to not tolerate it at any cost<sup>55</sup>. This nontolerant nature of the public was displayed during the rejection of the House of Lords to pass the budget in 1909. There were heavy political consequences as a result of the House of Lords refused to pass the Finance Bill in 1909 as it breached a convention<sup>56</sup>, causing a constitutional crisis between the years of 1909–11<sup>57</sup>, resulting in the Parliament Act of 1911 finally incorporating the convention into primary legislation. “Parliament may pass many laws, which many people do not want, but it never passes any laws, which any substantial section of the population violently dislikes<sup>58</sup>.” Even though conventions are not legally binding, in practice they seem to be more efficient than the courts, as the public opinion would probably result in severe political repercussions and the executive would likely face political difficulties.

The shortcomings of the UK’s unwritten common law constitution were further highlighted in the Supreme Court’s 2017 *Miller* case. In this case, it was argued that an Act of Parliament would be necessary before the Government could invoke Article 50 of the Treaty on the European Union and give the notice to leave the EU. The supreme court explained that “implementation of a referendum result requires a change in the law of the land, and the statute has not provided for that change, the change in the law must be made in the only way in which the UK constitution permits, namely through Parliamentary legislation<sup>59</sup>,” further explaining that the Government had no power to invoke

article 50 of the Treaty on European Union under the power of the Crown's prerogative because it would remove a series of rights created by Acts of Parliament, which can only be taken away by the parliament due to the concept of parliamentary sovereignty.

If the UK were to codify the constitution it requires a change in its current legal and political culture<sup>60</sup>, as it would threaten the fundamental principle of Parliamentary Supremacy as the constitution would replace Acts of Parliament as the highest source of law. The notion of Parliamentary Supremacy allows Acts of Parliament to contradict international law and repeal constitutional statutes, the Supreme Court has the power to subject such Acts to judicial review, however, they do not have the power to strike Acts of Parliament unless it ever was absolute<sup>61</sup>. If a written constitution is adopted, it would be incompatible with the concept of absolute legislative authority. Some academics such as Martin Loughlin and Stephen Tierney call the principle of Parliamentary Supremacy an inadequate and primitive concept and state that it must be “jettisoned<sup>62</sup>.”

Moreover, codifying the Constitution would make it more stable, however, it will be deprived of its most noteworthy character: its unrivalled flexibility and its political nature<sup>63</sup>. This would rob the Constitution of its adaptability, making it difficult and complicated<sup>64</sup> to keep up with the constantly changing political views of Britain<sup>65</sup>. One could contend that the real issue is the lack of certainty about the amendment formula of the written constitution and how the law is going to translate to the future as it is amended as previously seen in the 1982 Canadian

<sup>54</sup> Bradley, A. W. and Ewing, K. D. “Constitutional and Administrative Law”. Essex: Pearson. (2011). (ed.)

<sup>55</sup> Brunclik M. "Three-Fold Gap: Researching Constitutional Conventions in the Czech Republic: A Review Article." (Politologicky Casopis, (2021) 28(1); Chand, B.. “Conventions of the Constitution”. Journal of Comparative Legislation and International Law (1938) 20/4: 222-229.

<sup>56</sup> Leyland, P. “The Constitution of the United Kingdom”. Portland: Hart Publishing. (2012). (ed.)

<sup>57</sup> Powell, D. “The Constitutional Crisis, 1909–1,” (In The Edwardian Crisis, Palgrave, London, 1996) pp. 39-67

<sup>58</sup> Ewing, K.D. “The Law and the Constitution: Manifesto of the Progressive Party”. The Modern Law Review (2004). 67/5: 734-752.

<sup>59</sup> R (on the application of Miller) v Secretary of State for Exiting the European Union [2017] UKSC 5; also see [121] of the judgment

<sup>60</sup> Sotirios A Barber, “Constitutional Failure” (University Press of Kansas 2014) xvii

<sup>61</sup> R (Jackson) v Attorney General [2005] UKHL 56, [2005] 1 AC 262 [104]; [107] (Lord Hope), [102] (Lord Steyn), [159] (Lady Hale); Axa General Insurance Ltd and Others v The Lord Advocate [2011] UKSC 46, [2012] AC 868.

<sup>62</sup> Martin Loughlin and Stephen Tierney, ‘The Shibboleth of Sovereignty’ (2018) 81 MLR 986, 1015–16.

<sup>63</sup> Beatson, J. Reforming an unwritten constitution. Law Quarterly Review (2010) 48: 1-17.

<sup>64</sup> Allen, M. and Thompson, B. “Cases and Materials on Constitutional and Administrative Law”. Oxford: Oxford University Press.

<sup>65</sup> Bogdanor, V, Khaitan, T, and Vogenauer, S. (2007). “Should Britain Have a Written Constitution?” The Political Quarterly (2011) (ed.) 78/4: 499-517.



Constitution<sup>66</sup>. Nevertheless, it can be argued that the codified constitutions of countries like Sri Lanka have been subjected to many amendments over the years displaying that a codified constitution is not rigid and is quite adaptable to modification.

Nonetheless, it is debatable that it is easier to amend the uncoded constitution than in countries with written constitutions with elaborate amendment procedures. Some scholars argue that codifying the constitution would make it conservative<sup>67</sup> and anti-rationalist<sup>68</sup>. This flexibility can also be seen as a benefit as it has enabled the removal of hereditary peers from the House of Lords, the introduction of the Human Rights Act 1998, devolution to Scotland, Wales, and Northern Ireland, via the establishment of the Scottish Parliament and Welsh Assembly in 1999, the Northern Ireland Assembly in 1998. The creation of the Supreme Court and the Freedom of Information Act (2000) are also instances where this adaptable nature of the Constitution was highlighted. One could argue that this flexible and adaptable nature of the Uncoded Constitution promotes democracy as the frequent use of referendums and electoral reform increases political participation.

An argument often brought up in support of codifying the Constitution is that it would offer a clear-cut, straightforward and user-friendly arrangement of the fundamental laws and principles. However, academics like Blick have argued that it would be nearly impossible to determine the accurately detailed and precise content of the Constitution as there are many customs, historic documents, common law, and royal prerogatives that are currently a part of the UK Constitution<sup>69</sup>. Conversely, this fact

could also be perceived as a shortcoming of the Uncoded Constitution as some aspects of it is unclear and more open to interpretation by the Judiciary, causing uncertainty and lack of clarity. Most general citizens are unaware of the UK's governing arrangements and require political education and legal clarity. A survey conducted by YouGov in 2018 disclosed that 65% of respondents wanted "a written constitution providing clear legal rules within which government ministers and civil servants are forced to operate<sup>70</sup>." Likewise, a survey conducted by ComRes in 2019 revealed that 72% of the respondents were in support of having a written Constitution to provide clear legal rules for how Government Ministers, Parliament and civil servants are required to act<sup>71</sup>. Therefore, one could argue in favour of codification of the UK constitution by declaring that it would compile all of the rules into a set of documents, consequently making the laws easy to understand by clarifying laws<sup>72</sup>, protecting it with entrenchments and it is clearing up the confusion of what is included in the constitution. This would allow the authorities, institutions and the general public to comprehend and easily enforce them.

There have been several attempts to codify the Constitution such as Tony Benn's Constitution which was ordered by the House of Commons in 1991 and the IPPR Constitution<sup>73</sup>, nevertheless, all these attempts have failed. Many academics such as Roger Scruton<sup>74</sup> regard the notion of a codified constitution as "unnecessary, undesirable and un-British<sup>75</sup>." The constitutional reforms since 1997 (House of Lords Reform, Electoral Reform, Devolution & Regional Government, a Bill of Rights (Human Rights Act), a Freedom of

<sup>66</sup> The amendment process introduced during the 1982 constitutional reform is no longer approved of the Parliament of the United Kingdom.

<sup>67</sup> Edmund Burke, "Reflections on the Revolution in France" (first published 1790, Dent 1910).

<sup>68</sup> Michael Oakeshott, "Rationalism in Politics" (Methuen 1962).

<sup>69</sup> Blick, A. "Codifying-or not codifying- the UK Constitution: A literal Review". Centre for Political and Constitutional Studies, Kings College London. (2011). 4-32.

<sup>70</sup> YouGov / Unlock Democracy Survey Results | cloudfront.net < [https://d25d2506sfb94s.cloudfront.net/cumulus\\_uploads/document/suhgvnbdg3/UnlockDemocracy\\_181116\\_Constitution\\_w.pdf](https://d25d2506sfb94s.cloudfront.net/cumulus_uploads/document/suhgvnbdg3/UnlockDemocracy_181116_Constitution_w.pdf) > [accessed 09/01/2022]

<sup>71</sup> Daily Express Voting Intention and Brexit Poll January 2019 (comresglobal.com, 2019) <

<https://comresglobal.com/polls/daily-express-voting-intention-and-brexit-poll-january-2019/> > [accessed 09/01/2022]

<sup>72</sup> Robert Blackburn, 'Enacting a Written Constitution for the United Kingdom' (2015) 36 Stat LR 1

<sup>73</sup> INSTITUTE FOR PUBLIC POLICY RESEARCH < [https://www.ippr.org/files/images/media/files/publication/2014/01/the-Constitution-of-the-united-kingdom\\_1991-2014\\_1420.pdf](https://www.ippr.org/files/images/media/files/publication/2014/01/the-Constitution-of-the-united-kingdom_1991-2014_1420.pdf) > [accessed date 03/30/2022]

<sup>74</sup> Roger Scruton, A Political Philosophy (Continuum 2006) vii–viii.

<sup>75</sup> "The House of Commons Political and Constitutional Reform Committee, A New Magna Carta?" (www.parliament.uk 2014) < <https://publications.parliament.uk/pa/cm201415/cmselect/cmpolcon/463/46302.htm> > [accessed 08/31/2022]

Information Act, more use of referendums, and a Constitutional Reform Act) display an absence of confidence in the traditional constitution nevertheless, it also illustrated the lack of political will for a new constitution<sup>76</sup>. Even so, over the year many scholars have also argued for the codification of the constitution and have produced several draft constitutions<sup>77</sup>.

Some of the prominent draft constitutions to date are the Macdonald Constitution, published with the Liberal Democrats' federal green paper, the Tony Benn's Constitution, ordered by the House of Commons in 1991 and the IPPR constitution. Most of these draft constitutions maintain the doctrine of parliamentary supremacy and the political system and focus on presenting a less confusing and more comprehensible take on the structures of government and fundamental rights, diminishing the concerns of scholars who contend that codifying the constitution would be a threat to parliamentary supremacy and cause a shift in the current political framework of UK. The HCPCRC draft constitution clarifies that the Parliament holds exclusive powers to legislate "without limitation" on all matters, including the Constitution<sup>78</sup>. The Oxford student draft constitution also reflects a similar view<sup>79</sup>. The main elements of the current UK Constitution are left more or less intact<sup>80</sup>. However, LSE's draft constitution<sup>81</sup> and HCPCRC's draft constitution grant courts the power of constitutional review in situations Acts of Parliament and the constitution contradict each other and empower the courts to make a declaration of non-compliance and unconstitutionality<sup>82</sup>.

## CONCLUSION

Contrary to popular beliefs majority of the Britain's Constitution has already been transcribed on paper in statutory form and most of the other uncoded sets of rules and traditions have been incorporated into the Cabinet Manual. The fragments of the British Constitution that continued to stay uncoded are areas of the Constitutional order which are regulated by firmly established conventions. For example, the powers and the relationship between the executive and the legislature are governed by conventions.

It can also be disputed that codifying the British Constitution would strip it, of its most noteworthy quality: its flexible nature which enables it to be reformed to reflect the circumstances at a given time, robbing it of its adaptable nature. Academics have stated purpose of codification is to conserve constitutional choices that already exist<sup>83</sup>. However, codifying the constitution may force the UK to reach conclusions on issues, that otherwise need not be answered yet, such as whether the UK should become a monarchy or a republic and whether the UK should become a federal state or a unitary state. These issues do not need to be answered right now as the uncoded Constitution shows a resemblance to all of these structures due to its vague nature and broad interpretations.

Moreover, the argument about improving the stability, accountability, clarity, and balance of the Constitution through codification might not be viable as the entire Constitutional framework of the UK would shift, leading to greater legal and political problems. However, the draft constitutions displayed the aim to preserve the current political system and the

<sup>76</sup> Vernon Bogdanor, *The New British Constitution* (Hart Publishing, 2009) ix.

<sup>77</sup> Jeremy Bentham, "Constitutional Code", vol I (F Rosen and JH Burns ed, first published 1830, Clarendon Press 1983); Lord Hailsham, 'Elective Dictatorship', Richard Dimbleby Lecture (BBC 1976); Lord Hailsham, 'The Dilemma of Democracy: Diagnosis and Prescription' (Collins 1978); Ferdinand Mount, 'The British Constitution Now: Recovery or Decline?' (Heinemann 1992) 3; Tony Benn and Andrew Hood, 'Common Sense: New Constitution for Britain' (Hutchinson 1993); IPPR, 'A Written Constitution for the United Kingdom' (Mansell 1991);

<sup>78</sup> THE UK CONSTITUTION - UK Parliament ([www.parliament.uk](http://www.parliament.uk)) < <https://www.parliament.uk/globalassets/documents/commons-committees/political-and-constitutional-reform/The-UK-Constitution.pdf> > [accessed 08/31/2022]

<sup>79</sup> Vernon Bogdanor, Tarunabh Khaitan and Stefan Vogenauer, 'Should Britain Have A Written Constitution?' *Political Quarterly* (2007) 499.

<sup>80</sup> IPPR, *A Written Constitution for the United Kingdom* (Mansell 1991).

<sup>81</sup> Conor G "The Constitution" < <https://lsedesignunit.com/theconstitution/offline/download.pdf> > [accessed 08/31/2022]

<sup>82</sup> The House of Commons Political and Constitutional Reform Committee, *A New Magna Carta?* (HC 2014–15) 284

<sup>83</sup> Murkens, J.E.K., "A written constitution: a case not made." *Oxford Journal of Legal Studies*, (2021) 41(4), pp.965-986; Daniel Elazar, 'Constitution-Making: The Pre-eminently Political Act' in KG Banting and R Simeon (eds), *Redesigning the State: The Politics of Constitutional Change in Industrial Nations* (Macmillan 1985) 233.

doctrine of parliamentary supremacy, thus one could argue the key features of the uncodified Constitution are unaffected in theory. Then again, considering the practical realities, codifying the constitution would lead to a period of instability as it would likely be followed by a long time of debate and uncertainty about the constitution. Moreover, academics like Blick mentioned it would not be possible to determine the precise substance of the Constitution to codify it.

As previously discussed, the uncodified nature of the Constitution could be a result of the lack of a defining historical political event within Britain that otherwise would have compelled them to codify the constitution (such as the civil war – in South Africa, Independence – in Sri Lanka). In the absence of such a crisis, there is a lack of shared political will to build a codified constitution together, and this would be a real threat to the actual process of codification as it might lead to a period of dispute and debate.

Even though it can be argued that codifying the Constitution would improve stability, accountability, clarity, and balance, the Constitution would lose its adaptable and flexible nature in the process. Besides, the current uncodified Constitution has been successful and effective for aeons thus suddenly changing it would cause the whole system to shift causing practical problems. Thus, observing the issues discussed above, even though there are certain weaknesses in the current UK Constitution such as the exercise of prerogative power, further codification of the UK Constitution seems rather uncalled for, as of right now, unless there is a collective political will.

## REFERENCES

### Statutes and statutory instruments

- 1) Human Rights Act of 1998
- 2) Constitutional Reform Act of 2005
- 3) House of Lords Reform Acts 2014
- 4) House of Lords (Expulsion and Suspension) Act 2015
- 5) European Union (Withdrawal) Act 2018
- 6) European Union (Future Relationship) Act 2020

### Books and Journals

- 1) AC Grayling, 'Why the UK Needs a Written Constitution' in DJ Galligan (ed), *Constitution in Crisis: The New Putney Debates* (IB Tauris 2017).
- 2) Allen, M. and Thompson, B. "Cases and Materials on Constitutional and Administrative Law". Oxford: Oxford University Press.
- 3) Blick, A and Hennessy P, 'Brexit and the Melting of the British Constitution' (The Constitution Society 2019).
- 4) Barbwe N.W. "Law and Constitutional Conventions" (2009).
- 5) Beatson, J. "Reforming an unwritten Constitution". *Law Quarterly Review*, (2010). 48: 1-17.
- 6) Bevir, M. and Rhodes, R.A., "Searching for civil society: changing patterns of governance in Britain." (*Public Administration*, 2003) 81(1), pp.41-62.
- 7) Blick, A. Codifying-or not codifying- the UK constitution: A literal Review. Centre for Political and Constitutional Studies, Kings College London. (2011) 4-32.
- 8) Bogdanor, V, Khaitan, T, and Vogenauer, S. (2007). "Should Britain Have a Written Constitution?" *The Political Quarterly* (2011) (ed.) 78/4: 499-517.
- 9) Bradley, A. W. and Ewing, K. D. "Constitutional and Administrative Law". Essex: Pearson. (2011). (ed.)
- 10) Brunclík M. "Three-Fold Gap: Researching Constitutional Conventions in the Czech Republic: A Review Article." (*Politologicky Casopis*, (2021) 28(1);
- 11) Chand, B. "Conventions of the Constitution". *Journal of Comparative Legislation and International Law* (1938) 20/4: 222-229.
- 12) Daniel Elazar, 'Constitution-Making: The Pre-eminently Political Act' in KG Banting and R Simeon (eds), *Redesigning the State: The Politics of Constitutional Change in Industrial Nations* (Macmillan 1985) 233.
- 13) Dicey, A. V. "The Law of the Constitution", London: Macmillan and Co Ltd (1959)..
- 14) Edmund Burke, "Reflections on the Revolution in France" (first published 1790, Dent 1910).



15) Ewing, K.D. "The Law and the Constitution: Manifesto of the Progressive Party". *The Modern Law Review* (2004). 67/5: 734-752.

16) IPPR, *A Written Constitution for the United Kingdom* (Mansell 1991).

17) Ipsos Mori. "Audit of Political Engagement 5: The 2008 Report with a special focus on the Constitution". London: Hansard Society. (2008).

18) Jennings, "The Law and the Constitution", (1959) 5th edn.

19) Leyland, P. "The Constitution of the United Kingdom". Portland: Hart Publishing. (2012). (ed.)

20) Martin Loughlin and Stephen Tierney, 'The Shibboleth of Sovereignty' (2018) 81 *MLR* 986, 1015–16.

21) McHarg, A. "Reforming the United Kingdom Constitution: Law". *Convention, Soft Law. The Modern Law Review* (2008). 71/6: 853-877;

22) Michael Oakeshott, "Rationalism in Politics" (Methuen 1962).

23) Murkens, J. E. K. "The Great 'Repeal' Act will leave Parliament sidelined and disempowered." *LSE Brexit* (2016).

24) Murkens, J.E.K., "A written constitution: a case not made." (*Oxford Journal of Legal Studies*, 2021) 41(4), pp.965-986

25) Oliver, D. "Written Constitutions: Principles and Problems". *Parliamentary Affairs* (1992) 42/2: 135-152.

26) Parpworth, N. "Constitutional and Administrative Law". Oxford: Oxford University Press. (2012). (ed.)

27) Powell, D. "The Constitutional Crisis, 1909–1," (In *The Edwardian Crisis*, Palgrave, London, 1996) pp. 39-67

28) Roger Scruton, *A Political Philosophy* (Continuum 2006) vii–viii.

29) Sotirios A Barber, "Constitutional Failure" (University Press of Kansas 2014) xvii

30) Vernon Bogdanor, *The New British Constitution* (Hart Publishing, 2009) ix.

## Websites

1) Conor G "The Constitution" < <https://lsedesignunit.com/theconstitution/offline/download.pdf> > [accessed 08/31/2022]

2) Gavin B, "Why the UK Needs a Written Constitution" (2017) < [https://citizen-network.org/library/why-](https://citizen-network.org/library/why-uk-needs-a-written-constitution.html)

[uk-needs-a-written-constitution.html](https://citizen-network.org/library/why-uk-needs-a-written-constitution.html) >[accessed date 04/10/2022]

3) Ghai, Yash, "Chimera of Constitutionalism: State, economy and society in Africa", lecture, 2010, < [https://www.up.ac.za/media/shared/Legacy/sitefiles/file/47/15338/chimera\\_of\\_Constitutionalism\\_yg1.pdf](https://www.up.ac.za/media/shared/Legacy/sitefiles/file/47/15338/chimera_of_Constitutionalism_yg1.pdf) > [accessed date 04/10/2022]

4) House of Lords, "Select Committee on Constitution First Report", (July 2001), < <https://publications.parliament.uk/pa/ld200102/ldselect/ldconst/11/1106.htm> > [accessed date 03/29/2022]

5) INSTITUTE FOR PUBLIC POLICY RESEARCH < [https://www.ippr.org/files/images/media/files/publication/2014/01/the-Constitution-of-the-united-kingdom\\_1991-2014\\_1420.pdf](https://www.ippr.org/files/images/media/files/publication/2014/01/the-Constitution-of-the-united-kingdom_1991-2014_1420.pdf) > [accessed date 03/30/2022]

6) INSTITUTE FOR PUBLIC POLICY RESEARCH < [https://www.ippr.org/files/images/media/files/publication/2014/01/the-Constitution-of-the-united-kingdom\\_1991-2014\\_1420.pdf](https://www.ippr.org/files/images/media/files/publication/2014/01/the-Constitution-of-the-united-kingdom_1991-2014_1420.pdf) > [accessed date 03/30/2022]

7) The House of Commons Political and Constitutional Reform Committee, *A New Magna Carta?* (www.parliament.uk 2014) < <https://publications.parliament.uk/pa/cm201415/cmselect/cmpolcon/463/46302.htm> > [accessed 08/31/2022]

8) THE UK CONSTITUTION - UK Parliament (www.parliament.uk) < <https://www.parliament.uk/globalassets/documents/commons-committees/political-and-constitutional-reform/The-UK-Constitution.pdf> > [accessed 08/31/2022]

9) Why The UK Needs A Written Constitution' (www.politics.co.uk, 2018) < <https://www.politics.co.uk/blog/2017/10/16/why-the-uk-needs-a-written-constitution/> > [accessed 09/01/2022]

10) YouGov / Unlock Democracy Survey Results | cloudfront.net < [https://d25d2506sfb94s.cloudfront.net/cumulus\\_uploads/document/suhgvnbdg3/UnlockDemocracy\\_181116\\_Constitution\\_w.pdf](https://d25d2506sfb94s.cloudfront.net/cumulus_uploads/document/suhgvnbdg3/UnlockDemocracy_181116_Constitution_w.pdf) > [accessed 09/01/2022]

11) Proportional Representation  
([www.electoral-reform.org.uk](http://www.electoral-reform.org.uk)) <  
<https://www.electoral-reform.org.uk/voting-systems/what-are-voting-systems/proportional-representation/> > [accessed 09/01/2022]

12) Daily Express Voting Intention and  
Brexit Poll January 2019  
([comresglobal.com](http://comresglobal.com), 2019) <  
<https://comresglobal.com/polls/daily-express-voting-intention-and-brexit-poll-january-2019/> > [accessed 09/01/2022]



## Violation of Human Dignity through Online Harassment: A Case for Stronger Protection of Privacy in Sri Lanka

Kushanthi Harasgama<sup>1</sup>, Samurdhi Jayamaha<sup>\*1</sup>

<sup>1</sup> School of Law, Faculty of Humanities and Sciences, SLIIT, Malabe, Sri Lanka,

### ARTICLE INFO

#### Article History:

Received Date: 01 July 2022

Accepted Date: 15 September 2022

#### Keywords:

Human dignity, right to privacy, online harassment

#### Citation:

Kushanthi Harasgama, Samurdhi Jayamaha. (2022). *Violation of Human Dignity through Online Harassment: A Case for Stronger Protection of Privacy in Sri Lanka*. Proceedings of SLIIT International Conference on Advancements in Sciences and Humanities, (11) October, Colombo, 112 - 119.

### ABSTRACT

Human dignity, a concept widely discussed philosophical, political and legal spheres, has gained importance with its recognition under the Universal Declaration of Human Rights, as a foundation of human rights. Dignity is understood to be inherent in humans. Scholars observe dignity to be twofold; firstly, dignity by reason of humans having the capacity to rationalize and secondly humans as social animals having a sense of self-worth and social standing. Human Dignity, therefore, is universally recognized so as human rights in general. On the contrary, Privacy is just another right and does not command a wide and equal standing in every society. Privacy relates to the personal space; be it bodily, informational, territorial or communicational within which a person expects to be free from scrutiny. Privacy refers to the limit to which one desires to expose himself to others. It is understood that privacy is one element which contributes to the notion of dignity. Privacy violations will therefore lead to the degradation of human dignity. This is illustrated in cases of online harassment as publication of intimate, sexually explicit video/images of individuals, impersonating victims, and defaming or insulting victims in public categorically invade the privacy of individuals thus violating their human dignity. Sri Lanka has a piecemeal approach to protecting privacy, which is scattered around various statutes and case law, and is of limited scope. Upholding dignity, therefore, is challenged although the Sri Lankan

\*Samurdhi, samurdhi.j@slit.lk

Constitution and case law identify dignity as foundational. Hence, it is argued that a state which is concerned with upholding the dignity of its citizens should be equally concerned about protecting the privacy of those citizens.

## INTRODUCTION

Human dignity is a concept which is increasingly being used in philosophical, political and legal spheres to justify the value of human beings and why they should not be treated in certain ways. Although the concept of dignity has existed for a long time, it gained prominence with the adoption of the 1948 *Universal Declaration of Human Rights* with its preamble referring to the 'inherent dignity' of human beings as a ground for the recognition of human rights. Protection of privacy is one of the important legal safeguards required to ensure human dignity as well as the enjoyment of other human rights. In the Sri Lankan legal system too, human dignity appears to be a much-revered concept with the Preamble to the Constitution itself referring to the dignity of the people. However, privacy does not appear to receive much protection or importance in the Sri Lankan legal system.

In the last two decades or so, with the rapid increase in the use of information communication technologies (hereinafter ICTs) and the internet for daily activities of people, individual privacy has come under threat with many parties including state actors, social media operators, businesses and individuals collecting personal information of users, and using such information for various purposes including for malicious purposes. Thus, one often hears stories of governments collecting information about citizens for surveillance on the pretext of 'security', businesses collecting information about preferences of customers/social media users to carry out targeted marketing or to carry out political campaigns such as in the case of the Cambridge Analytica Data Scandal and malicious individuals collecting and using the information of others to commit cybercrimes. Among these different kinds of privacy invasions committed using digital technologies, online harassment

has gained prominence in recent times. In this context, this paper argues that if Sri Lanka is serious about protecting human dignity, the country should ensure stronger protection of individual privacy. This paper demonstrates how cases of online harassment amount to privacy violations which in turn can lead to the undermining of human dignity. Thereby it seeks to establish that protection of privacy is important for protecting human dignity.

The paper is organized as follows; the first part of the paper examines the definitions of the two concepts of human dignity and privacy while the relationship between those two concepts will be explored with reference to the case of online harassment in Part 2 of the paper. Thereafter, the final part of the paper provides an account of the existing legal framework in Sri Lanka with regards to privacy and dignity to understand to which extent the two concepts have been regarded in Sri Lanka.

### 1. Human Dignity and Privacy: Two Elusive Concepts

The concept of human dignity gained prominence in the legal parlance with the adoption of the *Universal Declaration of Human Rights* in 1948.<sup>84</sup> Since then it has consistently appeared in many international and national legal instruments as a justification for the rights and duties created through them.<sup>85</sup> Despite its popularity, human dignity has proved to be a notoriously elusive concept with different scholars and philosophers giving it different meanings. However, two of the dominant modern conceptions of human dignity found in the literature are; (i) dignity as the inherent worth of human beings as moral agents capable of rational thought, deliberation and free choice<sup>86</sup>; and (ii) dignity as a person's status as a member of society commanding respect.<sup>87</sup> According to the first conception of human dignity promoted by philosophers such as Kant, every individual possesses human dignity by virtue of being a human being that possesses the capacity of reasoning and rational thinking. Therefore, dignity is regarded as 'an absolute

<sup>84</sup> Preamble, Universal Declaration of Human Rights 1948. <sup>86</sup> Lebech M, 'What is Human Dignity' [2003] 2 Maynooth Philosophical Papers 1, 6

<sup>85</sup> Shultziner D, 'Human Dignity - Functions and Meanings' [2003] 3(1) Global Jurist Topics 10 <sup>87</sup> Lebech M, n(2) 6; Jeremy W, 'Dignity and Defamation: The Visibility of Hate' [2010] 123 Harv L Rev 1596, 1611-12

inner value all human beings possess.<sup>88</sup> On the second conception, human dignity refers to one's sense of self-worth and self-respect which are determined by the social norms relating to respect that we have internalized. Thus, it is argued that dignity refers to one's innate personhood, integrity and self-respect<sup>89</sup>, 'our sense of ourselves as commanding (attitudinal) respect' or 'one's status as a member of society in good standing. . . [which] demands for recognition and treatment that accord with that status.'<sup>90</sup> Dignity in this sense is a socially grounded concept according to which what it means to be human and to lead a dignified life is dependent on social structures of one's culture and sub-culture.<sup>91</sup>

Like human dignity, privacy too is an elusive concept that has defied many an attempt to define it clearly. It has been given so many different meanings in the existing literature leading some scholars to conclude that '[p]rivacy. . . is a concept in disarray. Nobody can articulate what it means.'<sup>92</sup> Others see it as 'chameleon-like word' used to refer to a 'wide range of wildly disparate interests.'<sup>93</sup> The different conceptions of privacy in the existing literature range from narrow to broad with the narrowest conceptions focusing on privacy as access to/disclosure of private information while the broadest conceptions see it as relating to individual autonomy encompassing control over one's body, freedom from governmental interference in one's private affairs etc. For instance, Andrei Marmor, advocating a narrow conception of privacy, argues that the right to privacy refers to having 'a reasonable measure of control over the ways' in which one can present him/herself to others.<sup>94</sup> Ruth Gavison, on the contrary, views privacy in a broader sense as relating to 'our concern over our accessibility to others: the extent to which we are known to others, the extent to which others have physical access to

us, and the extent to which we are the subject of others' attention.'<sup>95</sup> Based on these various definitions, some scholars have argued that privacy includes the following facets:<sup>96</sup> Information privacy (involving rules about collection and handling of personal data i.e. credit information, medical records etc); Bodily privacy (concerned with the protection of the physical self of persons); Privacy of communications (related to security and privacy of mail, telephones, email and other forms of communication) and Territorial privacy (concerned with the setting up of limits on intrusion into domestic environment etc). For the purposes of this paper, we adopt the conception of privacy proposed by Ruth Gavison as 'our concern over our accessibility to others' as it broadly corresponds to the modern intuitions about privacy and assume it to include the four facets mentioned above.

Having broadly identified the meaning of the two concepts of human dignity and privacy, in the following part of the paper we turn to explore the relationship between human dignity and privacy taking online harassment as a case in point.

## 2. Protecting Dignity through Privacy: the case of Online Harassment

Right to privacy is often justified with reference to its importance for human dignity.<sup>97</sup> It can be argued that privacy is important for ensuring human dignity understood in both of the above discussed senses. As discussed, the first conception of dignity holds that human beings are entitled to respect as they all possess human dignity by virtue of their capacity for rational thinking and reasoning. As some privacy scholars have argued, privacy allows individuals to have an autonomous space, control over their body and the information

<sup>88</sup> Miszta B A, 'The Idea of Dignity: Its Modern Significance' [2012] 61(1) European Journal of Social Theory 101,102

<sup>89</sup> Cheung A, 'Revisiting Privacy and Dignity: Online Shaming in the Global E-Village' [2014] 3 Laws 301 <<https://www.mdpi.com/2075-471X/3/2/301/pdf>> accessed March 7, 2022

<sup>90</sup> Jeremy W, n (4) 1611-12.

<sup>91</sup> Shultziner D, n(1) 10

<sup>92</sup> Solove D J, *Understanding Privacy* (Harvard University Press, 2010)

<sup>93</sup> ibid

<sup>94</sup> Having a reasonable measure of control over how one presents oneself to others is an aspect of individual autonomy. However, autonomy is a broader concept encompassing one's control over all aspects of one's life. Marmor A, 'What is the right to Privacy' [2015] 43(1) Philosophy & Public Affairs 3, 4

<sup>95</sup> Gavison R, 'Privacy and the Limits of Law' [1980] 89(3) The Yale Law Journal 421

<sup>96</sup> Henkin L, *The International Bill of Rights : The Covenant on Civil and Political Rights* (Columbia University Press, 1981)

<sup>97</sup> Post R C, 'Three Concepts of Privacy' [2001] 89 George Town Law Journal 2087, 2094

disseminated about them.<sup>98</sup> It gives people an opportunity to experiment, make mistakes and engage in certain activities without being subject to scrutiny and criticism,<sup>99</sup> and thus, give them the space they need to develop themselves.<sup>100</sup> Furthermore, privacy also allows us to determine to a certain extent the 'constitution of our social environment' by enabling us to choose 'the amount and the kind of personal distance [we] maintain with others' without which we may feel oppressed.<sup>101</sup> In these various ways, privacy ensures that individuals have the opportunity to exercise their reasoning capacities from which they derive their human dignity. Privacy is also important dignity in the second sense discussed above, one's sense of self-worth and self-respect which are determined by the social norms relating to respect that we have internalized. Invasions of privacy defy the societal norms that determine the respect and standing of a person in society, and thus, undermine their sense of self-respect or dignity.<sup>102</sup>

Now we turn to explore the relationship between dignity and privacy with reference to the case of online harassment. It is often argued that the right to privacy has come under severe threats with the increase in the use and popularity of the internet and information communication technologies. Online harassment can be identified as one of the main ways in which privacy violations occur in the cyberspace. It generally refers to a broad range of abusive conduct committed via information communication technologies with the intent of harming, harassing and humiliating victims.<sup>103</sup> Online harassment takes many forms and includes both sexual and non-sexual forms of harassment such as the publication of sexually explicit images/videos of victims without consent on porn sites/social media (commonly known as revenge porn), extorting victims and obtaining sexual favours/money etc (sextortion), cyberstalking, cyberbullying etc.<sup>104</sup>

As discussed below, most forms of online harassment involve severe violations of privacy thus leading to violations of human dignity.

As noted above, publications of intimate and often sexually explicit video/images of individuals or revenge pornography are often used by perpetrators to commit online harassment. Publication and distribution of such content can constitute a violation of all aspects of a victim's privacy such as their bodily privacy, privacy of their communications, information privacy, and territorial privacy. Scholars argue that the victims of revenge pornography often experience 'desecration of their body' thus indicating how revenge porn can violate the bodily privacy by exposing the victim's body to the public eye.<sup>105</sup> Furthermore, often, the nude or sexually explicit images of victims published by perpetrators are images which have been shared with the perpetrator by the victim him/herself during a romantic relationship. Thus, publishing the contents of a communication which was meant only for the eyes of the receiver is a violation of the privacy of communications. Furthermore, by publishing private images/videos of a person without their consent, the perpetrator violates privacy of the victim's information (information relating to their body, their sexual activities etc). In some revenge pornography cases, perpetrators obtain the relevant images/videos by placing secret cameras in the victim's room or places where a person expects an amount of privacy such as washrooms. In such cases, the perpetrators violate a victim's territorial/spatial privacy as well.

Exposing a very intimate and private aspect of an individual such as their nudity and their sexual engagements to the public eye violates the social norms relating to privacy through which an individual's sense of self-respect and self-worth are constructed, and thus constitute an attack upon one's dignity. It 'humiliates the victim sexually and degrades' him or her.<sup>106</sup>

<sup>98</sup> Rosenberg R, Dancig-Rosenberg H, through 'electronic form' or digital/soft copy form which is not necessarily communicated through 'online' but through digital (soft-copy) form as opposed to hard-copy form. 'Reconceptualising Revenge Porn' [2021] 63 Arizona Law review 199

<sup>99</sup> Marmor A, n(11) 8

<sup>100</sup> Rosenberg R, Dancig-Rosenberg H, n(15) 219

<sup>101</sup> Marmor A, n(11)

<sup>102</sup> Post R C, n(14) 2094

<sup>103</sup> For the purpose of this paper scope of 'online' in the phrase 'online harassment'; is used to mean those instances where the internet or similar mediums are used to communicate information. It is not used to include harassment directed to degradation of human dignity.

<sup>104</sup> The authors acknowledge that some of the acts referred to as 'harassment' go beyond 'harassment' in its popular sense and that they amount to criminal offences. However, the purpose of this paper is limited to exploring the relationship between online harassment and privacy violations which leads to degradation of human dignity.

<sup>105</sup> Rosenberg R, Dancig-Rosenberg H, n(15) 219, 220

<sup>106</sup> *ibid*

Scholars also argued that revenge porn reduces a victim's identity to his or her sexuality and impales other aspects of their identity such as their intellectual and creative abilities etc.<sup>107</sup> In these various ways revenge pornography violates an individual's dignity through violation of privacy.

Similarly, other forms of online harassment also often involve serious violations of privacy. For instance, another form of online harassment is sextortion which refers to the practice of extorting sexually explicit images, sexual favours, money or other favours from victims using various threats such as threats of publishing private images of victims, private information about victims, harming victims or others close to the victim etc. In the case of sextortion, by demanding sexual favours or sexually explicit images of the victim, the perpetrator shows a complete disregard for the victim's bodily privacy and privacy of their information, and thus fail to show any respect to the victim as a rational human being of inherent worth. Cyber-bullying, another common form of online harassment, involves repeatedly engaging in aggressive online behaviour with the objective of frightening and undermining someone's self-esteem or reputation. In order to bully their victims, cyberbullies often employ tactics such as creating fake accounts and impersonating victims, defaming or insulting victims in public chat rooms/social media, publishing private or embarrassing information about victims in online forum etc. It is obvious that these bullying tactics such as publishing private information, defamation etc involve serious violations of privacy.

It is evident from the above discussion that many forms of online harassment undermine protection of privacy which is often essential for ensuring respect for human dignity of persons. Having understood that, in the next section, we

examine the status of dignity and privacy protection in Sri Lanka.

### 3. Protection of Dignity and Privacy in Sri Lanka

Human dignity appears to be a revered concept in Sri Lankan legal system too with the Preamble to the Constitution itself referring to the dignity of the people.<sup>108</sup> The fundamental rights chapter of the Constitution, which gives recognitions to human rights such as the freedom from torture, inhuman, cruel and degrading treatment, the right to equality and the freedom of speech and expression, freedom of religion etc, in particular, can be regarded as aimed at ensuring human dignity. Furthermore, in *Ajith C.S. Perera v Daya Gamage and Others*<sup>109</sup> the Supreme Court recognized that the 'concept of human dignity, which is the entitlement of every human being, is at the core of the fundamental rights enshrined in our Constitution. It is a fountainhead from which these fundamental rights spring forth and array themselves in the Constitution, for the protection of all the people of the country.'<sup>110</sup> Furthermore, in the case of *Sinha Ratnatunga v The State*<sup>111</sup> the Supreme court observed that "to invade [an individual's] privacy is to assail his integrity as a human being and thereby deny him his right to remain in society as a human being with human dignity."<sup>112</sup> Furthermore, dignity has been recognized as a legally protected value under Sri Lankan law for a long time under the Roman-Dutch Law doctrine of *action iniuriarum*<sup>113</sup> which provides a cause of action against defamatory statements and damages to reputation as injury to one's dignity. Furthermore, *action iniuriarum*<sup>114</sup> is a long entrenched Roman-Dutch Law action in Sri Lanka available against defamatory statements which provide for damages to reputation as injury to one's dignity. Thus, it is evident that

<sup>107</sup> *ibid*; McGlynn C, Rackley E, 'Image-Based Sexual Abuse' [2017] 37 Oxford Journal of Legal Studies 534 212-13.

<sup>108</sup> Preamble, The Constitution of the Democratic Socialist Republic of Sri Lanka

<sup>109</sup> *Ajith C.S. Perera v Daya Gamage and Others* SC FR553; Centre for Policy Alternatives, *Right to Privacy in Sri Lanka: Discussion Paper* (September 2020), 28

<sup>110</sup> Prasanna Jayawardena J, *Ajith C.S. Perera v Daya Gamage and Others* SC FR Application No. 273/2018 at page 23

<sup>111</sup> *Sinha Ratnatunga v The State* [2001] 2 Sri L.R. 172.

<sup>112</sup> Marsoof A, 'The Right to Privacy in the Information Era: A South Asian Perspective' [2008] 5(3) SCRIPTED 553; Centre for Policy Alternatives, *Right to Privacy in Sri Lanka: Discussion Paper* (September 2020), 28

the concept of human dignity is a much-revered concept in Sri Lankan law.

However, privacy which was discussed earlier as being essential for ensuring human dignity, has not received much recognition in Sri Lankan law. The Sri Lankan Constitution does not explicitly recognize a right to privacy, and at best recognizes the right to privacy in a piecemeal manner in various statutes, and cases. For instance Article 14A(2) which was inserted to the Sri Lankan Constitution<sup>115</sup> through section 2 of the 19<sup>th</sup> Amendment to the Constitution in 2015 mentions privacy as a ground for restricting the right of access to information guaranteed under Article 14A(1). Privacy is also implicitly and explicitly recognized in some other Sri Lankan statutes such as the *Post Office Ordinance No. 11 of 1908 (as amended)*, *Computer Crime Act No. 27 of 2007*, *Right to Information Act No. 12 of 2016*, *Banking Act No. 30 of 1988*, *Telecommunications Act No. 25 of 1991* and *Intellectual Property Act No. 36 of 2003*. For instance, the *Computer Crime Act*<sup>116</sup> prohibits unauthorised access to a computer, the illegal interception of data, unauthorised disclosure of information etc<sup>117</sup>; The *Telecommunications Act* prohibits willful interception and disclosure of contents of telecommunication messages and transmissions<sup>118</sup>; The *Right to Information Act*<sup>119</sup> provides that access to information may be denied where the information relates to personal information which 'would cause unwarranted invasion of the privacy of the individual.' The recently enacted *Personal Data Protection Act*<sup>120</sup> which is also significant in terms of privacy protection deals with the processing of personal information by individuals, public authorities, corporations, non-governmental organizations etc.

Sri Lankan Courts have also recognized privacy in limited circumstances.<sup>121</sup> For instance, in *Chinnappa et al. v Kanakar et al*<sup>122</sup> the court, upholding a custom in the Jaffna

peninsula, where adjoining landowners were permitted to enter the neighbour's land to cover the fence with ola leaves, noted the necessity of the custom to secure household privacy. *Abraham v Hume*<sup>123</sup> recognized that the owner of an estate or a superintendent had no right to enter the labourer's lines and invade his privacy. In *A.M.K. Azeez v W.T Senevirathne (SI Police)*<sup>124</sup> the Supreme Court reduced the sentence given to a couple convicted of insulting a police officer who entered their house to conduct a search, taking into consideration the circumstance in which the search was conducted - after midnight and where the privacy and sleep of the Appellants was disturbed. In the more recent *Sinha Ratnatunga v The State*<sup>125</sup> case, Yapa J., *inter alia*, observed that "[t]he press should not think they are free to invade the privacy of individuals in the exercise of their constitutional right to freedom of speech and expression, merely because the right to privacy is not declared a fundamental right of the individual..."<sup>126</sup> and also noted the importance of protecting privacy for ensuring human dignity.<sup>127</sup>

Despite these explicit and implicit references to privacy in the Sri Lankan constitution and statutes, none of them provide a definition of privacy and what it entails. Similarly, despite the recognition of the right to privacy in the above-mentioned cases, the court does not provide a proper definition of the right and its scope in any of them. However, it is observable that these different Acts in conjunction recognize and protect different aspects of privacy to a certain extent. For instance, the *Post Office Ordinance*, the *Computer Crime Act* and the *Telecommunications Act* protect, to a certain degree, the privacy of communications. The above mentioned Article 14A(1), the relevant provisions of the *Right to Information Act*, and the *Banking Act* protect privacy of personal information which protection has been significantly strengthened by the *Personal Data Protection Act*. Similarly, it can be argued

<sup>115</sup> The Constitution of the Democratic Socialist Republic of Sri Lanka, Article 14A

<sup>116</sup> Computer Crimes Act No. 27 of 2007

<sup>117</sup> Computer Crimes Act No. 27 of 2007, Ss 3, 8, 10

<sup>118</sup> Telecommunications Act No. 25 of 1991, ss 53, 54

<sup>119</sup> Right to Information Act No. 12 of 2016

<sup>120</sup> Personal Data Protection Act No.9 of 2022

<sup>121</sup> Centre for Policy Alternatives, n(30) 13

<sup>122</sup> *Chinnappa et al. v Kanakar et al* 13 NLR 157, 158, 159 and 160

<sup>123</sup> *Abraham v Hume* 52 NLR 449, 453

<sup>124</sup> *A.M.K. Azeez v W.T Senevirathne (SI Police)* 69 NLR 209, 210

<sup>125</sup> *Sinha Ratnatunga v The State* [2001] 2 Sri L.R. 172

<sup>126</sup> *Sinha Ratnatunga v The State* [2001] 2 Sri L.R. 172, 212-213

<sup>127</sup> *ibid*



that while in the *Chinnappa, Abraham and Azeez* cases the court recognized the concept of spatial/territorial privacy, in *Sinha Ratnatunga* it recognizes both spatial privacy (in that case, to be free from the prying eyes of the Press when engaging in one's personal affairs) and information privacy (i.e. not have information relating to one's personal/private matters disclosed publicly).

The above discussion evidences that although human dignity is a revered concept in the Sri Lankan law, privacy is not given adequate recognition. However, as was demonstrated in the foregoing section of the paper, protection of privacy is extremely important for protecting human dignity. Thus, if Sri Lanka is serious about protecting human dignity of its citizens, the country should take privacy protection seriously.

## CONCLUSION

The aim of this paper was to demonstrate the importance of having stronger protection of privacy in order to ensure protection of human dignity.

Dignity as enshrined in many legal texts and as identified by many scholars is inherent in humans and is a source to many human rights globally recognized. Scholars identify dignity as two-fold; one being the dignity which is inherent for being born as human with the ability to rationalize and deliberate and the other being one's social standing with the sense of self-worth and self-respect as determined by social norms. On the other hand, privacy allows individuals to have an autonomous space and control over their body and the information disseminated about them, leaving them a space within which they would and should not be scrutinized or critiqued without their consent. Categorically, invasion of privacy will amount to unsolicited critiquing of matters of personal nature, thus degrading that person in the eyes of the public, essentially affecting their dignity. This was exemplified in the foregoing discussion that dignity, in many circumstances is dependent upon the upholding of privacy of that person.

With the heavy reliance on ICT regularly, online harassment has become a growing menace, proving to be an illustrative case for

the underlying argument of this paper. It is observable that many forms of online harassment amount to violations of privacy as characterized by the publication of intimate and often sexually explicit videos/images of individuals, revenge pornography, impersonating victims, and defaming or insulting victims in public. Some of these explicitly encroach into the bodily privacy, privacy of communications, and information privacy of persons. In the case of revenge pornography, where perpetrators obtain the relevant images/videos by placing secret cameras in the victim's room or washrooms, it amounts to a violation of and territorial/spatial privacy too. These violations of privacy in the form of online harassment showcase a failure to respect victims as rational human beings of inherent worth, indispensably resulting in the degradation of human dignity.

In the case of Sri Lanka, dignity has gained recognition in the Constitution and case law. However, privacy although essential for ensuring human dignity, has not received much recognition in Sri Lankan law. The Sri Lankan Constitution does not explicitly recognize a right to privacy as an affirmative fundamental right; the right to privacy is only found in various statutes, and cases in limited sense. The foregoing analysis demonstrates how explicit recognition of a right to privacy is significant in effectively fighting against new menaces such as online harassment. Failure to recognize a right to privacy therefore will negatively affect the upholding of human dignity, as privacy is one essential ingredient feeding into the dignity of a person. Thus, if Sri Lanka aspires to meaningfully protect human dignity of its citizens, it should take privacy protection more seriously.

## ACKNOWLEDGEMENTS

This work was supported by the Accelerating Higher Education Expansion and Development (AHEAD) Operation of the Ministry of Higher Education (Sri Lanka) funded by the World Bank.

## REFERENCES

Primary Source  
Universal Declaration of Human Rights 1948.

The Constitution of the Democratic Socialist Republic of Sri Lanka 1978 as amended  
Post Office Ordinance No. 11 of 1908 (as amended),

Computer Crime Act No. 27 of 2007,  
Right to Information Act No. 12 of 2016,  
Banking Act No. 30 of 1988,  
Telecommunications Act No. 25 of 1991  
Intellectual Property Act No. 36 of 2003.  
Telecommunications Act No. 25 of 1991  
Personal Data Protection Act No.9 of 2022

Ajith C.S. Perera v Daya Gamage and Others  
SC FR Application No. 273/2018

Sinha Ratnatunga v The State [2001] 2 Sri L.R. 172.

Chinnappa et al. v Kanakar et al 13 NLR 157

Abraham v Hume 52 NLR 449

A.M.K. Azeez v W.T Senevirathne (SI Police)  
69 NLR 209

#### Secondary Sources

Centre for Policy Alternatives, *Right to Privacy in Sri Lanka: Discussion Paper* (September 2020)

Cheung A, 'Revisiting Privacy and Dignity: Online Shaming in the Global E-Village' [2014] 3 Laws 301 <<https://www.mdpi.com/2075-471X/3/2/301/pdf>> accessed March 7, 2022.

Gavison R, 'Privacy and the Limits of Law' [1980] 89(3) The Yale Law Journal 421

Henkin L, *The International Bill of Rights : The Covenant on Civil and Political Rights* (Columbia University Press, 1981)

Jeremy W, 'Dignity and Defamation: The Visibility of Hate' [2010] 123 Harv L Rev 1596

Lebech M, 'What is Human Dignity' [2003] 2 Maynooth Philosophical Papers 1

Marmor A, 'What is the right to Privacy'[2015] 43(1) Philosophy & Public Affairs 3

Marsoof A, 'The Right to Privacy in the Information Era: A South Asian Perspective' [2008] 5(3) SCRIPTed 553

McGlynn C, Rackley E, 'Image-Based Sexual Abuse' [2017] 37 Oxford Journal of Legal Studies 534

Miszta B A, 'The Idea of Dignity: Its Modern Significance' [2012] 61(1) European Journal of Social Theory 101

Post R C, 'Three Concepts of Privacy' [2001] 89 George Town Law Journal 2087

Rosenberg R, Dancig-Rosenberg H, 'Reconceptualising Revenge Porn' [2021] 63 Arizona Law review 199

Shultziner D, 'Human Dignity - Functions and Meanings' [2003] 3(1) Global Jurist Topics 10

Solove D J, *Understanding Privacy* (Harvard University Press, 2010)



**2022  
SICASH**  
SLIIT INTERNATIONAL CONFERENCE ON  
ADVANCEMENTS IN SCIENCES & HUMANITIES

## Intimate Partner Violence: A problem without a Proper Solution

Ishara Palatuwa\*<sup>1</sup>

<sup>1</sup>\*LL.B (Colombo)

---

### ARTICLE INFO

\* Ishara, Isharamalshani2009@gmail.com

#### Article History:

Received Date: 01 July 2022

Accepted Date: 15 September 2022

---

#### Keywords:

Intimate Partner Violence; immediate action;  
Domestic Violence; Sri Lanka

---

#### Citation:

Ishara Palatuwa. (2022). *Intimate Partner Violence: A problem without a Proper Solution*. Proceedings of SLIIT International Conference on Advancements in Sciences and Humanities, (11) October, Colombo, 120 - 126.

---

### ABSTRACT

In many countries across the world, intimate partner violence is a widespread occurrence. However, there is a distinction in how each jurisdiction has sought to combat it. Different countries have adopted methods to offer victims of IPV urgent remedies so that they do not have to return to an environment where the abuser dwells or, in some situations, restrict the abuser's access. Some nations have even gone so far as to safeguard their children who may be subjected to such abuse. The present study will look at the background of Sri Lanka and how the Sri Lankan government has created mechanisms to guarantee that victims of IPV are safeguarded as soon as they have been abused. The research intends to provide a comparative review of how other jurisdictions have dealt with the issue before concluding with suggestions for the setting of Sri Lanka. It was identified that there are potential actions that can be taken by Sri Lanka such as providing protection under the Victims and Witness Protection scheme and expanding the existing injunction relief to ensure the protection of victims.

## 1. INTRODUCTION

Domestic violence is a problem that demands a comprehensive approach to handle. Even though there are laws and a legal framework in place to combat domestic violence, many gaps in the legal system have made it difficult for victims of domestic violence to receive remedies. The goal of this research is to draw attention to the issue of domestic abuse victims in Sri Lanka not having immediate recourse to ensure their protection. Even though males and female both can be victims of domestic violence<sup>128</sup>, for the purpose of this paper attention is paid to women who have been victims of domestic violence.

The most common immediate action taken by victims in case of domestic violence<sup>129</sup> is filing a complaint with the police and in a majority of cases, the victims have had to revert to the place where the abuser resides. It has been determined that this occurs when the abuser is the victim's legal spouse. This demonstrates an instance of the abuser putting the victim in a more vulnerable situation, regardless of whether the abuser used physical or emotional abuse. Going along with this stance, this article will focus on cases of DV where the abuser is the victim's lawful spouse/partner, which can be identified as intimate partner violence.<sup>130</sup> The main purpose of this study is to examine what other jurisdictions across the world have done to solve this issue and to determine how Sri Lanka may progress by looking at examples from such nations.

## 2. METHODOLOGY

This research takes the form of basic research aimed at developing an understanding of the

subject matter. The research was aided by primary data collected through Google forms. In addition, primary legal sources such as statutes, case law etc. were also perused to gain an overview of the matter. The secondary legal sources perused were books, journal articles, newspapers, websites etc. The tertiary legal sources referred to were research papers from online database collections such as Google Scholar, Lexis Nexis, Law Trobe, Jstor etc.

## 3. What is intimate partner violence?

Historically, IPV was seen as a private/family problem. However, the impact on the victims and the parties involved, particularly children, cast questions on whether it is an entirely a private concern. It is ultimately a societal issue that necessitates a broad set of answers.

It can be seen that victims of IPV are usually females including other vulnerable genders and the abusers in most scenarios are heterosexual males. Due to these particular reasons and the nature of IPV, it has been categorized by researchers, as a form of gendered violence.<sup>131</sup> It is also a gender-sensitive area of concern. Further, IPV is identified as a global public health problem.<sup>132</sup>

IPV against women can be described as physical violence directed against a woman by a current or ex-husband or boyfriend.<sup>133</sup> The term includes sexual violence and can also include psychological violence.<sup>134</sup> Emotional abuse through behaviours such as humiliation, intimidation and controlling actions such as isolation from family and friends are also considered under the context of IPV.<sup>135</sup>

The most common reasons for IPV as identified by researchers are poverty, patriarchy, alcoholism and aggression.<sup>136</sup> Poverty is identified to increase stress among people which in turn can increase the possibility

<sup>128</sup> Elizabeth A Bates, "'No One Would Ever Believe Me': An Exploration of the Impact of Intimate Partner Violence Victimization on Men." (2019) 21 *Psychology of Men & Masculinities*.

<sup>129</sup> Hereinafter referred to as 'DV'.

<sup>130</sup> Hereinafter referred to as 'IPV'.

<sup>131</sup> Rachel Hill, "CYBER-MISOGYNY: SHOULD 'REVENGE PORN' BE REGULATED IN SCOTLAND, and IF SO, HOW?" (2015) 12 *Scripted*.

<sup>132</sup> Achini Jayatilleke and others, "Review: Intimate Partner Violence in Sri Lanka" (2010) 4 *BioScience Trends* 90.

<sup>133</sup> Rachel Jewkes, "Intimate Partner Violence: Causes and Prevention" (2002) 359 *The Lancet*

<<https://sociologyinfocus.com/files/wp-content/uploads/2012/01/intimate-partner-violence-jewkes.pdf>> accessed March 9, 2022.

<sup>134</sup> *Ibid*.

<sup>135</sup> C Nadine Wathen and Harriet L MacMillan, "Children's Exposure to Intimate Partner Violence: Impacts and Interventions" (2013) 18 *Paediatrics and Child Health*.

<sup>136</sup> *Supra* n (4).

of using violence as a form of reducing stress. The notion of patriarchy affects IPV as men seem to look at women as inferior and use violence as a form of exerting their power over women. Studies show that men who are alcoholics tend to display a more violent nature thus leading to severe cases of PV.<sup>137</sup>

### 3.1. Impacts of IPV

According to a study done in Victoria, Australia, IPV was identified to have long-lasting health concerns for victims apart from direct harm to the physical body.<sup>138</sup> These include depression, anxiety, eating disorders and reproductive and physical health problems.<sup>139</sup> In most serious cases, IPV can lead to the death of the victim or grave physical harm.<sup>140</sup> While the direct impact of IPV lies on the victim who is the wife/girlfriend, it is evident that IPV can have impacts on other parties in the setting. The most vulnerable category apart from the direct victim is the children of the union.

Exposure to IPV can bring various harmful impacts on children. A study carried out using a sample of school children in Chilaw, Sri Lanka revealed that IPV had a significant influence on a child's behaviour and psychological status, school performance and attendance.<sup>141</sup> These effects are mostly seen as a form of child abuse and being exposed to IPV has been considered a form of child maltreatment.<sup>142</sup> These can include increased risk of psychological, social, emotional and behavioural problems including mood and anxiety disorders, post-traumatic

stress disorder (PTSD), substance abuse and school-related problems.<sup>143</sup> Children who have been exposed to IPV are at an increased risk of physical, sexual and emotional abuse and neglect.<sup>144</sup> Children who have experienced IPV among their parents tend to be part of an intergenerational cycle of violence.<sup>145</sup> Furthermore, these children who have been exposed to IPV are more likely to experience violent dating and intimate relationships once they become adults.<sup>146</sup>

### 3.2 The Context of Sri Lanka

In Sri Lanka, IPV is considered to be a private matter which does not need the intervention of the public.<sup>147</sup> It is also identified that even though the legal system of the country has given recognition to physical and psychological IPV, no reference is made to the element of sexual violence.<sup>148</sup> As a result, marital rape continues to be an un-criminalized offence in the country.<sup>149</sup> The prevalence of IPV in the country may be determined using existing statistics. South Asia as a whole has higher rates of intimate partner violence. While there has been a paucity of studies to determine the most recent numbers on IPV, past research reveals a prevalence level ranging from 20-72 per cent, with fairly recent publications revealing a range of 25-35 per cent.<sup>150</sup>

Physical health effects of IPV have been observed in Sri Lanka, including head injuries, black eyes, contusions, abrasions, lacerations, and burns. Several research has found that IPV has psychological and mental health

<sup>137</sup> Keith Klostermann and Michelle Kelley, "Alcoholism and Intimate Partner Violence: Effects on Children's Psychosocial Adjustment" (2009) 6 International Journal of Environmental Research and Public Health 3156

<<https://www.mdpi.com/1660-4601/6/12/3156/pdf>>

<sup>138</sup> Theo Vos and others, "Measuring the Impact of Intimate Partner Violence on the Health of Women in Victoria, Australia" (2006) 84 Bulletin of World Health Organization 739.

<sup>139</sup> *Ibid.*

<sup>140</sup> Sharon G Smith, Katherine A Fowler and Phyllis H Niolon, 'Intimate Partner Homicide and Corollary Victims in 16 States: National Violent Death Reporting System, 2003–2009' [2014] American Journal of Public Health.

<sup>141</sup> Stephnie Jayasinghe, Pushpa Jayawardena and Hemamali Perera, 'Influence of Intimate Partner Violence on Behaviour, Psychological Status and School Performance of Children in Sri Lanka' (2009) 15 Journal of Family Studies 274.

<sup>142</sup> C Nadine Wathen and Harriet L MacMillan, "Children's Exposure to Intimate Partner Violence: Impacts and Interventions" (2013) 18 Paediatrics and Child Health.

<sup>143</sup> *Ibid.*

<sup>144</sup> *Supra* n(14)

<sup>145</sup> *Supra* n(14)

<sup>146</sup> *Ibid*

<sup>147</sup> Achini Jayatilleke and others, "Review: Intimate Partner Violence in Sri Lanka" (2010) 4 BioScience Trends 90.

<sup>148</sup> *Ibid.*

<sup>149</sup> Melanie Randall and Vasanthi Venkatesh, 'The Right to No: The Crime of Marital Rape, Women's Human Rights, and International Law' (2015) 41 Brooklyn Journal of International Law.

<sup>150</sup> S Guruge and others, 'Intimate Partner Violence in Sri Lanka: A Scoping Review' (2016) 60 Ceylon Medical Journal 133, M Vidanapathirana, 'Factors Related to Wife-Battering; a Medico-Legal Analysis' (2014) 19 Galle Medical Journal 6, 'Report on Some Observations of the Incidence of Domestic Violence in 4 Locations in Sri Lanka and the Attitudes of the Women towards the Violence' (Centre for Women's Research 2001).

repercussions such as poor self-esteem, suicidal thinking, and suicide attempts.<sup>151</sup> According to the majority of research, Sri Lankan women, in general, do not reveal IPV to anyone and may continue to live in violent relationships that can even go up to ten years. Those who sought help were more likely to approach family, neighbours, friends, and community leaders rather than formal services such as hospitals, police, or agencies providing services.<sup>152</sup> This fact was further affirmed via the survey that was carried out for the current study. Few women have made complaints to the police or taken legal action against the perpetrator while some have even resorted to leaving the country to escape from the abuser. Majority of women who answered the survey revealed that temporary shelter was sought from their close circles including immediate family and friends to escape the abuser. One study available on the matter reported that 13% of women who reported IPV made a complaint to the police and another reported that only a minority of complaints resulted in legal action against the abuser.<sup>153</sup>

### 3.2.1. Legal framework about IPV in Sri Lanka

Sri Lanka has incorporated legal provisions against domestic violence. Prevention of Domestic Violence Act No.34 of 2005<sup>154</sup> was introduced to identify domestic violence as an offence in the country. This has been identified as a progressive movement for a country that can be identified as comprising a heavily patriarchal society.<sup>155</sup>

To punish DV abusers, the Penal Code Ordinance No.2 of 1883 and the Code of Criminal Procedure Act No.15 of 1979 are applied. Section 2 of the PDVA allows "any person" against whom an act of domestic violence has been, is being, or is likely to be committed to apply to the magistrate's court

for a protection order to prevent the act of domestic abuse. As a result, men, women, and children are all entitled to the protections afforded by the PDVA if the parties can establish a domestic relationship between them. In addition, the Constitution of Sri Lanka has incorporated provisions that can be taken as ensuring the protection of women against such harm. Articles 11 and 27 of the Constitution states the following: "the State shall promote with special care the interests of children and youth, to ensure their full development, physical, mental, moral, religious and social, and to protect them from exploitation and discrimination", "No person shall be subjected to torture or cruel, inhuman or degrading treatment or punishment". The Sri Lanka Police and the National Child Protection Authority established by Act No.50 of 1998 are the main government authorities that work towards combatting DV and IPV. The women helpline established by the Ministry of Women, Child Affairs and Social Empowerment receive complaints regarding discrimination against women including IPV. In addition to these mechanisms, the rest of the organizations which play an active role in this are non-governmental organizations.

While existing research shows that there is a lack of victims coming forward to report incidents of IPV and seek help<sup>156</sup>, the solutions provided for victims of IPV seem to be unsatisfactory. This may be characterized as one of the primary reasons why IPV victims are hesitant to seek treatment. Furthermore, in most cases, when victims seek assistance from authorities such as the police, they are returned to the same location where the offenders reside. While this is a serious problem in general, it was exacerbated during the covid-19

<sup>151</sup> Susan Lagdon, Cherie Armour and Maurice Stringer, 'Adult Experience of Mental Health Outcomes as a Result of Intimate Partner Violence Victimization: A Systematic Review' (2014) 5 European Journal of Psychotraumatology 24794.

<sup>152</sup> *Ibid*, Vathsala Jayasuriya<sup>1</sup>, Kumudu Wijewardena<sup>1</sup> and Pia Axemo<sup>2</sup>, 'Intimate Partner Violence against Women in the Capital Province of Sri Lanka: Prevalence, Risk Factors, and Help Seeking' (2011) 17 Violence Against Women, 17.

<sup>153</sup> *Domestic Violence Intervention Services in Sri Lanka: An Exploratory Mapping 2009-2011*. (International Center for Ethnic Studies 2012).

<sup>154</sup> Hereinafter referred to as "PDVA"

<sup>155</sup> Munasinghe and Ishara Kumudumalee, 'The Protection Available for the Elders under the Prevention of Domestic Violence Law; Sri Lankan Perspective', *Heritage as Prime Mover in History, Culture and Religion of South and Southeast Asia, Sixth International Conference of the South and Southeast Asian Association for the Study of Culture and Religion (SSEASR)* (2015), Anusha Edirisinghe, 'Policing in Domestic Violence Act in Sri Lanka' (2022) 4 International Journal for Multidisciplinary Research.

<sup>156</sup> 'Domestic Violence from Intimate Partner: Demographic and Health Survey - 2016, Sri Lanka' (2017) <<http://www.statistics.gov.lk/Resource/en/Health/DemographicAndHealthSurveyReport-2016-Chapter13.pdf>>.



epidemic since most victims were unable to access the existing helplines.<sup>157</sup>

### 3.3 Jurisdictional attempts at curbing IPV

To determine how Sri Lanka as a country may progress in terms of providing protection and pursuing justice for IPV victims, it is vital to examine how other legal systems throughout the world have addressed the same issue. This portion of the study will conduct a comparative assessment of the immediate remedies available to IPV victims in two jurisdictions which seem to have better handled the issue.

**UK:** The immediate recourse a victim of IPV in the UK can take is to contact the authorities through the hotlines. UK government has additionally taken steps to accommodate victims who are not in a position to call and seek support by providing other forms of reporting such as making mobile applications available.<sup>158</sup> These helplines provided for victims can also be used by persons to report incidents relating to people they know as well.

In addition to these measures, the government in collaboration with pharmacy chains and banks across the UK has created safe spaces across the country where victims can walk in and ask for support in very discreet and safe ways.<sup>159</sup> The protection measures available in the UK prevent the abuser (with immediate effect) from returning to the residence and having contact with the victim. The magistrate provides the Domestic Violence Protection Order which extends this restriction for 14-28 days. No molestation order/No harassment Order or occupation order can be taken by the victim which serves as injunctions in the instances where the child of the union is at risk. These orders can be brought in any instance i.e. telephone/email/social media. An occupation order is an injunction that is taken where the victim is living together in a shared home with the perpetrator. The court can order them to move out and stay away or put restrictions such as ordering them to sleep in a separate room. This can be granted together with a no molestation order regarding children as well.<sup>160</sup>

**Singapore:** Same as in the UK the immediate reaction to undergoing IPV in Singapore is to file a police report. Most commonly this occurs in the instance where the danger is serious and imminent such as there has been a previous injury caused by the same offender, instruments of violence have been used along with threatening behaviour, and the offender's behaviour is gradually getting aggressive. After the incident is reported to the police, usually a personal protection order will be ordered to protect the victim from further harm. Expedited orders are in place which is processed even before protection orders where there is an imminent danger to the victim. Domestic exclusion orders restrict the respondent/offender from entering the place where the victim resides. This particular order is ordered where the victim and the abuser reside at the same place, i.e. when the abuser is the spouse of the victim. This kind of mechanism is ideal for Sri Lanka as well since the country has not paid attention to this particular matter of having to revert to the abuser and there is a continued display of abuse is shown in the same victims.<sup>161</sup>

### 3.4 Extending the Victims and Witness Protection law for victims of IPV

IPV is a complex issue with several consequences. Even if a victim comes out and seeks assistance from authorities, this is not the end of the matter. Victims must be protected against abusers who are their husbands or partners. One of the major disadvantages seen in the setting of Sri Lanka is the inclination of authorities to return the victim to the same household where she was abused, compelling the victim to strive to reconcile with the spouse. This has been done in the country to show that it prioritizes 'family values.' What should be highlighted here is that returning the victim to the same site where she was abused, regardless of the intention, is a severe danger that can potentially endanger the victim's life. Furthermore, even if the offender is imprisoned, it cannot be considered the end of the case because the culprit might be freed the

<sup>157</sup> 'Violence against Children and Women during COVID-19-WEEKLY EPIDEMIOLOGICAL REPORT a Publication of the Epidemiology Unit' (Ministry of Health & Indigenous Medical Services 2020).

<sup>158</sup> 'Domestic Abuse: How to Get Help' (GOV.UK2021) <<https://www.gov.uk/guidance/domestic-abuse-how-to-get-help#:~:text=If%20you%20are%20in%20immediate>>

<sup>159</sup> 'Safe Spaces Locations' (UK SAYS NO MORE2022) <<https://uksaysnomore.org/safespaces/>>.

<sup>160</sup> 'Domestic Violence Injunctions' (Rights of Women2014) <<https://rightsofwomen.org.uk/get-information/violence-against-women-and-international-law/domestic-violence-injunctions/>>.

<sup>161</sup> Parvani Pinnewala, 'Good Women, Martyrs, and Survivors' (2009) 15 Violence Against Women 81.

next day and seek revenge. As a result, a strong strategy is required to handle this issue to ensure that the victim is safeguarded throughout.

This is when the victim and witness protection scheme enters the equation. The country's present Victims and Witness Protection legal framework remain accessible for victims and witnesses of any crime<sup>162</sup>, but there have been no known situations in which the same protection has been offered for victims of IPV or DV.

Even though it can be a costly measure to protect the Victims and Witness Protection scheme for victims of IPV as it involves heavy expenses on rent and providing necessities, it must be highlighted that IPV is similar in seriousness to the other crimes where the Victims and Witness Protection scheme has been used.

#### 4. RECOMMENDATIONS AND CONCLUSION

The current study is an attempt to address the existing problem of IPV victims having limited immediate remedy. This study indicated that, while several cultural and socioeconomic causes have contributed to the creation of this gap in the law, there is an urgent need to adopt adequate legislative safeguards to ensure that victims of IPV do not have to repeat the cycle of abuse, endangering their lives.

Sri Lanka may make headway by expanding the present legal framework in terms of injunctions to give stronger protection for victims. The United Kingdom is an excellent example of this, as the country has a thorough injunction process that may prevent further abuse of the victim. Implementing an island-wide safe house network with the assistance of non-governmental organizations is another option to ensure that victims who require urgent safety are safeguarded. In addition to these measures, it was determined that giving protection under the Victims and Witness Protection strategy is a praiseworthy solution to the problem at hand.

#### 5. REFERENCES

- Bates EA, "‘No One Would Ever Believe Me’: An Exploration of the Impact of Intimate Partner Violence Victimization on Men." (2019) 21 *Psychology of Men & Masculinities*.
- Domestic Violence Intervention Services in Sri Lanka: An Exploratory Mapping 2009-2011*. (International Center for Ethnic Studies 2012).
- ‘Domestic Violence from Intimate Partner: Demographic and Health Survey - 2016, Sri Lanka’ (2017) <http://www.statistics.gov.lk/Resource/en/Health/DemographicAndHealthSurveyReport-2016-Chapter13.pdf>.
- ‘Domestic Abuse: How to Get Help’ (GOV.UK2021) <https://www.gov.uk/guidance/domestic-abuse-how-to-get-help#:~:text=If%20you%20are%20in%20immediate>.
- ‘Domestic Violence Injunctions’ (*Rights of Women*2014) <https://rightsofwomen.org.uk/get-information/violence-against-women-and-international-law/domestic-violence-injunctions/>.
- Edirisinghe A, ‘Policing in Domestic Violence Act in Sri Lanka’ (2022) 4 *International Journal for Multidisciplinary Research*.
- Guruge S and others, ‘Intimate Partner Violence in Sri Lanka: A Scoping Review’ (2016) 60 *Ceylon Medical Journal* 133.
- Hill R, “CYBER-MISOGYNY: SHOULD ‘REVENGE PORN’ BE REGULATED in SCOTLAND, and IF SO, HOW?” (2015) 12 *Scripted*.
- Jayasinghe S, Jayawardena P and Perera H, ‘Influence of Intimate Partner Violence on Behaviour, Psychological Status and School Performance of Children in Sri Lanka’ (2009) 15 *Journal of Family Studies* 274.
- Jayasuriya1 V, Wijewardena1 K and Axemo2 P, ‘Intimate Partner Violence against Women in the Capital Province of Sri Lanka: Prevalence, Risk Factors, and Help Seeking’ (2011) 17 *Violence Against Women*.
- Jayatilleke A and others, “Review: Intimate Partner Violence in Sri Lanka” (2010) 4 *BioScience Trends* 90.
- Jewkes R, “Intimate Partner Violence: Causes and Prevention” (2002) 359 *The Lancet*

<sup>162</sup> Section 46 of Assistance to and Protection of Victims of Crime and Witness Act, No. 4 OF 2015.



- <<https://sociologyinfocus.com/files/wp-content/uploads/2012/01/intimate-partner-violence-jewkes.pdf>> accessed March 9, 2022.
- Klostermann K and Kelley M, "Alcoholism and Intimate Partner Violence: Effects on Children's Psychosocial Adjustment" (2009) 6 International Journal of Environmental Research and Public Health 3156 <<https://www.mdpi.com/1660-4601/6/12/3156/pdf>> accessed March 9, 2022.
- 'Safe Spaces Locations' (UK SAYS NO MORE2022) <https://uksaysnomore.org/safespaces/>.
- Lagdon S, Armour C and Stringer M, 'Adult Experience of Mental Health Outcomes as a Result of Intimate Partner Violence Victimization: A Systematic Review' (2014) 5 European Journal of Psychotraumatology 24794.
- Munasinghe and Kumudumalee I, 'The Protection Available for the Elders under the Prevention of Domestic Violence Law; Sri Lankan Perspective', *Heritage as Prime Mover in History, Culture and Religion of South and Southeast Asia, Sixth International Conference of the South and Southeast Asian Association for the Study of Culture and Religion (SSEASR)* (2015).
- Pinnewala P, 'Good Women, Martyrs, and Survivors' (2009) 15 Violence Against Women 81.
- Randall M and Venkatesh V, 'The Right to No: The Crime of Marital Rape, Women 'S Human Rights, and International Law' (2015) 41 Brooklyn Journal of International Law.
- 'Report on Some Observations of the Incidence of Domestic Violence in 4 Locations in Sri Lanka and the Attitudes of the Women towards the Violence' (Centre for Women's Research 2001).
- Smith SG, Fowler KA and Niolon PH, 'Intimate Partner Homicide and Corollary Victims in 16 States: National Violent Death Reporting System, 2003–2009' [2014] American Journal of Public Health.
- Vidanapathirana M, 'Factors Related to Wife-Battering; a Medico-Legal Analysis' (2014) 19 Galle Medical Journal 6.
- Vos T and others, "Measuring the Impact of Intimate Partner Violence on the Health of Women in Victoria, Australia" (2006) 84 Bulletin of World Health Organization 739.
- 'Violence against Children and Women during COVID-19-WEEKLY EPIDEMIOLOGICAL REPORT a Publication of the Epidemiology Unit' (Ministry of Health & Indigenous Medical Services 2020).
- Wathen CN and MacMillan HL, "Children's Exposure to Intimate Partner Violence: Impacts and Interventions" (2013) 18 Paediatrics and Child Health.



## A Dialogue on the Effectiveness of Section 308A and Section 341 of the Penal Code in Discouraging Corporeal Punishments

Shiran Harsha Widanapathirana<sup>\*1</sup>

<sup>1</sup>Asia Pacific Institute of Information Technology,

### ARTICLE INFO

#### Article History:

Received Date: 01 July 2022

Accepted Date: 15 September 2022

#### Keywords:

Corporeal punishments; Best interests; Children; Child rights

#### Citation:

Shiran Harsha Widanapathirana. (2022). *A Dialogue on the Effectiveness of Section 308A and Section 341 of the Penal Code in Discouraging Corporeal Punishments*. Proceedings of SLIIT International Conference on Advancements in Sciences and Humanities, (11) October, Colombo, 127 - 133.

### ABSTRACT

Corporeal punishments can be identified as a method of punishment that can be traced a long way back in history as a method that is utilized to ensure compliance and discipline. It is quite well known that the same method is used in various degrees to discipline children at schools and even within the unit of a family. However, it is proven by research that such punishments can have devastating effects on the well-being of children, thus, the claims on punishments being imposed in the best interests of the children might be considered ineffective due to lack of evidence and the severity of the consequences of imposing corporeal punishments to children. Thus, the purpose of this research was to conduct a dialogue on the capability of criminal law on ensuring protection for children against acts of violence within the school system via a focused emphasis on the competency of Section 308A (1995 Amendment) and Section 341 of the Penal Code through utilizing the epistemological approach and the black letter approach of qualitative research. The research findings depicted that the relevant Sections considered within the course of the research has potential in terms of ensuring protection for children from acts of cruelty against children in the school atmosphere. The provisions further attempt to strike a balance between reasonable acts to ensure student wellbeing and acts that can be considered as being influenced by malice and cruelty, yet, with limitations that leave room for improvements.

<sup>\*</sup> Harsha, harsha@apiit.lk

## INTRODUCTION

*“While Corporal Punishment does not amount to torture in itself in the instant case, the practice of infliction of physical or mental punishment which disregards the inherent dignity of a child amounts to inhuman or degrading punishment.”<sup>163</sup>*

*“... interpretation of a child’s best interests must be consistent with the whole Convention, including the obligation to protect children from all forms of violence and the requirement to give due weight to the child’s views; it cannot be used to justify practices, including corporal punishment and other forms of cruel or degrading punishment, which conflict with the child’s human dignity and right to physical integrity.”<sup>164</sup>*

As per Article 1 of the United Nations Convention on the Rights of the Child (hereinafter referred to as UNCRC) a child is identified as a person whose age is below 18 years in the absence of legal provisions under which the age of majority can be obtained at an earlier age.<sup>165</sup> Ensuring protection for children in a manner that paves the way for their effective development is considered a key state responsibility as per various national and international legal instruments including the UNCRC.<sup>166</sup> Supportively, Article 27 (13) of the Second Republican Constitution (1978) of Sri Lanka has recognized the obligation of the state

to promote the interests of children and youth with special care to ensure their effective development in physical, moral, social, religious and mental dimensions while guaranteeing that they are not discriminated and exploited.<sup>167</sup>

Corporeal punishments can be identified as the imposition of bodily pain or harm as a means of punishing an individual for a certain reason or reasons.<sup>168</sup> The same is defined by the United Nations Committee on the Rights of the Child as any physical force imposed to cause any harm or discomfort irrespective of how legitimate it can be.<sup>169</sup> Corporeal punishments may be perceived as an acceptable and preferred method of punishment for various crimes in states worldwide, mainly due to the deterrent effect that it injects into the minds of potential offenders, and the same has the tendency of being used to discipline children in varying degrees as well. The practice of inflicting pain on discipline-related concerns can be observed, especially in terms of children, when various incidents and case law precedents are considered within the Sri Lankan context. Adding to the aforementioned point of discussion, the increase of the complaints received by the National Child Protection Authority, from 905 to 2413 from the year 2009 to 2018, on cruelty to children further increases the degree of consideration needed for tackling the infliction of corporeal punishments.<sup>170</sup>

<sup>163</sup> *HM Karunapala and others v Premakumara Siriwardena* [2022] (Supreme Court of Sri Lanka)

<sup>164</sup> 'General Comment No. 8 (2006): The Right Of The Childlight. Most involves hitting (“smacking”, “slapping”, To Protection From Corporal Punishment And Other Cruel Or “spanking”) children, with the hand or with an implement – Degrading Forms Of Punishment (Arts. 19; 28, Para. 2; Andwhip, stick, belt, shoe, wooden spoon, etc. But it can also 37, Inter Alia)' (UN Committee on the Rights of the Childinvolve, for example, kicking, shaking or throwing children, 2007)scratching, pinching, biting, pulling hair or boxing ears, forcing children to stay in uncomfortable positions, burning, scalding or forced ingestion (for example, washing children’s mouths out with soap or forcing them to swallow hot spices). In the

<sup>165</sup> United Nation’s Convention on the Rights of the Child  
<sup>166</sup> 'Child Rights and Why They Matter' (*Unicef.org*, 2022)view of the Committee, corporal punishment is invariably degrading. In addition, there are other non-physical forms of punishment which are also cruel and degrading and thus incompatible with the Convention. These include, for example, children,water%2C%20housing%20and%20environmental%20pa punishment which belittles, humiliates, denigrates, ollution.> accessed 3 September 2022.

<sup>167</sup> In terms of the international sphere, The Universal'General Comment No. 8 (2006): The Right Of The Child To Declaration of Human Rights (hereinafter referred to asProtection From Corporal Punishment And Other Cruel Or UDHR) and the ILO Convention No. 182 (1999) on the WorstDegrading Forms Of Punishment (Arts. 19; 28, Para. 2; And Forms of Child Labour, among many such standards on various37, Inter Alia)' (UN Committee on the Rights of the Child disciplines as such, stresses on the importance of ensuring(CRC) 2007) protection for children in terms of matters that can impose<<https://www.refworld.org/docid/460bc7772.html>> accessed negative implications on their effective development. 20 June 2022.

<sup>168</sup> 'Corporeal Punishment' (*Encyclopedia Britannica*, 2022)<sup>170</sup> Manel Gunasekara, 'Child Protection In Sri Lanka Is A National Crisis - Colombo Telegraph' (*Colombo Telegraph*, 2020) <<https://www.colombotelegraph.com/index.php/child->

Thus, in a state of time where due consideration of child safety should be ensured, a question remains as to how effective the Sri Lankan legal system is in terms of ensuring protection for children in the school system, especially from punishments that may hinder their effective physical and mental development. Therefore, the purpose of this research is to identify and evaluate the salient features and precedents in Sri Lanka on Section 341 and Section 308A of the Penal Code concerning imposing corporeal punishment for children followed by an emphasis on the role of law in ensuring the right to dignity and physical integrity of children.

## MATERIALS AND METHODS

The research was conducted with the view of developing a brief dialogue on the application of Section 341 of the Penal Code and Section 308A of the Penal Code (Amendment) Act, No. 22 of 1995 on their perspectives on corporeal punishments against children. Coinciding with the intentions of the research, the epistemological approach and the black letter approach of qualitative research has been utilized by the writer to evaluate and illustrate the practical applications of the Sections considered within the course of the research with a brief emphasis on probable obstacles, legal and social, that might affect the application of such laws as intended by the legislature in the paradigm of cruelty to children.

## RESULTS AND DISCUSSION

The UNCRC, for which Sri Lanka is a signatory, expressly and unconditionally requires state parties to the Convention to *“take all appropriate measures to ensure that school discipline is administered in a manner consistent with the child's human dignity and in conformity with the present Convention.”* However, according to research conducted in

2018 with a sample of 459 teachers and 948 students from six districts in Sri Lanka, it is reported that in certain cases teachers have utilized aversive methods of punishment such as psychological aggression and corporeal punishments within the education system. Such methods include beating with a stick, kneeling, throwing an item at the child, and caning and pulling an ear. However, interestingly, it was noted by the research that hitting by the hand is the most commonly used method of punishment.<sup>171</sup> The findings of the research further enumerated that more than 70% of the students have experienced some form of physical or psychological aggression whereas more than 50% of the students have experienced at least a single incident of physical abuse as a punishment at their respective schools.<sup>172</sup> However, it should also be noted that the research has further identified that over 70% of the students indicated instances of positive disciplinary methods, where the students are educated on the correct course of behaviour by the teacher without resorting to violence. Such positive practice can be considered as a glimpse of hope that can make a real contribution to the effective development, physical and mental, of children without bringing about negative implications on the lives of children.

When corporeal punishments are considered, even though there may be a notion between the members of the society that such punishments might ensure the wellbeing of the child, in other words, promote the best interests of the child, the negative repercussions that such methods might have on the wellbeing of children should also be considered.<sup>173</sup> In responding to the aforementioned objective, considering the position of the World Health Organization (hereinafter referred to as WHO) is of utmost importance as it is recognized by the WHO that corporeal punishments can result in harmful physiological and psychological responses

protection-in-sri-lanka-is-a-national-crisis/> accessed September 2022.

<sup>171</sup> 'Sri Lanka | Global Initiative To End All Corporal Punishment Of Children' (*Endcorporalpunishment.org*, 2022) <sup>173</sup> Brendan Smith, 'The Case Against Spanking'

<<https://endcorporalpunishment.org/reports-on-every-state-and-territory/sri-lanka/#:~:text=In%20the%20first%20large%20scale,punishm>

<sup>172</sup> Piyanjali de Zoysa, Upul Senarath and Harendra de Silva, 'Disciplining In Sri Lankan Schools: A Cross-Sectional Study'

6(2018) 36 Journal of Interpersonal Violence  
<<https://pubmed.ncbi.nlm.nih.gov/30379110/>> accessed 20

June 2022.  
<<https://www.apa.org>,  
<<https://www.apa.org/monitor/2012/04/spanking#:~:text=Ma>

ny%20studies%20have%20shown%20that,mental%20health  
ent%20in%20the%20past%20term.> accessed 20 June 2022.  
%20problems%20for%20children.> accessed 20 June 2022.

leading to the development of feelings such as guilt, sadness and stress which may subsequently lead to changes in the brain structure as well as how it functions.<sup>174</sup>

Furthermore, to accumulate justifications to evaluate whether imposing corporeal punishments should not be considered trivial, an article on 'Daily News' dated April 29<sup>th</sup> of 2019 reported multiple incidents of suicide by children that are triggered due to various punishments imposed on them, which includes physical punishments, can be considered.<sup>175</sup> The article, via citing a research conducted in the United States of America, has further identified multiple harmful physical and mental conditions such as anxiety disorders, substance abuse or dependence and personality disorders that can occur at a later stage in the lives of children as a result of excessive punishments used against them.<sup>176</sup> Thus, it can be established as a conclusion that punishments, including corporeal punishments, that are directed towards children contain a clear potential to impose widely negative implications on the wellbeing of children in multiple ways.<sup>177</sup> Such tendency to cause harm therefore can be considered as a justification to subject acts of punishment on children within the legal framework of any country and thereby ensure that cruelty against children will not be promoted.

In analyzing the Sri Lankan position on the imposition of corporeal punishments, one of the recent developments that should be considered is the Penal Code (Amendment) Act, No. 22 of 1995, among the Second Republican Constitution and the Children and Young Persons Ordinance, No. 48 of 1939, which introduced provisions that can be used to impose a reasonable degree of control over subjecting children to corporeal punishments. Section 308A of the Penal Code (Amendment)

Act, No. 22 of 1995 specifically identifies cruelty against children as a punishable offence. The importance of the Section is clearly depicted in the manner in which it is used as the statistics from The National Child Protection Agency which reports 2741 cases under Section 308A in the year 2021.<sup>178</sup> A person found guilty under the Section can be subjected to imprisonment of either description for a term not less than two years and not exceeding ten years, in addition to the obligation to pay fines and compensation, as the case may be.

The notable aspect within the aforementioned Section is the 'persons' who can be responsible under cruelty against children, which only include, persons having the custody, charge or care of the child. Therefore, it should be noted that Section 308A will not be applicable to any individual even though the individual has conducted himself/herself in a way that caused harm to a child, which amounts to cruelty. Thus, the said factor denotes that if a person who is not coming under the aforementioned description imposes harm to a child, such person may be prosecuted under a different legal provision such as grievous hurt under Section 311 of the Penal Code.<sup>179</sup> Considering the aforementioned matters under the current point of discussion, it can therefore be understood that a teacher who might punish a student under such capacity can be held liable under Section 308A as a student can be considered to be a child who is under the protection and care of teachers during the time that they spend at schools.

However, as noted by Mr. Prasantha Lal De Alwis (PC), the question of the standard required for an act to be 'willful' in terms of Section 308A of the Penal Code can also be a moot point.<sup>180</sup> Black's Law Dictionary defines the term 'willful' as "proceeding from a conscious motion of the will; intending the

<sup>174</sup> 'Corporal Punishment And Health' (*Who.int*, 2022) Health Care <<https://pubmed.ncbi.nlm.nih.gov/12734459/>> <<https://www.who.int/news-room/fact-sheets/detail/corporal-punishment-and-health#:~:text=Corporal%20punishment%20triggers%20harm%20psychological,that%20support%20dealing%20with%20danger.>> accessed 20 June 2022.

<sup>175</sup> Usha Perera, 'Hurt That Doesn't Heal' (*Daily News*, 2022) <<https://www.dailynews.lk/2019/04/29/features/184056/hurt-doesn%E2%80%99t-heal>> accessed 20 June 2022.

<sup>176</sup> *ibid*

<sup>177</sup> Christine A. Ateah, M.Loretta Secco and Roberta L. Woodgate, 'The Risks And Alternatives To Physical Punishment Use With Children' (2003) 17 *Journal of Pediatric*

<sup>178</sup> 'Statistics | National Child Protection Authority' (2022) <<https://www.childprotection.gov.lk/resource-centre/statistics-3>> accessed 6 September 2022.

<sup>179</sup> 'BASL Sinhala Webinar 2.39 - ළමයින්ට එරෙහි වධහිංසාව සහ නීතිය' (Youtube.com, 2022) <<https://www.youtube.com/watch?v=Ii0kblOW6Qw>> accessed 20 June 2022.

result which actually conies to pass”, which represents a higher degree of motivation and the need to bring about the results intended from a certain act. The question that arises due to a strict interpretation provided to the term ‘willful’ in terms of corporeal punishments is when a teacher punishes a student as a disciplinary mechanism and subsequently injures the student as in such cases, it can be argued that the necessary degree of intention required to be held accountable under the Section is not satisfied because the teacher has imposed punishments with the intention of disciplining the child as opposed to willfully imposing harm to the child.

For instance, in the case, *Mohomad Mustapha Faiz v. The Attorney General*<sup>181</sup> where a distinction was made by the court between a willful act to bring a determined or expected harm and a spontaneous reaction without any malice, ill-will, hatred or venom can be considered.<sup>182</sup> The child, in the present case, has not complied with a request made by a teacher to fetch a certain amount of cool water from a nearby house due to an injured toe. The teacher, following the rejection by the student, used a cricket bat and struck the student/victim in the legs a few times and injured the student/victim, which led to the present case under discussion. Under such circumstances, a reasonable interpretation of the judgement with due respect to the court can be made saying that a person who decides to assault or strike a person with an object such as a cricket bat may have a certain intention to cause harm in the process of doing so. However, the requirement for the act being ‘Willful’ has made a significant impact on the outcome of the

judgement as the actions of the accused were referred to as ‘severe discipline’ as opposed to ‘cruelty’.

Even though the aforementioned judgment appears to be providing an acceptable justification for not finding the teacher/accused criminally liable for measures taken to discipline a child, such a perspective might contradict the international standards that are applicable for the same.<sup>183</sup> For instance, Article 1 of the UDHR firmly stresses that all humans are born equal and free and are entitled to dignity and rights whereas Article 3 stipulates that every person has the right to life, liberty and security. Furthermore, it is also stated in Article 5 of the UDHR, similarly to Article 7 of the International Covenant on Civil and Political Rights, that no person shall be subjected to any torture, cruel, inhuman or degrading treatment in addition to the former provisions considered from the UNCRC. Thus, it is questionable as to whether there is a sufficient degree of respect that the law provides to the physical integrity and dignity of a child when he/she is subjected to corporeal punishments due to the influence of complications involving legal terms.

In addition to Section 308A, it should also be noted that Section 341 of the principal enactment (Penal Code) can also be utilized in ensuring protection for children from acts of cruelty.

The Section finds any act of criminal force which may annoy, fear or injury to the person against whom such force is directed to be a punishable offence.<sup>184</sup> When considering the aforementioned provision, a reasonable person

<sup>181</sup> *Mohomad Mustapha Faiz v The Attorney General* [2011] *Mohomad Mustapha Faiz v The Attorney General* [2011] Court of Appeal (Court of Appeal).

<sup>182</sup> “‘Wilful’ connotes a deliberate intention on the part of the doer as opposed to an inadvertent act. Considering the facts that society in the spirit of understanding, peace, and tolerance. The led to this incident, it is apparent that this is not the result of ause of Corporal Punishment is antithetical to these values. We pre-meditated or preplanned act. It was more a sudden reaction cannot subject the child to torture and still expect him to act and in the absense of any evidence of personal animosity or awith understanding, peace and tolerance towards others and be vendetta the act is devoid of any venom or vengeance. Whether a protagonist of peace and love. It was probably for this reason asking the child to bring a bottle of cool water from a Mahatma Gandhi said that “if we are to reach real peace in this neighbouring house is permissible or not is not the point ofworld, and if we are to carry on a real war against war, we shall argument in this instance. Whether it is permissible orhave to begin with children, And if they will grow up in their otherwise, as the child had not complied with the request thenatural innocence, we won't have to struggle, we won't have to appelland had reacted in the manner as unfolded in evidence.pass fruitless idle resolutions, but we shall go from love to love His manner of approaching the situation could be viewed asand peace to peace, until at last all the corners of the world are excessive. However as evident from the whole episode it was acovered with that peace and love for which, consciously or spontaneous reaction without any malice, ill-will, hatred orunconsciously, the whole world is hungering.” venom, which if been present would have led to the inference *Parents Forum for Meaningful Education vs Union of India and Another* 89 (2001) DLT 705 of such act being ‘wilful’.”

<sup>184</sup> *ibid*

might find it difficult to relate the same to a punishment imposed by a teacher on a student, which is addressed by Illustration (i) under Section 341. The illustration indicates “a schoolmaster, in the reasonable exercise of his discretion as master, flogs B, one of his scholars. A does not use criminal force to B, because, although A intends to cause fear and annoyance to B, he does not use force illegally.”, which raises a question as to whether a teacher is permitted to punish a student without any fear of consequences imposed by law.

In the effort to discover a solution for the said question, it can be noted that the terms ‘reasonable exercise’ and ‘discretion’ provides a certain degree of flexibility for a teacher who might exercise force on a student, by way of a corporeal punishment, which might provide a sound opportunity to evade the application of this Section. Therefore, Section 341, according to the writer, can be considered as a Section which approves reasonable punishments imposed by teachers on students, as per illustration (i), which may reflect the societal norms that existed when such a law was initially introduced.<sup>185</sup>

## CONCLUSION

It can be agreed that subjecting a child to corporeal punishments is a violation of human rights.<sup>186</sup> The rich line of case laws as decided by the Supreme Court of Sri Lanka specifically suggests the capability of an aggrieved child to initiate cases involving the breach of fundamental rights against corporeal punishments under Article 11 of the Constitution. For instance, the decision provided by Kulatunga J. in the case of *Bandara V Wickremasinghe*<sup>187</sup> can be considered.<sup>188</sup> Thus, positive light is shed by the judiciary of Sri Lanka by accepting the possibility to utilize the

jurisdiction of fundamental rights in ensuring protection for children from cruelty irrespective of the existing offences regarding the same in the Penal Code, among other specific laws on the same.

On the other hand, corporeal punishments do not consist of a guarantee that there will be discipline but contain the tendency to lead to a cycle of violence due to the impact that it can have on the mental health of the victims.<sup>189</sup> When the legal framework, concerning Section 308A and 341 of the Penal code, and its practical application as depicted in the former parts of this discussion it is questionable to a certain extent as to whether the attempt made to mitigate and overcome the effects of corporeal punishments to children through the Penal Code, with devoted sections of the law, at schools is effective and efficient. It is quite clear that the Sri Lankan legislature has made timely efforts in bringing various methods of protection via statutory amendments to mitigate corporeal punishments, yet, the findings suggest that there is a need to develop in terms of practical application.

Alternatively, it should further be noted that the existing legal instrument can still be effectively utilized in a manner that can ensure and guarantee the best interests of children at schools while combining the law with continuous education and raising awareness,<sup>190</sup> by ensuring proper reporting of incidents and continuous monitoring, among other options. An argument can be made in favour of corporeal punishments and the protection provided to guardians and parents of children about certain types of punishments, yet, the law in such regard should be thorough and certain which will depict a clear standard in terms of the acceptable course of conduct even in the process of acting in the best interests of the child. Hence, the writer believes that

<sup>185</sup> Ibid

<sup>186</sup> Michele Knox, 'On Hitting Children: A Review Of Corporalis restored. That would in some way guarantee his future mental Punishment In The United States' (2010) 24 Journal ofhealth, which is vital to his advancement in life.”  
Pediatric Health Care<sup>189</sup> Boungho Choi, 'Cycle Of Violence In Schools: Longitudinal  
<<https://pubmed.ncbi.nlm.nih.gov/20189062/>> accessed 20Reciprocal Relationship Between Student’S Aggression And  
June 2022. Teacher’S Use Of Corporal Punishment' (2017) 36 Journal of  
Interpersonal Violence

<sup>187</sup> *Bandara V Wickremasinghe* (1995) 2 SLR 167

<sup>188</sup> “I agree that discipline of students is a matter within the purview of schoolteachers. It would follow that whenever theyJune 2022.

purport to maintain discipline, they act under the colour of<sup>190</sup> Eid Bassam and others, 'Corporal Punishment Of Children: office. If in doing so, they exceed their power, they mayDiscipline Or Abuse?' (2018) 13 Libyan Journal of Medicine become liable for infringement of fundamental rights by<<https://www.tandfonline.com/doi/full/10.1080/19932820.2018.1485456>> accessed 20 June 2022. executive or administrative action.” “This Court must by8.1485456> accessed 20 June 2022. granting appropriate relief reassure the petitioner that the

Section 308A and Section 341, as discussed within the course of the discussion, can therefore be considered as Sections with justifications with room for improvement in terms of their practical application and usage in the context of child development and wellbeing.

## ACKNOWLEDGEMENT

Sincere thanks to the organizing committee of the Webinar Series of the Bar Association of Sri Lanka and the respective resource persons for giving a basis to conduct research in the area of corporeal punishments and the law.

## REFERENCES

- Ateah C, Secco M, and Woodgate R, 'The Risks And Alternatives To Physical Punishment Use With Children' (2003) 17 Journal of Pediatric Health Care <<https://pubmed.ncbi.nlm.nih.gov/12734459/>> accessed 20 June 2022
- 'BASL Sinhala Webinar 2.39 - ළමයින්ට එරෙහි වධහිංසාව සහ නීතිය' (Youtube.com, 2022) <<https://www.youtube.com/watch?v=li0kbLOW6Qw>> accessed 20 June 2022
- Bassam E and others, 'Corporeal Punishment Of Children: Discipline Or Abuse?' (2018) 13 Libyan Journal of Medicine <<https://www.tandfonline.com/doi/full/10.1080/19932820.2018.1485456>> accessed 20 June 2022
- Choi B, 'Cycle Of Violence In Schools: Longitudinal Reciprocal Relationship Between Student'S Aggression And Teacher'S Use Of Corporeal Punishment' (2017) 36 Journal of Interpersonal Violence <<https://pubmed.ncbi.nlm.nih.gov/29294980/>> accessed 20 June 2022
- 'Corporeal Punishment' (Encyclopedia Britannica, 2022) <<https://www.britannica.com/topic/corporeal-punishment>> accessed 20 June 2022
- 'Corporeal Punishment And Health' (Who.int, 2022) <<https://www.who.int/news-room/fact-sheets/detail/corporeal-punishment-and-health#:~:text=Corporeal%20punishment%20triggers%20harmful%20psychological,that%20support%20dealing%20with%20danger.>>> accessed 20 June 2022
- de Zoysa P, Senarath U, and de Silva H, 'Disciplining In Sri Lankan Schools: A Cross-Sectional Study' (2018) 36 Journal of Interpersonal Violence <<https://pubmed.ncbi.nlm.nih.gov/30379110/>> accessed 20 June 2022
- 'General Comment No. 8 (2006): The Right Of The Child To Protection From Corporeal Punishment And Other Cruel Or Degrading Forms Of Punishment (Arts. 19; 28, Para. 2; And 37, Inter Alia)' (UN Committee on the Rights of the Child (CRC) 2007) <<https://www.refworld.org/docid/460bc7772.html>> accessed 20 June 2022
- Knox M, 'On Hitting Children: A Review Of Corporeal Punishment In The United States' (2010) 24 Journal of Pediatric Health Care <<https://pubmed.ncbi.nlm.nih.gov/20189062/>> accessed 20 June 2022
- Perera U, 'Hurt That Doesn'T Heal' (Daily News, 2022) <<https://www.dailynews.lk/2019/04/29/features/184056/hurt-doesn%E2%80%99t-heal>> accessed 20 June 2022
- Smith B, 'The Case Against Spanking' (<https://www.apa.org>, 2022) <<https://www.apa.org/monitor/2012/04/spanking#:~:text=Many%20studies%20have%20shown%20that,mental%20health%20problems%20for%20children.>>> accessed 20 June 2022
- 'Sri Lanka | Global Initiative To End All Corporeal Punishment Of Children' (Endcorporealpunishment.org, 2022) <<https://endcorporealpunishment.org/reports-on-every-state-and-territory/sri-lanka/#:~:text=In%20the%20first%20large%20scale,punishment%20in%20the%20past%20term.>>> accessed 20 June 2022
- Mohomad Mustapha Faiz v The Attorney General [2011] Court of Appeal (Court of Appeal)





2022  
**SICASH**  
SLIIT INTERNATIONAL CONFERENCE ON  
ADVANCEMENTS IN SCIENCES & HUMANITIES

## Prosecuting Sexual Bribery in Sri Lanka: A study on Sexual Bribery and 'Consent' of the Victim

Kamini Rathnayake<sup>1</sup>

<sup>1</sup>Independent Researcher (Sri Lanka), Reading for Postgraduate Diploma in Gender and Women's Studies (University of Colombo, SL), LLB (Hons) Law (Liverpool John Moores University, UK).

---

\* Kamini, rathnayakekamini@gmail.com

---

### ARTICLE INFO

---

#### Article History:

Received Date: 01 July 2022

Accepted Date: 15 September 2022

---

#### Keywords:

Sexual Bribery; Sextortion; Coerced Consent; Bribery and Corruption; Bribery Act

---

#### Citation:

Kamini Rathnayake. (2022). *Prosecuting Sexual Bribery in Sri Lanka: A study on Sexual Bribery and 'Consent' of the Victim*. Proceedings of SLIIT International Conference on Advancements in Sciences and Humanities, (11) October, Colombo, 134 - 139.

### ABSTRACT

---

The ability to prosecute Sexual Bribery (SB) in Sri Lanka (SL) is owed to statutory interpretation. However, SB of only public servants is considered bribery, whereas SB of private sector employees is considered as a sexual offence, thus entirely misrepresenting the gravity of the offence. While it is vital to address this discrepancy, it is equally important to classify SB under bribery and corruption. International review and research suggest the concept of 'coerced consent' to tackle the issues of prosecuting SB under laws for sexual offences. This study analyses that until SL amends its laws to expressly criminalise SB, in both public and private sectors, statutory interpretation of 'coerced consent' being incorporated into the legal system of SL seems a promising means to resolve this.

## INTRODUCTION

SB, sometimes known as ‘Sextortion’, is internationally defined as the abuse of power or authority entrusted to one, to gain a sexual benefit or advantage.<sup>191</sup> SB in SL is prosecuted as per statutory interpretation. In the absence of express provisions to penalise offences, courts and judges interpret existing provisions, by probing into the intention of the legislature in introducing the offence, subject to certain “rules”<sup>192</sup>. “... [T]he “meaning” is discovered, generally by consulting the “materials,” the debates in the legislature, the reports of commissions, and the like.”<sup>193</sup> SB is not an explicitly recognised offence within the legal system of the country, hence the lack of a proper definition. This means that our understanding of SB, both in society and the legal sector is both limited and inconsistent, which creates a lacuna that needs to be addressed.

Existing literature on SB in SL suggests realities that negatively affect the reporting and prosecution of SB, leading to very few reported cases of SB in SL. From 2010-2019 only 13 cases have been reported to the Commission to Investigate Allegations of Bribery or Corruption (CIABOC), with only six being prosecuted.<sup>194</sup> There is only one known case tried in a superior court, which set a judicial precedent to include SB under the Bribery Act (No. 11 of 1954) (hereinafter referred to as ‘the Bribery Act’). - *Kathubdeen V. Republic of Sri Lanka (1998)*. The

Court of Appeal, in this case, provided statutory interpretation under Section 90 of the Bribery Act, for the term ‘gratification’ “....to include among other things, “any other service favour or advantage or any descriptive whatsoever”...”.<sup>195</sup>

In 2017, the United Nations Committee on the Elimination of Discrimination against Women (CEDAW) reiterated and recommended that SL statutorily amend the Bribery Act to include the offence of SB.<sup>196</sup> Articles 11<sup>197</sup> and 12<sup>198</sup> of the Constitution of SL and the Establishments Code<sup>199</sup> may be used as guidance to define and expand on the concept of SB. SL primarily, however not explicitly, recognises and penalises this offence under Section 19 (for committing) and Section 25 (for attempting and abetting) of the Bribery Act. Section 158 of Penal Code Ordinance No. 2 of 1883 (hereinafter referred to as ‘the Penal Code’) although not explicitly, also recognises the same. However, both are categorically applicable to ‘public servants’, thus excluding their enforcement in the private sector. Consequently, SB in SL against private sector employees is prosecuted as sexual offences as per Section 345 of the Penal Code.

International literature suggests SB needs to be perceived through the lens of corruption, rather than sexual offences to prevent the downsides of the latter being imposed on a victim of SB<sup>200</sup>, hence the discussion of “consent of the victim”. Thus, the discrepancy between the prosecution of a public servant vis-a-vis a

<sup>191</sup> Hazel Feigenblatt, ‘Breaking the Silence around Sextortion: The Links between Power, Sex and Corruption’ (2020), 8  
<[https://images.transparencycdn.org/images/2020\\_Report\\_breakingsilencearoundsextortion\\_English.pdf](https://images.transparencycdn.org/images/2020_Report_breakingsilencearoundsextortion_English.pdf)> accessed 21 August 2022.

<sup>192</sup> Golden Rule, Mischief Rule, Literal Rule

<sup>193</sup> Max Radin, ‘Statutory Interpretation’ (1930) 43 Harvard Law Review 863  
<<https://www.jstor.org/stable/1330769?origin=crossref>> accessed 8 September 2022.

<sup>194</sup> ‘Sexual Bribery: The Silenced Side of Corruption’ *Daily FT, Wijeya Newspapers Ltd* (2020)  
<<https://www.ft.lk/Opinion-and-Issues/Sexual-bribery-The-silenced-side-of-corruption/14-705482>> accessed 21 August 2022.

<sup>195</sup> Kathubdeen V. Republic of Sri Lanka (1998) 3 SLR 107.

<sup>196</sup> UN. Committee on the Elimination of Discrimination against Women (66th sess. : 2017 : Geneva), ‘Concluding Observations on the 8th Periodic Report of Sri Lanka : Committee on the Elimination of

Discrimination against Women’ 13 (UN, 2017)  
<<https://digitallibrary.un.org/record/1286137?Ln=en#record-files-collapse-header>> accessed 21 August 2022.

<sup>197</sup> Article 11 - Freedom from torture. No person shall be subjected to torture or to cruel, inhuman or degrading treatment or punishment.

<sup>198</sup> Article 12 - Right to equality. (1) All persons are equal before the law and are entitled to the equal protection of the law. (2) No citizen shall be discriminated against on the grounds of race, religion, language, caste, **sex**, political opinion, place of birth or any one of such grounds.

<sup>199</sup> Establishments Code, Volume II, Chapter XLVII, Rule 28 - ‘Disciplinary action against a Public Officer in view of orders issued against him by a Court of Law or Statutory Authority’.

<sup>200</sup> Nancy Hendry, ‘Sextortion: Sexual Offence or Corruption Offence?’ (*Transparency International*, 2020)  
<<https://www.transparency.org/en/blog/sextortion-sexual-offence-or-corruption-offence>> accessed 21 August 2022.

private sector employee for SB, under bribery and corruption laws for the former and sexual offences laws for the latter, creates a conundrum of the double standards placed by the law, on the same offence within the same land. International research and review suggest the concept of 'coerced consent' to be considered in cases of SB. However, how this is reflected in the SL law, in theory, and practice has not been studied. This study addresses this poorly analysed inconsistency within the legal system of SL, by attempting to answer the questions of whether the 'consent' of the victim is necessary to be considered in cases of SB and whether the 'consent' given in such situations can be regarded as informed and complete.

## MATERIALS AND METHODS

This study was carried out as empirical qualitative research. Primary legal sources of the local and international legislature and secondary sources of local and international articles, reports and lobby documents found on the respective organisational websites, were used in this study. The research was conducted as desk research owing to the limitations caused by the current situation of the country.

This study is driven by the hypothesis that the concept of 'coerced consent' being incorporated into all legal provisions prosecuting SB through statutory provision is the means to tackle the discrepancy of prosecuting SB under bribery and corruption laws and sexual offences laws.

### The legal position on SB locally and internationally

Whilst the introduction of this paper provided an overview of the current laws to prosecute SB in SL, CIABOC in 2019 proposed policy suggestions for legislative amendments to expressly incorporate SB as a form of 'gratification'. They propose to define a 'sexual favour' as "sexual intercourse, or any act that

would not amount to sexual intercourse, but will amount to or constitute physical, verbal, or non-verbal conduct of a sexual nature."<sup>201</sup> This would be a drastic advancement of the current position of law on SB. The International Association of Women Judges has developed a working definition of SB.<sup>202</sup> They dissect the offence into two components, for it to involve an implicit or explicit request to engage in any kind of unwanted sexual activity, and, that the persons who demand the sexual activity must occupy a position of authority, which they abuse by seeking to exact, or by accepting, a sexual act in exchange for exercising the power entrusted to them. The abuse of authority entrusted to them for their benefit by the perpetrator, solicitation of sexual favour in exchange for a benefit that they are empowered to withhold or confer (*quid pro quo*) and the imbalance of power between the perpetrator and the victim/survivor which allows the perpetrator to exert psychological coercive pressure over the victim is identified as the elements of 'corruption'. This very nature of the offence is the reason why it is often misrepresented and misinterpreted in legal action. When prosecution of SB in international jurisdictions is studied, it can be observed that SB would neither fit in laws against sexual offences, due to the problematic stance of 'consent', nor in laws combatting bribery and corruption, since they are often restrictive to financial forms of bribes.<sup>203</sup> It must be noted that by 2019, India's Jammu and Kashmir was the only identified territory to legally criminalise SB<sup>204</sup>.

### Bribery and Corruption laws vs Sexual Offences laws - 'Consent' of the victim

As per the International Bar Association, legal frameworks addressing SB are "an imprecise fit and a patchwork of potentially applicable laws that might reach some, but not all sextortion conduct, leaving gaps that contribute to impunity."<sup>205</sup>

<sup>201</sup> 'Policy Suggestions for Proposed Legislative Amendments - Handbook 4' (2019) 38 <[https://ciaboc.gov.lk/media/attachments/2019/03/16extort\\_legal-eng.pdf](https://ciaboc.gov.lk/media/attachments/2019/03/16extort_legal-eng.pdf)> accessed 21 August 2022.

<sup>202</sup> Feigenblatt (n 1) 8.

<sup>203</sup> ibid 25.

<sup>204</sup> The Jammu and Kashmir Criminal Laws (Sexual Offences) (Amendment) 2018, Chapter II, 2. Insertion of section 354 E - Sextortion, Act No. XII of Samvat 1989; which makes it an offence for any person, 'in a

position of authority or in a fiduciary relationship to employ a physical or non-physical form of coercion to extort, request or demand sexual favours from any woman in exchange of some benefits or favours that such person is empowered to grant or withhold'.

<sup>205</sup> Sara Carnegie, 'Sextortion A Crime of Corruption and Sexual Exploitation' (2019) 5 <<https://www.ibanet.org/mediahandler?Id=E5E451C2-A883-4518-B0ED-5AAAEBCCDD5AA>> accessed 21 August 2022.

From a standpoint of bribery and corruption, the discussion of the consent of the victim is irrelevant, for two reasons: First, solicitation of a sexual bribe is in itself an abuse of power to gain undue sexual advantages by the officer in authority (*quid pro quo*), thus rendering the bribe giver's consent redundant.<sup>206</sup> Second, in the context of a financial bribe, not only the officer in authority who solicits the bribe, but also the bribe-giver who offers the money consents to this act of bribery as well. However, if the bribe-giver makes the complaint, even after such a transaction, they are protected by Section 79 of the Bribery Act - 'Person giving gratification not to be treated as accomplice'. If argued on the same premise, it is questionable how the same cannot apply to SB. Even though this is the case in SL, it is uncertain in many international jurisdictions. It is at the discretion of the court whether charges shall be pressed on the bribe-giver, which may contribute to deterring many victims from reporting.<sup>207</sup>

However, addressing SB from a sexual offences approach shall be problematic due to legal and practical reasons. These laws usually require evidence of physical force or overt refusal by the victim to establish an offence. In the context of SB, this requirement ignores the pervasive effect of coercion and dependency on the victim's choices.<sup>208</sup> Most laws on sexual offences require the prosecution to prove said assault or harassment 'by word or action'. Given on one hand the implied and covert nature of SB, and the often non-physical and psychological nature of the offence on the other, such evidence may not exist. Moreover, since the burden of proof of the lack of consent is on the prosecution, sexual bribes often being solicited in private, secluded settings, results in gathering evidence by witnesses, or proving the

non-consensual nature of the act a difficult task, thus granting impunity to the perpetrators.

### **Coerced Consent - Is the 'consent' given by the victim informed and complete?**

The imbalances and asymmetries of power between the victims and perpetrators often lead the former to be cornered and compromised not only at the scene of the crime but also during the prosecution process consequential to the use of coercion, undue influence, duress, intimidation, etc. by the latter. IAWJ uses the term 'coerced consent', to "invalidate a sextortion victim's apparent 'consent' to the sexual conduct".<sup>209</sup> The concept of 'coerced consent' can be understood as a situation where a victim believes they have no legitimate choice of accepting or rejecting solicitations of any sexual nature, in the apprehension of not receiving the service or worse, in fear of the rejection being met with humiliation and/or violence.<sup>210</sup>

Even though compared to international jurisdictions<sup>211</sup>, SL has adequate space to navigate the prosecution of SB within its bribery and corruption laws, the lack of explicit terms and regulations prevents prosecutors from effectively enforcing complementary laws<sup>212</sup> to seek complete redress for victims. Especially, with provisions such as Section 134<sup>213</sup> of the Evidence Ordinance, CIABOC claims that the main argument of the defence is that the victim consented to the solicitation and is subsequently pressing charges maliciously. Given the power asymmetry, and most often, political interferences with the victim on the part of the perpetrator, given they are public officials, proving the lack of consent or "leading on" may be a vexed process. This is especially

<sup>206</sup> Feigenblatt (n 1) 26.

<sup>207</sup> *ibid* 27.

<sup>208</sup> 'Amending Law and Policy to Address Sexual Bribery in Sri Lanka' (Centre for Equality and Justice (CEJ), Sri Lanka, 2018) 7.

<sup>209</sup> Åsa Eldén and others, 'Sextortion: Corruption and Gender-Based Violence, EBA Report 2020:06' (2020) 50 <[https://eba.se/wp-content/uploads/2020/11/Sextortion\\_webb.pdf](https://eba.se/wp-content/uploads/2020/11/Sextortion_webb.pdf)> accessed 21 August 2022.

<sup>210</sup> Sarah Gitlin, 'Sextortion Victims Are Not Guilty of Bribery | GAB | The Global Anticorruption Blog' (GAB | The Global Anticorruption Blog, 2016) <<https://globalanticorruptionblog.com/2016/07/22/sextortion-victims-are-not-guilty-of-bribery/>> accessed 9 September 2022.

<sup>211</sup> Thomas Reuters Foundation International Association of Women Judges, Marval o'farrell Mairal, 'A Comparative Study of Laws to Prosecute Corruption Involving Sexual Exploitation' <<https://www.trust.org/contentasset/raw-data/588013e6-2f99-4d54-8dd8-9a65ae2e0802/file>> accessed 21 August 2022.

<sup>212</sup> Such as the Assistance to and Protection of Victims of Crime and Witnesses Act no. 4 of 2015, Evidence Ordinance and Evidence (Special Provisions) Act no. 22 of 1995.

<sup>213</sup> Evidence Ordinance, Section 134 - Number of witnesses. No particular number of witnesses shall in any case be required for the proof of any fact.

the case in prosecuting private sector employees for SB, under laws relating to sexual offences, where, as discussed previously, the burden of proof of the lack of consent, is on the prosecution. Thus, the incorporation of the concept of 'coerced consent' into all legal provisions prosecuting SB through statutory provision shall mean that until such time laws and policies are amended to prosecute perpetrators of SB in both public and private sectors equally, the inconsistency between legal redress for victims of SB from public and private sectors shall be addressed.

## CONCLUSION

Awareness raising, capacity building and educating both public and institutions is an essential step to addressing the societal and cultural dilemmas centred around SB. Adopting the proposed definition, by CIABOC, of SB as a form of gratification will incorporate SB under the Bribery Act, however, it will create a conflict with sections 19 and 25, themselves as to the definition of the perpetrators identified in the two: "persons in power or authority" in the former vs "public servants" in the latter. It is indispensable to identify SB as a form of bribery, rather than a mere sexual offence. Thus, allowing SB in the private sector to be prosecuted under the Penal Code is a misrepresentation of the offence as it undermines the gravity of the offence and limits the ability and scope of SB to be prosecuted. Imparting the concept of 'coerced consent' shall not only widen but also nourish the purview of SB in its entirety.

## REFERENCES

### Statutes and Statutory instruments

Bribery Act no. 2 of 1965  
 Constitution of Sri Lanka  
 Establishments Code  
 Evidence (Special Provisions) Act no. 22 of 1995  
 Evidence Ordinance  
 Penal Code Ordinance No. 2 of 1883  
 The Assistance to and Protection of Victims of Crime and Witnesses Act no. 4 of 2015

### Cases

Kathubdeen V. Republic of Sri Lanka (1998) 3 SLR 107

### Reports and Websites

'Amending Law and Policy to Address Sexual Bribery in Sri Lanka' (Centre for Equality and Justice (CEJ), Sri Lanka, 2018)  
 Carnegie S, 'Sextortion A Crime of Corruption and Sexual Exploitation' (2019) <<https://www.ibanet.org/MediaHandler?id=E5E451C2-A883-4518-B0ED-5AAAEBBCDD5AA>> accessed 21 August 2022  
 Eldén Å and others, 'Sextortion: Corruption and Gender-Based Violence, EBA Report 2020:06' (2020) <[https://eba.se/wp-content/uploads/2020/11/Sextortion\\_web\\_b.pdf](https://eba.se/wp-content/uploads/2020/11/Sextortion_web_b.pdf)> accessed 21 August 2022  
 Feigenblatt H, 'Breaking the Silence around Sextortion: The Links between Power, Sex and Corruption' (2020) <[https://images.transparencycdn.org/images/2020\\_Report\\_BreakingSilenceAroundSextortion\\_English.pdf](https://images.transparencycdn.org/images/2020_Report_BreakingSilenceAroundSextortion_English.pdf)> accessed 21 August 2022  
 Gitlin S, 'Sextortion Victims Are Not Guilty of Bribery | GAB | The Global Anticorruption Blog' (GAB | The Global Anticorruption Blog, 2016) <<https://globalanticorruptionblog.com/2016/07/22/sextortion-victims-are-not-guilty-of-bribery/>> accessed 9 September 2022  
 Hendry N, 'Sextortion: Sexual Offence or Corruption Offence?' (*Transparency International*, 2020) <<https://www.transparency.org/en/blog/sextortion-sexual-offence-or-corruption-offence>> accessed 21 August 2022  
 International Association of Women Judges, Marval O'farrell Mairal TRF, 'A COMPARATIVE STUDY OF LAWS TO PROSECUTE CORRUPTION INVOLVING SEXUAL EXPLOITATION' <<https://www.trust.org/contentAsset/raw-data/588013e6-2f99-4d54-8dd8-9a65ae2e0802/file>> accessed 21 August 2022  
 'Policy Suggestions for Proposed Legislative Amendments - Handbook 4' (2019) <<https://ciaboc.gov.lk/media/attachments/2019/03/16/4-legal-eng.pdf>> accessed 21 August 2022  
 'Sexual Bribery: The Silenced Side of Corruption' *Daily FT, Wijeya Newspapers Ltd* (2020) <<https://www.ft.lk/Opinion-and-Issues/Sexual-bribery-The-silenced-side-of-corruption/14-705482>> accessed 21 August 2022

Radin M, 'Statutory Interpretation' (1930) 43  
Harvard Law Review 863  
<<https://www.jstor.org/stable/1330769?origin=crossref>> accessed 8 September 2022  
UN. Committee on the Elimination of  
Discrimination against Women (66th sess. :  
2017 : Geneva), 'Concluding Observations

on the 8th Periodic Report of Sri Lanka :  
Committee on the Elimination of  
Discrimination against Women' (UN, 2017)  
<<https://digitallibrary.un.org/record/1286137?ln=en#record-files-collapse-header>>  
accessed 21 August 2022



## Protection Status of Geographical Indications (GIs) in Agricultural Sector of Sri Lanka Compared to Other Developing Countries : Special Emphasis on India and Vietnam

Uttara Kaumadi Wijesuriya\*<sup>1</sup>

<sup>1</sup>Faculty of Law, General Sir John Kotelawala Defence University

### ARTICLE INFO

#### Article History:

Received Date: 01 July 2022

Accepted Date: 15 September 2022

#### Keywords:

Agricultural Sector; Developing Countries;  
Geographical Indications; Sui Generis System

#### Citation:

Uttara Kaumadi Wijesuriya. (2022). *Protection Status of Geographical Indications (GIs) in Agricultural Sector of Sri Lanka Compared to Other Developing Countries: Special Emphasis on India and Vietnam*. Proceedings of SLIIT International Conference on Advancements in Sciences and Humanities, (11) October, Colombo, 140 - 144.

### ABSTRACT

As a country of agricultural origin in the developing world, Sri Lanka has not adequately focused on the protection of Geographical Indications (GIs) to gain substantial economic returns. Presently, "Ceylon Tea" and "Ceylon Cinnamon" are protected under the Sri Lankan GI regime. India and Vietnam, although in the developing world, have gained considerable success in GI protection and therefore many lessons can be learned from them. The doctrinal and comparative research methodologies were adopted in this study using primary and secondary sources, to compare the GI systems with India and Vietnam. Recently, Sri Lanka has introduced a registration procedure under the sui generis system by an amendment to the Intellectual property (IP) Act. Yet, the efficiency can only be seen in the future, as this mechanism was only enforced from the 16th of March 2022. The same registration procedure is followed by India for a considerable period, and they have been successful in achieving agricultural development through proper enforcement. As per the Vietnamese system, it is necessary to increase the level of awareness in promoting GIs by training national experts, funding technical assistance and providing funds for implementation. They highlight adequate government interventions are necessary for the protection mechanism to be effective which Sri Lanka should look into in greater detail. The main reasons for the slow progress in obtaining protection for potential products are inadequate Government

\* Uttara, utwij98@mail.com

interventions and the recently introduced registration system being too new to assess the progress, as it takes time for the results to be seen.

## INTRODUCTION

Geographical Indications (GIs) are instruments in Intellectual Property Law and many countries have adopted GIs to protect their goods to achieve economic development. It is, however, more important for developing countries, which rely mainly on the agricultural sector. However, it is in fact they who face difficulties in protecting GIs for their agricultural products, compared to developed countries.<sup>214</sup>

The TRIPS Agreement is the standard concerning GIs, subscribed by all members of the World Trade Organization (WTO).<sup>215</sup> TRIPS defines GIs in article 22.1 as, "Indications which identify a good as originating in the territory, where the quality, reputation or other characteristics are essentially attributable to its geographical origin".<sup>216</sup> GIs are differentiated from other products due to their distinguishing qualities based on local geological factors, viz. soil and climate, and human factors such as traditional manufacturing techniques, specific to locations.<sup>217</sup>

Sri Lanka has great potential to protect its agricultural products through GIs. However, there appears slow progress in the adoption of GIs. Developing countries such as India and Vietnam have gained agricultural development through proper GI systems. This article is therefore focused on examining the Sri Lankan situation of GI protection in the agricultural sector and suggesting ways to improve the system through important lessons Sri Lanka should learn from India and Vietnam.

## METHODOLOGY

This study employed doctrinal and comparative international research methodologies. Accordingly, primary sources such as legislation and secondary sources such as e-books, journals, websites, reports and theses were referred to. Since this is a comparative study between Sri Lanka and two other developing countries; India and Vietnam, with special emphasis on GI protection in the agricultural sector, a comparison of protection systems was carried out.

## RESULTS AND DISCUSSION

### *Benefits of Adopting GI Protection for Agricultural Products in Developing Countries*

GI protection for agricultural products in developing countries would aid in market differentiation and setting up a premium price for the protected goods. Consumers could identify a good's quality through GIs. All of these can increase market power in the international arena, whilst ensuring environmental sustainability and rural development.<sup>218</sup> Since GI-protected goods have distinguishing qualities from other commodity products, the agricultural producers in developing countries could secure their market access, whilst competing with industrialized countries. GIs create a competitive advantage for small producers and has become an efficient mode for aggregating their market power. Indian Basmati rice and Darjeeling tea, Indonesian Kintamani Bali coffee and Muntok white pepper, Vietnamese Buon ma Thuot coffee and Me'o vac mint honey, Jasmine rice and Surin hom mali scented rice from Thailand are some examples in this regard.<sup>219</sup>

Modern-day consumers believe GIs are tools to identify quality products. They even tend to pay a premium price for such products in terms of food safety.<sup>220</sup> In China, the prices of Zhanyqiu scallion and Jianlian lotus seed were raised after registering them as certification marks.<sup>221</sup> Securing premium prices for Indian

<sup>214</sup> Naazima Kamardeen, 'Geographical Indications at the Crossroads of Trade, Development, and Culture' (Cambridge University Press, 2017) <<https://www.cambridge.org/core/books/geographical-indications-at-the-crossroads-of-trade-development-and-culture/potentials-and-current-challenges-of-protecting-geographical-indications-in-sri-lanka>> 22 April 2022.

<sup>2</sup> Naazima (n 1).

<sup>216</sup> 'WTO | Intellectual Property – Overview of TRIPS Agreement' (Wto.org, 2019) <[https://www.wto.org/English/tratop\\_e/trips\\_e/intel2\\_e.htm](https://www.wto.org/English/tratop_e/trips_e/intel2_e.htm)> 22 April 2022.

<sup>217</sup> Lihini De Silva, 'Geographical Indications- Need of a Registration System for Sri Lanka' (*lr.kdu.ac.lk*, 2015) <<http://lr.kdu.ac.lk/bitstream/handle/345/1360/law-009.pdf?sequence=1&isAllowed=y>> 20 April 2022.

<sup>218</sup> Blakeney M, 'The Role of Geographical Indications in Agricultural Sustainability and Economic Development' *Ann Agric Crop Sci.* 2021; 6(1): 1069.

<sup>219</sup> *ibid* 1070.

<sup>220</sup> Michael (n 6) 1070.

<sup>221</sup> Michael (n 6) 1070.



Basmati and Thai Jasmine rice were seen as an encouragement for attracting external investments, too.<sup>222</sup> The policies regarding GIs are made on par with environmental sustainability concerns in many countries and South Africa's Rooibos tea industry is an example in this respect.<sup>223</sup> GIs aid rural development and create jobs from farmer to trader, increase household income, develop infrastructure and minimize labour migration. A new approach, agro-tourism has stimulated the prices of lands in rural areas and attracted potential investors.<sup>224</sup> The inherent characteristics in developing countries like limited market knowledge, technology and financial resources to promote their products, and difficulties in accessing international markets while competing with developed countries can be resolved to a certain extent through GI protection.

#### ***Sri Lankan Situation of GI Protection in the Agricultural Sector***

Sri Lanka has GI protection for two agricultural products, viz. "Ceylon Tea" and "Ceylon Cinnamon". "Ruhunu Curd",<sup>225</sup> "Ceylon Peper" and "Ceylon Cashew" are some other potential products that should be looked into.<sup>226</sup> The already protected "Ceylon Tea" and "Ceylon Cinnamon" have issues in their protection systems.<sup>227</sup> Although these products have boosted potential in gaining socio-economic development, the promotion of these products in an effective manner is necessary to reap the real benefits. These are currently registered under trademark registration. Recently, the amendment made to IP Act introduced a comprehensive procedure to be followed under the *sui generis* GI registration as per sections 161A to 161M.<sup>228</sup> In

the absence of proper national registration under the *sui generis* system in the past, Sri Lankan GIs have often been abused internationally. For instance, the inability to register Ceylon tea in the USA has caused issues in product differentiation resulting in negative impacts on Ceylon tea.<sup>229</sup> A national registry was established by the 2018 amendment to the IP Act and it conferred the power to the Minister to prescribe GIs for potential products.<sup>230</sup> However, the modalities on how a GI should be prescribed, the criteria of selection and the application procedure were not described in it. Thus, it is necessary to follow the new registration system properly to achieve increased export earnings, especially from Europe where Sri Lankan products are preferred.<sup>231</sup> Sri Lanka Tea Board had attempted to register Ceylon Tea as a GI from the year 2003 with the enactment of the IP Act in the same year. They could only achieve this in 2010, after registering Ceylon Tea as a certification mark under trademark registration.<sup>232</sup> The long history of Ceylon Cinnamon with unique manual processing techniques to make cinnamon quills is very important since 97% of true cinnamon is exported by Sri Lanka.<sup>233</sup> However, Ceylon Cinnamon was registered as a certification mark in 2013. It could register in European Union in 2022 with the efforts made by the Export Development Board, marking the first ever internationally registered GI for Sri Lanka.<sup>234</sup>

If a GI is registered as a collective or certification mark, it would only provide a sign to distinguish goods or services of different enterprises as a private right.<sup>235</sup> Rather, if a GI is registered under the new registration mechanism, it would provide for both private and public property rights and would be a good

<sup>222</sup> *ibid* 1070 – 1071.

<sup>223</sup> *ibid* 1072.

<sup>224</sup> *ibid* 1072.

<sup>225</sup> *Naazima* (n 1).

<sup>226</sup> Intellectual Property (Amendment) Act No. 8 Of 2022 Comes into Effect from Today' (*Times Online*, 2022) <<https://www.timesonline.lk/news-online/Intellectual-Property-Amendment-Act-No-8-of-2022-comes-into-effect-from-today/2-1137094>> 10 August 2022.

<sup>227</sup> *Lihini* (n 4) 43.

<sup>228</sup> The Intellectual Property (Amendment) Act, No. 8 of 2022.

<sup>229</sup> Dilani Hirimuthugodage and Piyumi Rasangi, 'Talkingeconomics - Geographical Indications (Gis) for Sri Lankan Products: The Need to Expand Local Registration' (*Ips.lk*, 2022) <<https://www.ips.lk/talkingeconomics/2022/03/07/geogra> 2022.

phical-indications-gis-for-sri-lankan-products-the-need-to-expand-local-registration/> 20 April 2022.

<sup>230</sup> The Intellectual Property (Amendment) Act, No. 7 of 2018.

<sup>231</sup> *Lihini* (n 4) 45.

<sup>232</sup> *Naazima* (n 1).

<sup>233</sup> *Naazima* (n 1).

<sup>234</sup> 'Sri Lanka's Inaugural Protected Geographical Indication (PGI) for Ceylon Cinnamon - Everything You Need to Know' (*Srilankabusiness.com*, 2022)

<<https://www.srilankabusiness.com/news/sri-lankas-inaugural-protected-geographical-indication-for-ceylon-cinnamon--everything-you-need-to-know.html>> 16 April 2022.

<sup>235</sup> 'National Intellectual Property Office (NIPO)' (*Nipo.gov.lk*) <<https://www.nipo.gov.lk/web/index.php?lang=en>> 8 August

indicator for the traders and consumers, that a product is originating from a certain country or a county's geographical location. Registered certification marks need annual renewals,<sup>236</sup> yet registered GIs under the new system need renewals after 10 years from registration.<sup>237</sup> Thus, if Ceylon Cinnamon and Ceylon Tea are registered under *sui generis* system, the existing issues with them can be resolved to a certain extent. Section 161M of the amendment states, GIs already registered as certification marks can be registered under the new system as per section 161B.<sup>238</sup> Thus, the relevant authorities must take steps to encourage producers of other unique products to protect them effectively through this special GI registration.<sup>239</sup>

### **Comparison with Indian and Vietnamese GI registration systems**

Before the enactment of the Geographical Indication of Goods Act of 1999, India's agricultural products such as Basmati rice and Darjeeling tea were abused in international markets. Later, a registration system for GIs was established under the Act.<sup>240</sup> Accordingly, authorized GI users can register their products in WTO countries and able to gain legal protection under GI registration. It was reported that the post-registration situation in India has shown positive results, where both the product demand and the revenue have been increased by 33%.<sup>241</sup> There is proven success in the Indian context after adopting and following a GI registration mechanism, which Sri Lanka has recently adopted.

A legal framework was first set up in 1995 in Vietnam for GI protection and from 1995 to 2005 a series of laws, circulars and decrees were introduced. The terms "GI" and "Appellations of Origin" were first protected under the Civil Code of 1995.<sup>242</sup> Before joining WTO, they revised the GI regulations and granted protection for agricultural products. Their IP Law was effective in accelerating GI registrations. When compared to Sri Lanka, Vietnam adopted a variety of ways to protect

GIs from the initial stages and gradually progressed to have a steady framework. In contrast, Sri Lanka only provided GI protection through IP Act under trademark law, unfair competition and undisclosed information and few statutes such as Consumer Protection Law and False Trade Descriptions Law until the new amendment came into force on the 16<sup>th</sup> of March 2022.<sup>243</sup> The lack of sufficient legislative laws is the reason for the current pitiful status incurred for Ceylon tea.<sup>244</sup> The Vietnam Government promotes GIs by training GI experts, funding for technical assistance and implementation and enhancing local level awareness.<sup>245</sup> After the establishment of the registration system in Vietnam, the regulatory mechanisms became clearer due to decentralized power regulation between the central government and local authorities. The province leaders have set an effective strategy to coordinate the production process, viz. breeding, fertilizing, pest control and post-harvest conservation. The Vietnamese GI system has registered 74 protected GIs for fruits, vegetables, spices, aromatic rice and coffee, making Vietnam a successful country among ASEAN countries.<sup>246</sup> Therefore, the Government and respective authorities of Sri Lanka must essentially look into the newly implemented registration system to enforce it efficiently to protect the registered and potential products, whilst forming proper monitoring and controlling bodies that should work jointly to expect positive outcomes from this new mechanism in the near future.

### **CONCLUSION**

Sri Lanka's neighbour – India, being a developing country that relies on agriculture for economic development, is a definite positive influence on Sri Lanka to effectively enforce the newly adopted GI registration. However, the recently adopted system in Sri Lanka is too new to be assessed for its efficiency and outcomes. At the same time, clear Vietnamese regulatory

<sup>236</sup> 'Sri Lanka's Inaugural... (n 22).

<sup>237</sup> The Intellectual Property (Amendment) Act, No. 8 of 2022, s 161E.

<sup>238</sup> The Intellectual Property (Amendment) Act, No. 8 of 2022, s 161M.

<sup>239</sup> 'Sri Lanka's Inaugural... (n 22).

<sup>240</sup> *Lihini* (n 4) 45.

<sup>241</sup> *Lihini* (n 4) 45.

<sup>242</sup> Giang Hoang and Thuy T. Nguyen, 'Geographical Indications and Quality Promotion of Agricultural Products in

Vietnam: An Analysis of Government Roles' (2020) 30

Development in Practice

<<https://www.tandfonline.com/doi/abs/10.1080/09614524.2020.1729344?journalCode=cdip20>> 10 April 2022.

<sup>243</sup> *Naazima* (n 1).

<sup>244</sup> *Lihini* (n 4) 43.

<sup>245</sup> *Giang* (n 30) 515.

<sup>246</sup> *ibid* 515.

mechanisms and decentralized power between the central government and local authorities, enhancing awareness in promoting GIs and funding for technical assistance are great lessons for Sri Lanka to learn. Hence, adequate government interventions and appropriate policies on legal, technical, social and environmental aspects for enforcing the new registration system through a collective involvement of respective authorities are needed to reach the successful status in GI protection in the agricultural sector of Sri Lanka.

## REFERENCES

1. Blakeney M, 'The Role of Geographical Indications in Agricultural Sustainability and Economic Development' (2021) 6 *Annals of Agricultural & Crop Sciences*; 6(1): 1069
2. De Silva L, 'Geographical Indications- Need of A Registration System for Sri Lanka' (*Ir.kdu.ac.lk*, 2015)
3. Geographical Indications of Goods (Registration and Protection) Act of 1999
4. Hirimuthugodage D, and Rasangi P, 'Talkingeconomics - Geographical Indications (Gis) for Sri Lankan Products: The Need to Expand Local Registration' (*ips.lk*, 2022) <<https://www.ips.lk/talkingeconomics/2022/03/07/geographical-indications-gis-for-sri-lankan-products-the-need-to-expand-local-registration/>> 20 April 2022
5. Hoang G, and Nguyen T, 'Geographical Indications and Quality Promotion of Agricultural Products in Vietnam: An Analysis of Government Roles' (2020) *Development in Practice* <<https://www.tandfonline.com/doi/abs/10.1080/09614524.2020.1729344?journalCode=cdip20>> 10 April 2022
6. 'Intellectual Property (Amendment) Act No. 8 Of 2022 Comes into Effect from Today' (*Times Online*, 2022) <<https://www.timesonline.lk/news-online/Intellectual-Property-Amendment-Act-No-8-of-2022-comes-into-effect-from-today/2-1137094>> 10 August 2022
7. Kamardeen N, *Geographical Indications at The Crossroads of Trade, Development, and Culture* (Cambridge University Press 2017) <<https://www.cambridge.org/core/books/geographical-indications-at-the-crossroads-of-trade-development-and-culture/potentials-and-current-challenges-of-protecting-geographical-indications-in-sri-lanka>> 22 April 2022
8. 'National Intellectual Property Office (NIPO)' (*Nipo.gov.lk*) <<https://www.nipo.gov.lk/web/index.php?lang=en>> 8 August 2022
9. Sri Lanka's Inaugural Protected Geographical Indication (PGI) for Ceylon Cinnamon - Everything You Need to Know' (*Srilankabusiness.com*, 2022) <<https://www.srilankabusiness.com/news/sri-lankas-inaugural-protected-geographical-indication-for-ceylon-cinnamon--everything-you-need-to-know.html>> 16 April 2022
10. The Intellectual Property (Amendment) Act, No. 7 of 2018
11. The Intellectual Property (Amendment) Act, No. 8 of 2022
12. 'WTO | Intellectual Property – Overview of TRIPS Agreement' (*Wto.org*, 2019) <[https://www.wto.org/English/tratop\\_e/trips\\_e/intel2\\_e.htm](https://www.wto.org/English/tratop_e/trips_e/intel2_e.htm)>



## Forging Ahead with Attitudinal Changes towards an Efficient Practice of Commercial Arbitration in Sri Lanka

\*<sup>1</sup>K.G.T Dilhara (attorney-at-law)

### ARTICLE INFO

#### Article History:

Received Date: 01 July 2022

Accepted Date: 15 September 2022

#### Keywords:

Commercial arbitration; Alternative Dispute Resolution; speedy resolution of disputes; attitudinal shift.

#### Citation:

K.G.T Dilhara. (2022). *Forging Ahead with Attitudinal Changes towards an Efficient Practice of Commercial Arbitration in Sri Lanka*. Proceedings of SLIIT International Conference on Advancements in Sciences and Humanities, (11) October, Colombo, 145 - 149.

### ABSTRACT

This study examines the question, of whether the pervading disappointment surrounding the practice of commercial arbitration in Sri Lanka, is due to the assimilation of court practices into commercial arbitration by the legal practitioners. Arbitration as an Alternative Dispute Resolution (ADR) method to judicial processes was introduced with the enactment of Arbitration Act No.11 of 1995 and hailed as an effective ADR for the resolution of commercial disputes. Participants were ten senior legal practitioners involved in both court practice as well as commercial arbitration for more than ten years in Sri Lanka. The study used a phenomenological research design to explore the perspectives of ten participants. It was hypothesised that the legal practitioners involved in both court and commercial arbitration practice would have a deeper understanding of the disappointments surrounding commercial arbitration practice and why commercial arbitration has not yielded the anticipated result of efficiency in dispute resolution over court practice. The results indicated that the same practitioners in court and arbitration, bring the same attitudes and skill set practised in courts into commercial arbitration. Thus, the emerging theme is to create an attitudinal shift in the participants of commercial arbitration for the speedy resolution of disputes in comparison to formal court practice.

\* Dilhara, thilani746@gmail.com

## INTRODUCTION

In a formal adjudicatory process, the disputants assume opposing positions to either enforce or defend a legal right in a court of law presided over by a judge, who gives a final verdict based on evidence and procedure prescribed by law<sup>247</sup>. There is an escalating frustration that prevails over the court system as an effective means of dispute resolution and this is due to many reasons. Amongst which, long delays in dispute resolution arise not only due to a heavy backlog of cases but also due to a culture of postponement of court hearings on personal grounds<sup>248</sup>.

Arbitration as an Alternative Dispute Resolution ("ADR") is a means by which disputes can be resolved, pursuant to the parties' agreement by independent non-governmental decision makers<sup>249</sup>. The defining characteristics of commercial arbitration are that, the parties consent to refer a dispute for arbitration, arbitrators are private persons, arbitration produces a binding award and finally, arbitration is flexible when compared to most court procedures.<sup>250</sup> Flexibility inherent in the arbitration practices is one of the significant factors that would lead to a speedy resolution of disputes of both local as well as international arbitration as the parties are allowed to agree upon procedural rules that are tailor-made to their cases. Arbitration could be either *ad hoc* or institutional arbitration<sup>251</sup>. Several organisations have been established around the globe as well as in Sri Lanka to provide institutional arbitration services by the promulgation of procedural rules. Such procedural rules may govern matters such as the appointment of arbitrators, rules of evidence, pleading rules, right of lawyers to appear, the conduct of hearings etc. In such a context, the party autonomy allows the parties to decide on the best means for resolution of a dispute, unlike the strict court procedures on pleadings, and adducing evidence, the research questions are administered to the participants.

## MATERIALS AND METHODS

A purposeful sampling technique was used to identify the legal practitioners currently in practice in the District of Colombo acting as both lawyers in formal courts and either as arbitrators or legal counsel for parties who have chosen arbitration as an ADR mechanism. A final sample of ten individuals was included in the study to facilitate a deeper exploration of their views on the research question as Qualitative research provides a method for researchers to learn about a phenomenon that has little research by exploring the experiences of people in their natural environment rather than confirming or denying a preconceived theory (Powell, P.W, 2013).

The professionals participated in a semi-structured interview via telephone and e-mail. Data collection followed by data analysis led by an inductive approach enabled the identification of the main issues from the perspective of participants. Several key issues of arbitration as seen through the lens of experienced and talented legal practitioners who not only understand the formalities of court practice but the inherent flexibility of arbitration procedures have expressed their frustrations over the results produced in commercial arbitration.

## RESULTS AND DISCUSSION

The main theme that runs in the study is the adoption of similar practices of courts, in arbitration proceedings by the same practitioners who simultaneously participate in court proceedings as well as in arbitration. The underlying theme that emerged was that the mindset of these practitioners does not change when they shift from formal litigation to commercial arbitration.

All participants reported the recurring theme, that arbitration has assimilated court procedure, where 'procedures now typically include a lot of excess baggage in the form of motions, briefs, discovery, depositions, judges,

---

<sup>247</sup> Wickrema Weerasooriya, *A Text Book of Commercial Law* (PIM 2010) 694

<sup>248</sup> K Kang-Iswaran, 'Arbitration-Why it has not worked? A Comment on the operation of the Arbitration Act' (2016). LawNet Ministry of Justice. <https://www.lawnet.gov.lk/arbitration-why-has-it-not-worked-a-comment-on-the-operation-of-the-arbitration-act/>

<sup>249</sup> Borne G, *International Commercial Arbitration* (Kluwer Law International 2001) 1

<sup>250</sup> Borne G, *International Commercial Arbitration* (Kluwer Law International 2001) 1

<sup>251</sup> Borne G, *International Commercial Arbitration* (Kluwer Law International) 13

lawyers, court reporters, expert witnesses, publicity, and damage awards beyond reason' with emphasis on 'legal and procedural technicalities', thus paying scant attention to the spirit of arbitration<sup>252</sup>.

A participant who often sits as arbitrator observes that delays in the decision of the arbitral tribunal are often in situations where dates are applied for on personal and other grounds, motions are filed requesting that a sitting be not held due to the unavailability of witnesses etc. Considering that, unlike the judicial system, the disputants are paying for the venue and also the arbitrator/judge, in addition to meeting their own lawyers' fees, it has become very burdensome to parties. A similar observation of a legal counsel representing clients in arbitration forums was that arbitration practices in Sri Lanka have become ineffective in serving the purpose it was created for, speedy resolution of disputes. Further, it has been pointed out that lawyers and the adjudicators appointed as arbitrators have become the cause of delays as arbitration hearings take place according to the diaries of legal counsels, very much like in a court of law.

Hence, analysing the above viewpoints, a recurring theme that comes to light regarding the overall attitude towards the conduct of arbitration of the arbitrators, counsels as well as users of arbitration. The fact that arbitration in Sri Lanka is dominated by lawyers and retired judges has invariably resulted in undue delays in proceedings due to the busy schedules of these practitioners. For instance, arbitral sittings are fleeting; commencing after court work, starting around 3 or 4 pm, because the counsels appearing are busy practitioners and prefer to adjourn early to get ready for the next day's court work. Postponements are readily granted, necessitating a greater number of sittings<sup>253</sup>. All such unethical practices of the arbitrators and counsels have created roadblocks to a speedy resolution of disputes by arbitration, which has resulted in a sense of frustration in the disputants who have begun to circumvent arbitration and instead, resort to regular courts. Further, Court Intervention has

contributed to such a trend, which is beyond the scope of this study and has been covered elsewhere.

It is undisputed that speed should be the quintessence in the adjudication of commercial disputes. Therefore, several recommendations are made as a solution to the problems highlighted in this paper which calls for an attitudinal change in those involved in arbitration practice.

First and foremost, it is recommended that, if any legal practitioner chooses to act, either as an arbitrator or counsel and is appointed by disputants to act so, such appointment be accepted subject to their commitment to adhere to the agreed timelines of the disputants. In this regard, end users (disputants) should be empowered by raising awareness of their freedom to fix time limits and other flexible procedures for a speedy resolution of disputes, independent of the busy schedules of legal practitioners. Hence, end-users of arbitration should be made aware of their rights and entitlements implemented through their chosen arbitrators and counsels for an increased speed in the resolution of disputes. Further, to meet such objectives, institutional rules should be updated, together with a binding code of ethics applicable to arbitrators and legal counsels. Institutional rules could be conveniently updated, enabling day-to-day hearings and sittings to be held for at least eight hours each day (eg. 9 a.m. to 1 and 2 to 5 p.m.), to establish a mechanism to receive each day's proceedings the very same evening, so that counsel can prepare for the next day (in case of day-to-day hearings), as it happens in the international arbitrations held in U.A.E. or Singapore. Further, imposing maximum periods (such as two weeks) for arbitral awards to be made by arbitrators would avert inordinate delays after the hearings have concluded.

If one were to argue that an attitudinal change in the stakeholders of arbitration is futile without statutory reform to support the same, it is recommended to introduce necessary changes to the justice system, to create a species of lawyers together with

---

<sup>252</sup> Thejaka Perera, 'Evolving to Resolve: Is Arbitration a facilitator or a disruptor in speedy conflict resolution' (2019) Association of Professional Bankers Sri Lanka

<sup>253</sup> K Kang-Iswaran, 'Arbitration-Why it has not worked? A Comment on the operation of the Arbitration Act' (2016) LawNet Ministry of Justice. <https://www.lawnet.gov.lk/arbitration-why-has-it-not-worked-a-comment-on-the-operation-of-the-arbitration-act/>

required training for necessary skills<sup>254</sup> with the knowledge of information technology (Perera, T, 2019) to become dedicated arbitrators and legal counsels without the burden of court work. This would create a novel and vibrant culture of arbitration, geared towards not only speedy resolution of domestic disputes but also creating a platform for a regional arbitration venue for the resolution of international commercial disputes that caters to the demands of modern times triggered by international trade.

## CONCLUSION

This study explored the phenomenon of commercial arbitration in Sri Lanka and why it has not achieved the purpose for which it was established. One implication was that the composition of arbitrators and counsels consisted of the same professionals involved in the adjudication system. Hence, it is recommended that be it institutional arbitration or ad hoc arbitration to train arbitrators and counsels exclusively dedicated to arbitration practice. To bring about this change, an attitudinal shift towards an arbitration-friendly culture in the stakeholders together with law reform is necessary.

Furthermore, awareness is to be created among the users of commercial arbitration to decide on the time limits and flexibility in arbitration proceedings that would enable arbitrators to conduct the proceedings efficiently with the support of all participants and grant a final award expeditiously. To support such sustainable changes to the justice system, an attitudinal change would be mandatory, supported by a binding code of ethics for arbitrators and counsels.

Future research related to this study may provide a more in-depth understanding of successful practices in other jurisdictions that could be adopted not only to make domestic commercial arbitration much faster, efficient and cost-effective but also to make arbitration in Sri Lanka more conducive to the resolution of international commercial disputes. The objective is to find out what successful practices have been applied by international commercial arbitration centres around the world and their

suitability and applicability to Sri Lankan Commercial Arbitration Centres.

In conclusion, arbitration, as a form of ADR is considered to be more effective and congenial for the resolution of commercial disputes owing to it being a private process for disputants to find a legal remedy more flexibly and expeditiously. In comparison to other forms of ADR, arbitration is preferred as the arbitrator or the arbitral tribunal could give an award that is binding on the parties and enforceable in a court of law.

## ACKNOWLEDGEMENT

I would like to extend my heartfelt gratitude to the Head of Law School; Professor N.Selvakumaran, Assistant Professor; Dr Kushanthi Harasgama and Lecturer; Ms Samurdhi Jayamaha for the extensive personal and professional guidance extended to me.

I am ever grateful to the eminent lawyers of the Bar Association of Sri Lanka, whom I had the privilege of interviewing personally for the insightful comments and expertise offered to me for this study, with innumerable ways for improvement.

## REFERENCES

- Arbitration Act No.11 of 1995, Sri Lanka  
Arbitration Rules of International Chamber of Commerce (ICC)  
<https://iccwbo.org/dispute-resolution-services/arbitration/rules-of-arbitration/>
- Born, G., International Commercial Arbitration (Kluwer International Law, 2nd edn 2001)
- 'Building a Career in Arbitration and Alternative Dispute Resolution' (Webinar of the Bar Association of Sri Lanka, 2020).  
<[https://www.youtube.com/watch?v=TKt\\_YGI\\_EaQ](https://www.youtube.com/watch?v=TKt_YGI_EaQ)> accessed 15 July 2022
- Butler, P., Prasad, D. A Study of International Commercial Arbitration in the Commonwealth. *Commonwealth Secretariat*. (2020) <[https://production-new-commonwealth-files.s3.eu-west-2.amazonaws.com/migrated/key\\_reform\\_pdfs/A%2BStudy%2Bof%2BInternational%](https://production-new-commonwealth-files.s3.eu-west-2.amazonaws.com/migrated/key_reform_pdfs/A%2BStudy%2Bof%2BInternational%2Bnot-worked-a-comment-on-the-operation-of-the-arbitration-act/)

<sup>254</sup> K Kang-Iswaran, 'Arbitration-Why it has not worked? A Comment on the operation of the Arbitration Act' (2016) LawNet Ministry of Justice. [https://www.lawnet.gov.lk/arbitration-why-has-it-](https://www.lawnet.gov.lk/arbitration-why-has-it-not-worked-a-comment-on-the-operation-of-the-arbitration-act/)

[not-worked-a-comment-on-the-operation-of-the-arbitration-act/](https://www.lawnet.gov.lk/arbitration-why-has-it-not-worked-a-comment-on-the-operation-of-the-arbitration-act/)



[2BCommercial%2BArbitration PDF - compressed.pdf](#)> accessed 15 July 2022

Institute for the Development of Commercial Law and Practice (ICLP)

<<http://www.iclp.lk>> accessed 15 July 2022

Kang-Iswaran, K. Arbitration-Why it has not worked? A Comment on the operation of the Arbitration Act. (2016) *LawNet Ministry of Justice*.

<<https://www.lawnet.gov.lk/arbitration-why-has-it-not-worked-a-comment-on-the-operation-of-the-arbitration-act/>> accessed 15 July 2022

Kinga, T 'The Legal Relationship between the Parties and the Arbitral Institution' (ELTE Law Journal, 2013) (1) 103-122)

<<https://eltelawjournal.hu/the-legal-relationship-between-the-parties-and-the-arbitral-institution/>> accessed 15 July 2022

Perera, T, 'Evolving to Resolve: Is Arbitration a facilitator or a disruptor in speedy conflict resolution. (*Association of Professional Bankers Sri Lanka*, 2019)

<[https://apbsrilanka.com/wp-content/uploads/2021/01/2019\\_31st\\_con\\_v\\_a\\_14\\_Thejaka\\_Perera.pdf](https://apbsrilanka.com/wp-content/uploads/2021/01/2019_31st_con_v_a_14_Thejaka_Perera.pdf)> accessed 15 July 2022

Powell, P.W. 'Connecting with Others; A Qualitative Research Study of Online Social

Networking Site Usage' (The Practitioner Scholar: Journal of Counselling and Professional Psychology, Vol 2 2013)

Sri Lanka National Arbitration Centre

<<http://www.slnarbcentre.com> > accessed 15 July 2022

Singapore International Arbitration Centre

<<https://www.siac.org.sg> > accessed 15 July 2022

The London Court of International Arbitration.

<<https://www.lcia.org>> accessed 15 July 2022

The Convention on the Recognition and Enforcement of Foreign Arbitral Awards

<<https://www.newyorkconvention.org>> accessed 15 July 2022

UNCITRAL Model Law on Commercial International Arbitration

<[https://uncitral.un.org/sites/uncitral.un.org/files/media-documents/uncitral/en/06-54671\\_ebook.pdf](https://uncitral.un.org/sites/uncitral.un.org/files/media-documents/uncitral/en/06-54671_ebook.pdf)> accessed 15 July 2022

Weerasooriya, W., A Text Book of Commercial Law. (The Postgraduate Institute of Management, 2010)

WIPO Arbitration and Mediation Centre

<<https://www.wipo.int/amc/en/>> accessed 15 July 2022

Hongkong International Arbitration Centre

<<https://www.hkiac.org>> accessed 15 July 2022





## Mediation and the Myth of Enforceability

W A Saranee Wasana Gunathilaka<sup>1</sup>, Samurdhi Jayamaha<sup>\*2</sup>

<sup>1</sup>Attorney at Law,

<sup>2</sup>School of Law, Faculty of Humanities and Sciences, SLIIT, Malabe, Sri Lanka,

### ARTICLE INFO

#### Article History:

Received Date: 01 July 2022

Accepted Date: 15 September 2022

#### Keywords:

Mediation, Mediated Settlement Agreements, Enforcement of Mediated Settlement Agreements, Contracts and settlement agreements.

#### Citation:

W A Saranee Wasana Gunathilaka<sup>1</sup>, Samurdhi Jayamaha. (2022). *Mediation and the Myth of Enforceability*. Proceedings of SLIIT International Conference on Advancements in Sciences and Humanities, (11) October, Colombo, 150 - 156.

### ABSTRACT

Mediation is a trending alternative dispute resolution mechanism despite some of its alleged shortcomings. One such is that the mediated outcome lacks enforceability, which is not the case in real life. Whereas various jurisdictions have expressly dealt with this alleged issue, in the absence of any explicit provision for the same, a mediation settlement agreement could also be enforced in a Court of law, by treating it as a regular contract. The presence of the highest form of autonomy in the mediation process makes its settlement agreement qualified at the outset to be considered as a contract. More pertinently, offer; acceptance; consideration; intention to create a legally binding relationship; legality and capacity as fundamental requisites of a legally enforceable contract is often seen to be present in a mediation settlement agreement, thus allowing it to be enforceable as a contract between the parties who have freely entered into such agreement to settle their dispute. It is therefore accurate to conclude that the unenforceability of a mediated outcome is a myth even where there is no specific provision to that effect.

\* Samurdhi, samurdhi.j@sliit.lk

## INTRODUCTION

At least in Sri Lanka, it is often alleged that mediation as a dispute resolution method does not lead to an enforceable solution. Thus, many argue that the time and effort invested in arriving at an unenforceable solution is a waste. This misunderstanding has undoubtedly contributed to the lack of popularity of mediation in Sri Lanka. Therefore, this paper seeks to clarify this common misunderstanding drawing references to examples from and out of the region, on the enforceability of mediated settlements. The paper will analyse the similarities between an enforceable contract and a mediated settlement in light of the English contract law principles and argues that a mediated settlement has the same force of enforceability as a contract entered into by parties in compliance with the contract law principles.

### Nature of Mediation and the Mediated Settlement Agreement

Mediation is an alternative dispute settlement mechanism used worldwide to resolve a variety of disputes including civil, commercial, public, and certain criminal matters. It is a process whereby the parties have full autonomy in resolving their dispute and arriving at a solution of their choice. This negotiation between the parties is essentially facilitated through a mediator. However, the mediator does not pronounce any decision, judgement, or decree on the dispute but merely assists the parties to arrive at a settlement. Thereby, the mediation process guarantees that the final settlement is reached solely based on the mutual consent of the parties. The voluntary nature of mediation and the highest degree of party autonomy guarantees that the parties are not coerced into settlements. Any party unsatisfied with the process is free to withdraw themselves from the process just as they submitted before. The primary role of the mediator is to support the parties in overcoming the communication barrier that is often experienced in disputes. The mediator is

then expected to guide the parties to identify the issues and the interests of the dispute while moving away from positions or demands and help parties to arrive at creative solutions that would best address their interests. Moreover, the reality checks by the mediator further assist the parties to make an informed and conscious decision as to the suggested solutions and their ramifications.

As such, a mediated settlement agreement is the outcome of the mediation process. Many argue that non-adjudicatory processes – such as negotiation, conciliation, mediation, and early neutral evaluation are not binding themselves, but agreements reached through those processes could be made binding.<sup>255</sup> For instance, a mediated agreement can be expressed as a binding contract, which could then be enforced in a Court of law.<sup>256</sup> As such, a mediated settlement agreement, which is often deduced into writing, is expected to be an agreement which reflects the informed consent of parties exercising the highest form of party autonomy in arriving at the settlement terms, with uncertainty in its execution at minimal. Needless to say, the intended outcome will be at a loss if either party act in bad faith in the process. Nevertheless, it could very well be argued that the voluntary nature of the mediation process removes such possibility or the need to act in bad faith as they should invest time and resources in the process. However, in the rarest cases as such, the enforcement of the settlement agreement can be challenged on one or more grounds of vitiating factors such as fraud, misrepresentation, mistake, or duress.<sup>257</sup>

Pertinently, the Sri Lankan Supreme Court recognizes the importance of mutual settlement agreements and has even referred matters to be settled through mediation. This is evident in the case of *Ispat Corporation (Pvt) Ltd v. Ceylinco Insurance Co Ltd & others*<sup>258</sup>, though it was not a success for issues inherent to the instant case. Moreover, the Court has also pronounced upon the importance of mediated/conciliated settlement agreements even in complicated matters such as partition,

<sup>255</sup> Doyle, Margaret., *Advising on ADR: the essential guide to appropriate dispute resolution*. (1<sup>st</sup> Edition, 2000, Advice Services Alliance)

<sup>256</sup> *ibid*

<sup>257</sup> Giordano, C. Anna., *Mediation at the Intersection with Contract Law: The Settlement Agreement* (June 1, 2013).

Available at SSRN: <https://ssrn.com/abstract=2272989> or <http://dx.doi.org/10.2139/ssrn.2272989>

<sup>258</sup> SC CHC Apl 21/2010,

[http://www.supremecourt.lk/images/documents/sc\\_chc\\_appeal\\_21\\_2010.pdf](http://www.supremecourt.lk/images/documents/sc_chc_appeal_21_2010.pdf)

as demonstrated in the case of *Senani v. Emalin & others*<sup>259</sup>. Aluwihare J, in his judgment, referred to how amicable settlements are more desirable and successful than a judicial decree imposed on the parties.

The foregoing analysis thus emphasizes that mediated settlement agreements are founded upon mutual consent and party autonomy and that there is no involvement of the third-party mediator in the final decision made by the parties, i.e., to settle or not. Therefore, it is argued that a mediated settlement agreement is essentially similar to a contract between two or more parties resulting from a negotiation.

### **Enforceability and its significance**

The dictionary meaning of '*enforceability*' reads as the ability to make people obey act or accept a particular course of action.<sup>260</sup> Law of Contract on the other hand defines, an enforceable contract as an agreement with all the legal elements of a valid contract, i.e. offer, acceptance, intention to create a legal relationship, consideration, capacity and legality.<sup>261</sup> The enforceability of an agreement is thus affected in the absence of one or more of the above ingredients. If any party defaults in their obligations under an agreement so entered, the other party may compel the performance of such terms of the agreement and/or payment of damages for such failure in a Court of law. The party so complaints of the alleged breach of contract in Court, has the burden to establish that their contract qualifies as an enforceable contract on a balance of probabilities. Conversely, the defaulting party may take up defences to challenge the enforceability of a contract, such as the absence of essentials in a valid contract or the presence of vitiating factors such as mistake, duress, coercion, fraud etc.

Parties expect nothing but the due performance of the contract, in compliance with the terms agreed, upon by all parties. Similarly, parties further expect that an agreement would safeguard them from any

form of defaulting by the other party. The absence of such a guarantee would deter parties from entering into contracts. This is one of the key reasons why parties most often seek legal assistance to contract and insist on deducing the same into writing with notarial attestation in the presence of witnesses. Furthermore, every diligent party would at the time of the agreement, insert a dispute resolution clause into the agreement in the hope of preparing themselves to manage a future default. Categorically, their objective is to attain justice through the Court's intervention in the event of a default by the other party. To that effect, the availability of an enforcement procedure is vital. This is even more elucidated by the fact that contract enforceability is a sub-index of the Ease of Doing Business Index. As such Sri Lanka is currently ranked as below 164 out of 190 countries in the same.<sup>262</sup> It is common knowledge that no commercial relationship will exist without a formal contract. For businesses, whether private or public, the enforceability of contracts/agreements is essential for their success, depending entirely upon the effective and efficient execution of the contracts.

### **Enforcement of Mediated Settlements**

A settlement agreement is an agreement entered into between parties to a dispute, to resolve the same. As a form of dispute resolution, parties in certain cases decide to opt for alternative dispute resolution methods such as negotiation, mediation, conciliation, contractual adjudication or arbitration. Such choice is often based on cost and time efficiency, the high level of party autonomy, maintenance of the amicable relationship between parties and confidentiality, as guaranteed by these alternative mechanisms as opposed to litigation/judicial adjudication.

Nevertheless, the misconception that settlements arrived through these alternatives are unenforceable often deters the parties from espousing these methods, particularly negotiation and mediation. In other words, it is

<sup>259</sup> SC Appeal No. 151/2016, SC Minutes 14/12/2020,<sup>262</sup> Doing Business 2020, [http://www.supremecourt.lk/images/documents/sc\\_appeal\\_15\\_1\\_2016.pdf](http://www.supremecourt.lk/images/documents/sc_appeal_15_1_2016.pdf) <https://www.doingbusiness.org/content/dam/doingBusiness/country/s/sri-lanka/LKA-LITE.pdf>

<sup>260</sup> Cambridge Dictionary

<sup>261</sup> Elliot, C., Quinn, F., Elliott & Quinn's Contract Law (12<sup>th</sup> Ed., Pearson, 2019)

believed that if one party defaults, the innocent party is left with no effective solution to compel the defaulting party to oblige with and/ or compensate appropriately. The analysis below however argues that this notion is merely a myth and is caused primarily due to the lack of understanding of the nature of the mediation process and its settlements.

The law governing mediation in Sri Lanka is the Mediation Boards Act No. 72 of 1998 and the Mediation (Special Categories of Disputes) Act, No. 21 of 2003. Section 11 of the former Act provides that the settlement agreed upon by the disputants should be reduced to writing and be signed by the Chief Mediator. Provisions have also been made for the parties to obtain copies of such settlement and in the case of such dispute was referred by the Courts to the mediation board, a copy of the settlement is to be submitted to the Court to enter a decree in accordance with such settlement. Where there is no involvement of the court and the parties fail to adhere to the settlement terms, the Board shall be notified of the same and it shall assist the parties to enter a fresh settlement. If such settlement cannot be arrived at, the Board shall issue a certificate of non-settlement.<sup>263</sup> Similar provisions could be seen in Mediation (Special Categories of Disputes) Act also.<sup>264</sup> The absence of any express provision in law for the enforcement of a mediated settlement further contributes to the understanding that mediated settlements are unenforceable.

#### ***Direct enforcement vs. Indirect Enforcement of Mediated Settlement Agreements***

Mediated Settlement Agreements (MSA) could be enforced either directly or indirectly. Direct enforcement of MSA requires legislation which explicitly recognizes and facilitates such enforcement.<sup>265</sup> Conversely, in the absence of such legislation, parties could initiate litigation and enforce a MSA as any other contract, i.e., through indirect enforcement.

Various jurisdictions worldwide have employed diverse mechanisms to directly enforce a MSA, *inter alia* through filing it in a Court for summary proceedings (e. g. in Italy, Latvia, Hungary, Lithuania)<sup>266</sup>, enactment of MSA in an enforceable notarial deed (e. g. in Austria, Belgium)<sup>267</sup>, validation of MSA by a mediation body (e. g. Estonia)<sup>268</sup>, transference of MSA into an arbitral consent award (e. g. Austria, Germany)<sup>269</sup>, the inclusion of an enforceability clause (e. g. Croatia, Portugal)<sup>270</sup>, the transformation of MSA into a judgement on agreed terms for it to become directly enforceable (e. g. Israel, New Zealand, Japan), transformation MSA to a Court decree in Court mediation or in cases where there is a pending action filed in Court (e. g. China, Brazil, India, Sri Lanka)<sup>271</sup>, enforcement by a notary deed (e. g. Japan) and Approval of MSA by a Conciliation authority (e. g. Switzerland)<sup>272</sup>.

Despite the above examples, many jurisdictions including Sri Lanka do not have a mechanism to transform an MSA into a directly enforceable title, particularly when they are entered into, without any pending action in court. In such instances, parties could enforce a MSA treating it as a contract between the parties. Irrespective of having to resort to litigation, this enforcement is still more cost and time effective, than a full-blown litigation of the entire dispute. In this regard, it is pertinent to inquire into the possibility of the same within the Sri Lankan legal system. Consequently, it should be noted that Section 408 of the Sri Lankan Civil Procedure Code, recognizes settlements outside of the Court even when a case is pending. Once a such settlement is arrived at by the parties and the Court is notified of the same, the Court issues a decree accordingly which unequivocally has the effect of a judgement pronounced by the Court. Thus, it is apparent that Sri Lankan Courts would be willing to recognize settlements of disputes as entered by parties as also indicated above.

On another note, as regards International Settlement Agreements resulting from

<sup>263</sup> Section 14 of the Mediation Boards Act 1998

<sup>264</sup> Section 13 and 17 of the Act respectively.

<sup>265</sup> Zukauskaitė, Migele., Enforcement of Mediated Settlement Agreements, 2019, [https://www.researchgate.net/publication/333230886\\_Enforcement\\_of\\_Mediated\\_Settlement\\_Agreements](https://www.researchgate.net/publication/333230886_Enforcement_of_Mediated_Settlement_Agreements),

<sup>266</sup> *ibid*

<sup>267</sup> Peters, Nick., The Enforcement of Mediation Agreements and Settlement agreements resulting from Mediation

[https://assets.contentstack.io/v3/assets/blt3de4d56151f717f2/blt62397fba71994a5f/5fb7dafc65bdd35303e0453f/CMJ\\_2542-4602\\_2019\\_003\\_102\\_005.pdf](https://assets.contentstack.io/v3/assets/blt3de4d56151f717f2/blt62397fba71994a5f/5fb7dafc65bdd35303e0453f/CMJ_2542-4602_2019_003_102_005.pdf)

<sup>268</sup> *ibid*.

<sup>269</sup> *ibid*.

<sup>270</sup> *ibid*.

<sup>271</sup> Peters, Nick., n(11)

<sup>272</sup> *ibid*.

mediation are concerned, the Singapore Mediation Convention, Singapore International Mediation Center Rules on Enforcement and the European Union Mediation Directive are the enforcement mechanisms available with their inherent positives and drawbacks.<sup>273</sup> However, this paper limits its scope to clarifying the common myth about the enforceability of MSA and does not wish to analyse the former. The international practice amply confirms that MSA whether national or international could be enforced, directly or indirectly, depending on the legal landscape of each country. As such this paper is limited to analysing how a locally mediated settlement agreement can be indirectly enforced as a contract, particularly given the absence of direct enforcement, other than the out-of-court settlements arrived at pending litigation.

#### ***Indirect enforcement of mediated settlements: to enforce as a contract***

At the outset, it is emphasized that the mediator does not sign the settlement agreement as a party to the agreement. In certain jurisdictions, the mediator is required to sign the agreement as a witness to it as any other. However, does not carry any further legal significance for the agreement.

Firstly, for an agreement to be recognized as an enforceable contract, the existence of an offer and acceptance is essential. An offer is a *promise or commitment to perform* or refrain from performing some specified future act made by the offeror. An offer should be *reasonably certain*, express an *objective intent* on the part of the offeror to perform as offered and must be *communicated* to the offeree.<sup>274</sup> Secondly, the said offer must be accepted by the party to whom it is directed at. According to the law of contract, an acceptance is a *voluntary act by the offeree* and not by any other third party, either in the form of *words or of conduct*, that indicates agreement to the terms of the offer. Acceptance must also be *unequivocal* and must be *communicated* to the offeror<sup>275</sup> and could be deduced through the signatures and the placement of the company seal. In the case

of MSA, the terms might not necessarily indicate who brought the offer to the table and who accepted the same, but without a doubt, it establishes that there had been an offer, which is serious, definite, and communicated to the other party and is unequivocally and unqualifiedly accepted by the other in writing as recognized by law.<sup>276</sup>

The next and often more complex element to establish in a contract is the exchange of sufficient consideration. This is known as the *quid pro quo* element of a contract and is often recognized as “*an act or forbearance of one party, or the promise thereof, is the price for which the promise of the other is bought, and the promise is thus given for value is enforceable*”<sup>277</sup>. Common to most cases relating to MSA, consideration would be *inter alia* giving up on litigation, saving cost and time from litigation and avoiding the risk of losing the entire dispute and avoiding the risk of damage to the company's reputation. Accordingly, it is evident that settlement agreements arising from mediation, contain consideration. Additionally, the law also requires consideration to be sufficient for a contract to be enforceable. Adequate consideration demands that a contract constitutes a fair value while sufficient consideration only considers the value as a factor irrespective of whether it is fair or not. The consideration requirement is worth studying in mediation because the underlying dispute may involve unclarified rights, claims, or interests.<sup>278</sup> Similar to any other contract, consideration should not present an obstacle to judicial enforcement of MSA, even though the value of the consideration may be difficult to ascertain.<sup>279</sup> This is because a Court generally respects the notion that a promisor is bargaining for peace of mind and that parties could contract as they deem reasonable and thus will not assess the adequacy of the consideration exchanged.<sup>280</sup> This is confirmed through Section 408 of the Civil Procedure Code of Sri Lanka, which provides for the enforcement of out-of-court settlements of pending matters. As such the Courts would not necessarily take into account the legal rights and interests, so long as it

<sup>273</sup> *ibid.*

<sup>274</sup> Elliot, C., Quinn, F., n(7)

<sup>275</sup> *ibid.*

<sup>276</sup> Zukauskaitė, Miglė., n(9)

<sup>277</sup> Elliot, C., Quinn, F., n(7)

<sup>278</sup> Payne, Cathelene C., Enforceability of Mediated Settlements (1986) 1:2 Journal on Dispute Resolution 385 <https://core.ac.uk/download/pdf/159563608.pdf>

<sup>279</sup> Payne, Cathelene C., n(22)

<sup>280</sup> *ibid.*



appears objectively that the parties were satisfied with the adequacy of the consideration of the settlement agreement. Moreover, the principle of freedom to contract together with the recognition that individuals could assess the value of their interests suggests that courts should respect the parties' mediated agreement.<sup>281</sup>

Intention to create a legally binding relationship is another essential to enforce a contract, and undoubtedly MSA is founded upon the same. The voluntariness and highest level of party autonomy involved in the mediation process and the trained facilitation through a mediator, affirm the intention of the parties to be bound by the terms they have agreed to. Yet again, the only exception to this would arise from defences such as mistake, fraud, or duress, as held by Nawaz J, in *Indrani Chandralatha v. Elrick Ratnum*<sup>282</sup>. Accordingly, a settlement arrived mutually between parties, has the force of law, particularly when it was entered in as a judgement of a court under section 408 of the Code of Civil Procedure. Arguably, one could contend that parties lack the intention to create a legally binding settlement when they are neither before a Court nor refer to the law in their agreement. However, the case of *Abberley v. Abberley*<sup>283</sup> confirmed that the presence of the signatures and the context in which the settlement is arrived at, i.e. the resolution of a long-standing dispute, essentially created an intention to create a legally binding relationship. Therefore, the commitment one makes, by placing his/ her signature/ seal on to a document carrying terms to which he duly consented at the time of placing such signature, constitutes his intention to be bound by such terms legally, whether the terms refer to the law or not. Nevertheless, this is qualified by the requirement of legality as any other contract. Thus, any MSA would be enforced, only so far as the settlement agreement complies and is not inconsistent with the existing law and public policy.

The requirement of capacity as another ingredient to an enforceable contract requires any party involved in a MSA to be of legal age to contract, be of sound mind and most

importantly to have authority to enter such agreements when entered on behalf of a company or an institution. Any institution authorising such persons to negotiate and enter into such agreements shall do so according to the law, by enacting resolutions to that effect. Therefore, only the parties with decision-making authority must participate in the mediation process and agree on terms over which they have been vested with the necessary authority. To this effect, mediators are supposed to inquire from the parties as to whether they have the authority to represent the parties to the dispute at mediation at the very beginning of mediation or the pre-mediation conference stage.

In all the circumstances, it is evident that MSA is like any other contract entered into between parties, and therefore can be enforced as contracts if they comply with the above requirements. To challenge such enforcement, parties may resort to consent vitiating defences such as fraud, mistake, misrepresentation, and duress under contract law.<sup>284</sup> However, this paper does not intend to analyse the same. Although not discussed at this point, it must be borne in mind that there is a challenge to the confidentiality of the mediation process when enforcing MSA indirectly, as contracts.

## CONCLUSION

Mediation has the potential of being the most sought-after ADR mechanism if certain misconceptions about its enforceability are eliminated. This paper argues that Mediated Settlement Agreements, as the outcome of the mediation process, contain the elements of an enforceable contract under the general contract law and thereby it could amount to an enforceable outcome.

The voluntary nature and the highest level of party autonomy involved in the mediation process unequivocally result in a voluntary outcome as the mediator is also just a facilitator in the process. Although, unable to identify the offeror and the offeree in process, a clear and definite offer, its unqualified acceptance communicated to the other party is capable of being clearly established with respect to

<sup>281</sup> *ibid.*, 391, 392

<sup>282</sup> C.A. R.I. Case No. 64/2012,

[http://courtofappeal.lk/index.php?option=com\\_phocadownload&view=category&download=5057:ca-ri-642012-edirisinghe-](http://courtofappeal.lk/index.php?option=com_phocadownload&view=category&download=5057:ca-ri-642012-edirisinghe-)

[arachchilage-indrani-chandralatha-vs-elrick-ratnum-hon-ahmd-nawaz-j&id=81:august&Itemid=130](http://arachchilage-indrani-chandralatha-vs-elrick-ratnum-hon-ahmd-nawaz-j&id=81:august&Itemid=130)

<sup>283</sup> [2019] EWHC 1564 (Ch)

<sup>284</sup> Payne, Cathelene C., n(23)

mediated settlements. Moreover, sufficient consideration in the form of surrendering the right to litigation, time and cost involved in mediation could be listed among many other things the parties bring to the negotiation table. The intention to create a legally binding relationship could be adduced through their voluntary submission to mediation followed by the signatures they place on the MSA. Undoubtedly, compliance with law and policy is a concern for any contract so as for MSA and as regards capacity is concerned the parties should be authorized to enter into contracts.

Thus, it is concluded that in the absence of any enforcement mechanism, mediated settlement agreements are capable of being enforced as contracts under contract law, provided that they comply with the essential elements of a contract.

## REFERENCES

- Mediation Boards Act, No. 72 of 1998
- Mediation (Special Categories of Disputes) Act, No. 21 of 2003
- Ispat Corporation (Pvt) Ltd v. Ceylinco Insurance Co Ltd & others SC CHC Apl 21/2010,
- Senani v. Emalin & others SC Appeal No. 151/2016, SC Minutes 14/12/2020,
- Indrani Chandralatha v. Elrick Ratnum C.A. R.I. Case No. 64/2012,
- Abberley v. Abberley [2019] EWHC 1564 (Ch)
- Doyle, Margaret., Advising on ADR: the essential guide to appropriate dispute resolution. (1<sup>st</sup> Edition, 2000, Advice Services Alliance)
- Elliot, C., Quinn, F., Elliott & Quinn's Contract Law (12<sup>th</sup> Ed., Pearson, 2019)
- Giordano, C. Anna., Mediation at the Intersection with Contract Law: The Settlement Agreement (June 1, 2013). Available at SSRN: <https://ssrn.com/abstract=2272989> or <http://dx.doi.org/10.2139/ssrn.2272989>
- Payne, Cathelene C., Enforceability of Mediated Settlements (1986) 1:2 Journal on Dispute Resolution 385 <https://core.ac.uk/download/pdf/159563608.pdf>
- Peters, Niek., The Enforcement of Mediation Agreements and Settlement agreements resulting from Mediation [https://assets.contentstack.io/v3/assets/blt3de4d56151f717f2/blt62397fba71994a5f/5fb7dafc65bdd35303e0453f/CMJ\\_2542-4602\\_2019\\_003\\_102\\_005.pdf](https://assets.contentstack.io/v3/assets/blt3de4d56151f717f2/blt62397fba71994a5f/5fb7dafc65bdd35303e0453f/CMJ_2542-4602_2019_003_102_005.pdf)
- Zukauskaitė, Miglė., Enforcement of Mediated Settlement Agreements, 2019, [https://www.researchgate.net/publication/333230886\\_Enforcement\\_of\\_Mediated\\_Settlement\\_Agreements](https://www.researchgate.net/publication/333230886_Enforcement_of_Mediated_Settlement_Agreements)



## Promoting Sri Lanka as a Seat of International Arbitration: Lessons to be Learnt from International Jurisdictions

\*<sup>1</sup>M.D. Chavindri Chiranga Perera

<sup>1</sup>\*Staffordshire University, United Kingdom

---

### ARTICLE INFO

#### Article History:

Received Date: 01 July 2022

Accepted Date: 15 September 2022

---

#### Keywords:

Commercial Disputes; ADR; Arbitration in Sri Lanka; Arbitration Seats; Issues and Reforms for the current system.

---

#### Citation:

M.D. Chavindri Chiranga Perera. (2022). *Promoting Sri Lanka as a Seat of International Arbitration: Lessons to be Learnt from International Jurisdictions*. Proceedings of SLIIT International Conference on Advancements in Sciences and Humanities, (11) October, Colombo, 157 - 163.

---

\* Chavindri, chavper99@gmail.com

---

### ABSTRACT

Alternative Dispute Resolution (ADR) refers to a range of mechanisms available for the resolution of disputes such as Negotiation, Mediation, Conciliation and Arbitration, which are settlement-oriented processes, adopted in place of Litigation through Courts that are adversarial in character. Among the said alternative processes, Arbitration is popularly preferred across the globe for the resolution of commercial disputes for the numerous benefits it has to offer. This ease of facilitating international commercial contracts and dispute resolution pertaining thereto, offered by the arbitral process has made it a decisive factor for a country to sustain good international trade and commercial relations. Accordingly, Sri Lanka brought about several mechanisms over the years, procedurally and otherwise, to promote Sri Lanka as an attractive seat of arbitration.

Nevertheless, despite the statutory framework, infrastructure, facilities and Arbitration-friendly atmosphere sought to be instituted, the findings from this study identified that Sri Lanka has not performed to its expectations of functioning as a hub of arbitration in South Asia. This study identifies certain loopholes through lessons learnt from other popular arbitration seats. It is recommended to improve and revamp the statutory framework providing for arbitration in Sri Lanka to overcome several



anomalies discussed therein, in addition to meeting the gaps in terms of infrastructure and other facilities, to relieve the prospects of effective arbitration promoting cross-border investments in this era of advanced technology and globalization.

## INTRODUCTION

'This Act is targeting the foreign investments as well as expediting the resolution mechanism to suit the fast-moving economic trends.'<sup>285</sup> At the time when the Arbitration Act no.11 of 1995 was a bill in the parliament, on 10<sup>th</sup> May 1995, Sri Lanka's the then Minister of Justice shared his vision on how this new law would facilitate and enhance the arbitration practice and promote trade and commercial activities of Sri Lanka. Arbitration is the buzz-word in contracts, pursued to resolve commercial disputes, where the litigants would present their respective positions before a neutral and independent third person called the 'Arbitrator' looking for a resolution.<sup>286</sup> The Arbitration Act no. 11 of 1995 of Sri Lanka is the preliminary Arbitration law in South Asia, articulated based on the United Nation Commission on International Trade Law (UNCITRAL) Model Law and further inspired by the Swedish Arbitration Law.

As decided in *Sulamerica v Enesa Engenharia*<sup>287</sup>, arbitration allows parties to decide the applicable governing law in a multinational contract. Among the expeditiousness and less bitterness between the parties, it also allows flexibility in permitting the choice of the parties on selecting the seat, the procedure to be adopted and the appointment of arbitrator(s) as stipulated in Art. 10, Art. 19 and Art.20 of UNCITRAL Model law.<sup>288</sup> In *Ashville Investments Ltd v Elmer Contractors Ltd*<sup>289</sup> provides that, "a non-statutory arbitrator derives his jurisdiction from the agreement of the parties at whose instance he is appointed. He has such jurisdiction as they

agree to give him and none they do not". Thus, the jurisdiction of the arbitral tribunal stems from the contract along with its scope and mandate and a valid arbitration agreement is a bar to court proceedings. In that, once arbitral proceedings are initiated, the court only plays a supportive; supervisory role in minimizing and controlling its intervention.<sup>290</sup>

Sri Lanka is equipped with institutions such as ICLP and SLNAC and other resources, in addition to having ratified the Convention on the Recognition and Enforcement of Foreign Award of 1958 (The New York Convention) providing for the recognition of foreign arbitral awards.

Nonetheless, it is now evident that Arbitration in Sri Lanka has been unsuccessful in portraying any affirmative record as envisaged by the Minister. Parties are reluctant to forward their disputes to Arbitration in Sri Lanka over Arbitration destinations like Singapore, London, Dubai, and Hong Kong.

## MATERIALS AND METHODS

Literature review based on primary and secondary legal sources under the Qualitative Research paradigm and expert interviews with senior practitioners in arbitration, arbitrators and the learned members of the judiciary were adopted for this Study.

## RESULTS AND DISCUSSION

The domestic arbitral regime is losing its vigour. Parties in Sri Lanka have lost their faith in the process, with most of them posing doubt as to whether arbitration has eased or acted as a needless barricade in the speedy resolution of disputes, in light of the drawbacks identified below.

- a) Provisions are made for interim measures in the Judicature Act<sup>291</sup>, Civil Procedure Code and the Arbitration Act. The Arbitration Act<sup>8</sup> allows the

<sup>285</sup> N M M Nihaaj, 'Critical Analysis of Arbitration Method Used in The Construction Industry of Sri Lanka' (*DI.lib.uom.lk*, 2016)14

<<http://dl.lib.uom.lk/bitstream/handle/123/13045/Full-thesis.pdf?sequence=1&isAllowed=y>> accessed 6 May 2022.

<sup>286</sup> Latham & Watkins, 'Guide to International Arbitration' (*Lw.com*, 2017)

<<https://www.lw.com/thoughtleadership/guide-to-international-arbitration-2017>> accessed 8 May 2022.

<sup>287</sup> *Sulamerica CIA Nacional De Seguros SA and others v Enesa Engenharia SA* [2012] EWHC 42 (Comm);[2012]EWCA Civ 638

<sup>288</sup> Mahesh Abeynayake and Chitra Wedikkara, 'Arbitration as An Alternative Dispute Resolution Method in The Construction Industry of Sri Lanka' (2012) 3

<[https://www.irbnet.de/daten/iconda/CIB\\_DC25085.pdf](https://www.irbnet.de/daten/iconda/CIB_DC25085.pdf)>

<sup>289</sup> *Ashville Investments Ltd v Elmer Contractors Ltd* [1989] QB 488

<sup>290</sup> K. Kanag-Isvaran, 'Arbitration – Why Has It Not Worked? A Comment On The Operation Of The Arbitration Act' (*LawNet*, 2013) <<https://www.lawnet.gov.lk/arbitration-why-has-it-not-worked-a-comment-on-the-operation-of-the-arbitration-act/>> accessed 30 May 2022.

<sup>291</sup> Judicature Act No. 2 of 1978

tribunal to order interim measures necessary to protect or secure the claim which forms the subject matter of the dispute by virtue of s.13. S.13(2) stipulates that such an award granting interim measures may be enforced in the High Court, wherein s.13(3) grants special recourse for the waiver in s.5 to not be applicable for such applications under s.13(2).

This has been supported by judicial precedents namely, in *Bino Tyres*<sup>292</sup> which was followed by *Francis Chaminda Perera v OIC of Police Negombo and Others*<sup>293</sup>. It is also noteworthy that where it becomes necessary to obtain interim relief before the setting up of the arbitral tribunal or if such measures may involve a person who is not a party to the arbitration agreement, the Act is silent. However, Sri Lankan courts have not hesitated to grant such relief at this juncture. Therein, one could seek interim measures under the Judicature Act<sup>294</sup>. In *Baksons Textile v Hybro Industries*<sup>295</sup>, *Edussuriya J* held in the Court of Appeal that, ‘...However, it is my considered view that until such time a final order resolving any dispute or an interim order is made by the Arbitrator, a party is entitled to come before the District Court and obtain interim relief to maintain the status quo.’ Thus, the judicial precedent has enabled the opportunity for a party in limited circumstances pending recourse to an arbitral tribunal, to seek interim relief under the Judicature Act. Nevertheless, the absence of a clear provision to that effect could be viewed as an anomaly since it has created a grey area in the law. Also, pursuant to the grant of an arbitral award, it has to be enforced in court within one year if it was not honoured. But, during this period, if the assets or claim forming the subject matter of the dispute have been dissipated or moved out of the country by the party against whom the award is made, the arbitral process in its entirety is rendered nugatory, despite its lengthy proceedings. It would thus be useful to see if applications could

be made to the court to preserve the status quo until the enforcement of the arbitral award and a judgment and decree of the court is obtained.

Comparatively, Interim measures are strongly provided for by Art.17 of UNCITRAL Model Law and in prominent institutional arbitration rules such as Singapore International Arbitration Centre (SIAC) Rules<sup>296</sup> by rule no. 30 and the London Court of International Arbitration (LCIA) Rules<sup>297</sup> by its Art. 25.

It is also noteworthy that Art. 17(B) of the Model Law enables the tribunal to grant interim relief not only to preserve the status quo but also to ‘take action that would prevent, or refrain from taking action that is likely to cause, current or imminent harm or prejudice to the arbitral process itself’. Hence, where parties make such applications to stall the arbitration process, or various other parallel applications to delay the arbitral proceedings, interim relief could be obtained against such party; although, we don’t find this relief in the Sri Lankan Act.<sup>298</sup>

Moreover, Art.9 of the Model Law<sup>299</sup> expressly recognize the right of a party to an arbitration agreement to seek interim measures from a court **before or during** arbitral proceedings. The Indian Arbitration and Conciliation Act 1996<sup>300</sup> formulated based on the UNCITRAL Model Law also makes an express provision to that effect by s.9 of the Indian Act. Nevertheless, the Sri Lankan Act is silent on the grant of interim relief before or during proceedings. Although it could be argued that this lacuna has been addressed in *Baksons* case<sup>301</sup>, an incomprehensive legal framework curtails the development of the law. It is also interesting to note that under Art.17(1) of the Model Law<sup>18</sup> and s.17 of the Indian Act, the parties may, by express agreement, take away the power of the arbitral tribunal to grant interim measures, which is not a provision recognized under the Sri Lankan Act.

The novel concept of ‘Emergency Arbitrators’ is another initiative made available in prominent arbitration institutions. The LCIA

<sup>292</sup> Elgitread Lanka (Private) Limited v Bino Tyres (Private) Limited (SC (Appeal) No. 106/08) at Page 140.

<sup>293</sup> Francis Chaminda Perera v OIC of Police Negombo and Others CA PHC 171/2012 decided on 26.03.2019

<sup>294</sup> Judicature Act No. 2 of 1978

<sup>295</sup> Baksons Textile Industries Ltd v Hybro Industries Ltd CA no. 51/97, argued and decided on 28.04.1997

<sup>296</sup> Singapore International Arbitration Centre (SIAC) Rules of 2016

<sup>297</sup> London Court of International Arbitration (LCIA) Rules of 2020

<sup>298</sup> Bar Association of Sri Lanka, ‘Key Issues and Recent Developments Of Arbitration’ (*Youtube.com*, 2021) <<https://www.youtube.com/watch?v=EDhTXOSeNz8>> accessed 20 May 2022.

<sup>299</sup> UNCITRAL Model Law on International Commercial Arbitration, 1985

<sup>300</sup> Arbitration and Conciliation Act No.26 of 1996

<sup>301</sup> Baksons Textile Industries Ltd v Hybro Industries Ltd CA no. 51/97, argued and decided on 28.04.1997

Rules<sup>302</sup> by Rule 9.4 of Art. 9B provides for the *'immediate appointment of a temporary sole arbitrator to conduct emergency proceedings pending the formation of the tribunal'*. Keeping in par with the use of modern technology for expedited means of communication, Rule 9.5 of Art. 9B requires the application for such an emergency arbitrator to be made by electronic means, upon which, within three days from the receipt of such application, the emergency arbitrator shall be appointed by the LCIA Court by virtue of Rule 9.6. Rule 9.8 requires such an Emergency Arbitrator to determine the claim for immediate relief, within 14 days from the date of his appointment. SIAC Rules<sup>303</sup> also facilitate emergency arbitrators in light of Rule 30.2 read with Schedule 1 thereto, where it requires the appointment of an emergency arbitrator within one day of receipt of the application and shall make his interim order within 14 days from his appointment, subject to other provisions of the Schedule thereto. However, there are no such emergency arbitration arrangements available in Sri Lanka.

Additionally, 'expedited procedure' is also a novel mechanism adopted by arbitration institutions that has drawn much attention over the years. Rule 5 of SIAC Rules introduces an 'expert procedure' to parties in the event of an exceptional urgency, as may be agreed between the parties, where the aggregate amount of claim of the respective dispute is not exceeding S\$6,000,000. Here, the tribunal may consult the parties and rule on whether the dispute is to be determined solely based on documentary evidence or if any hearings are required for witness examinations, experts or any oral argument and within six months from the formation of the tribunal, the final award shall be made. LCIA too facilitates expedited procedures where a party applies in writing through electronic means in instances of exceptional urgency under Rule 9A of LCIA Rules, wherein the LCIA Court shall decide such application as expeditiously as possible. Unfortunately, Sri Lanka has not seen such developments.

- b) In addressing the form of an Arbitration Agreement, it is notable that the UNCITRAL Model Law<sup>20</sup> has given a broad interpretation to the definition and form of the arbitration agreement by Art.7. Even though the Sri Lankan Act<sup>304</sup> is based on the Model Law and recognizes by s.3, an exchange of letters, telexes or telegrams or other methods (supposedly inclusive of E-mail) as constituting a 'written agreement' for that section, it is found to be too narrow. Therein, Model Law by Art. 7(5) recognizes that an *exchange of statements of claim and defence in which the existence of an agreement is alleged by one party and not denied by the other* too would fall within the ambit of an 'agreement in writing'. Art. 7(4) also recognizes that the requisite of 'agreement in writing' would also be met by *'electronic communication if the information contained therein is accessible so as to be useable for subsequent reference'*. These provisions enable the law on arbitration to be on par with the fast-evolving technological trends that facilitate trade and commerce globally. For instance, an exchange of messages through the platform WhatsApp was accepted as forming an arbitration agreement between parties in the Civil Law jurisdiction of Germany.<sup>305</sup> Hence, at this juncture where the world is battling against Covid-19 and online arbitrations, are preferred over constraints on physical meetings, Sri Lankan Act may not qualify to be on par with the developments.<sup>306</sup>
- c) Moreover, s.11 of the Arbitration Act which enshrines the doctrine of '*Kompetenz-Kompetenz*' has also drawn wide criticism. It connotes that the tribunal possesses the authority to determine questions on its jurisdiction. Over statutory developments, this doctrine has undergone certain tweaks

<sup>302</sup> London Court of International Arbitration (LCIA) Rules of 2020

<sup>303</sup> Singapore International Arbitration Centre (SIAC) Rules of 2016

<sup>304</sup> Arbitration Act No.11 of 1995

<sup>305</sup> Bar Association of Sri Lanka, 'Key Issues and Recent Developments of Arbitration' (Youtube.com, 2021)

<<https://www.youtube.com/watch?v=EDhTXOSEnz8>> accessed 20 May 2022.

<sup>306</sup> Saleem Marsoof, 'Arbitration Procedure, Law And facilities In Sri Lanka', *Arbitration in Commonwealth Countries - An Anthology* (2016)

<[https://www.academia.edu/12938711/Arbitration\\_Procedure\\_Law\\_and\\_Practice\\_in\\_Sri\\_Lanka](https://www.academia.edu/12938711/Arbitration_Procedure_Law_and_Practice_in_Sri_Lanka)> accessed 20 May 2022

in a different jurisdiction, laying down three approaches, namely, (i) Jurisdictional questions can be posed only to the arbitral tribunal, (ii) Jurisdictional questions can be posed to the arbitral tribunal OR the competent court and (iii) The jurisdictional issue can be raised with the Arbitral Tribunal and if a party is dissatisfied with the ruling by the Tribunal, then appeal to the Competent Court. This approach (iii) aforesaid, is observed to be the preferred approach by other prominent arbitration seats. Art 16(3) of the Model Law<sup>307</sup> stipulates that *'if the tribunal rules as a preliminary question that it has jurisdiction, any party may request, within thirty days after having received notice of that ruling, the court specified in article 6 to decide the matter, which decision shall be subject to no appeal; while such a request is pending, the arbitral tribunal may continue the arbitral proceedings and make an award.'* SIAC under Rule 28.2<sup>308</sup> and LCIA under Rule 23.1<sup>309</sup> follow similar approaches. Nevertheless, the language in s.11 of the Sri Lankan Arbitration Act<sup>310</sup> denotes that the tribunal may decide questions on its jurisdiction, prevalence and validity of an arbitration agreement, public policy or incapability of being performed, but, High Court may also decide on those questions, upon the application by any party to arbitration proceedings. This has posed numerous practical difficulties since the aforesaid provision is commonly misinterpreted, resulting in parallel applications made to the tribunal and the High Court simultaneously, causing further delays, confusion and defying the doctrine of competence of the tribunal at the same time. Further, this parallel jurisdiction in turn resembles that courts have original jurisdiction, contrary to the 'minimal court intervention' objective a country should ensure, for an

arbitration-friendly environment. Another aspect of this issue is that s.26 providing that the award shall be final and binding on parties, subject to provisions in Part VII, clearly denotes that when the tribunal makes an award, the only circumstances that one could apply to court against such tribunal's decision is found in Part VII of the Act, that is, to enforce or appeal against the award. Both these circumstances arise when the arbitrator has gone into the merits and gives an award (post-determination). Whereas, S.11 of the Act is found in Part IV of the Act, but nowhere does it say that once the jurisdictional objection is raised before the tribunal, a parallel application could be made to a court or court by way of an appeal. Thus, although it is commonly done, it is a wrong procedure that is being adopted. Hence, whilst these provisions defy the universal doctrine, it also creates great confusion and lacks clarity at the same time.

Among other shortcomings, inadequate time period for correction of errors in the arbitral award (being 14 days according to the Act); especially in a proceeding where it involves foreign arbitrators, the Sri Lankan not geared to facilitate multiparty contracts (in which most construction contracts involve over two parties) or where the arbitration agreement could be binding on third parties or non-signatories, no provision for joinder of third parties or third-party notice<sup>311</sup>, not recognizing the doctrine of 'Group of Companies'<sup>312</sup>, the judiciary not being supportive or arbitration-friendly, lack of Awareness of the ordinary public about arbitration, arbitrators tending to be biased towards the party that appoints him/her, lack of facilities to train arbitrators and experts such as engineers sought to be appointed as arbitrators, having no institutions or facilities to train counsels for these settlement-oriented mechanisms leading to a lack of arbitration-supportive attitude among counsels and arbitrators defying the underlying objectives of

<sup>307</sup> UNCITRAL Model Law on International Commercial Arbitration, 1985

<sup>308</sup> Singapore International Arbitration Centre (SIAC) Rules of 2016

<sup>309</sup> London Court of International Arbitration (LCIA) Rules of 2020

<sup>310</sup> Arbitration Act No. 11 of 1995

<sup>311</sup> Avindra Rodrigo, 'In Brief: Arbitration Agreements In Sri Lanka' (*Lexology*, 2021)

<<https://www.lexology.com/library/detail.aspx?g=acbeca65-2359-405e-98c5-eb8e42eef4cb>> accessed 20 May 2022.

<sup>312</sup> *Dow Chemicals Company & Ors v. Isover Saint Gobain* [ICC Award No. 4131, YCA 1984, at 131 et seq.]

the arbitral process, arbitration centres not facilitating virtual hearings for witnesses from overseas impedes the promotion of Sri Lanka as a seat for international arbitration.

### Way Forward

Consequently, the Act should be revamped to cater to the modern trends in arbitration, overcoming the drawbacks aforesaid. The centres should be geared with adequate facilities to facilitate effective proceedings. Artificial Intelligence (AI) in arbitration where human-led arbitrations are replaced by machines have come to light effecting an expeditious approach free of biases.<sup>313</sup> Another mechanism which could be learnt and adopted from Singapore is the TPF mechanism. This is where a third party could fund or provide financial support on behalf of the party to arbitrate which will encourage the parties since arbitration is a very expensive process.<sup>314</sup> A comprehensive legal regime backed by an arbitration-friendly environment is a *sine qua non* for establishing Sri Lanka as a regional centre in South Asia and also given that the Colombo Port City is to have its own jurisdictional zone and international arbitration centre. However, Justice Saleem Marsoof proposed to necessarily call for a change of attitude among parties involved, while improving and reforming the local arbitration procedure to increase its efficiency and reap its benefits.<sup>315</sup>

### REFERENCES

#### Case Law, Statutes and Institutional Arbitration Rules:

- Sulamerica CIA Nacional De Seguros SA and others v Enesa Engenharia SA [2012] EWHC 42 (Comm); [2012] EWCA Civ 638
- Ashville Investments Ltd v Elmer Contractors Ltd [1989] QB 488
- *Dow Chemicals Company & Ors v. Isover Saint Gobain* [ICC Award No. 4131, YCA 1984, at 131 et seq.]

- Francis Chaminda Perera v OIC of Police Negombo and Others CA PHC 171/2012 decided on 26.03.2019
- Baksons Textile Industries Ltd v Hybro Industries Ltd CA no. 51/97, argued and decided on 28.04.1997
- Elgitread Lanka (Private) Limited v Bino Tyres (Private) Limited (SC (Appeal) No. 106/08) at Page 140
- Arbitration Act No. 11 of 1995
- ICC Rules of 2021
- Singapore International Arbitration Centre (SIAC) Rules of 2016
- London Court of International Arbitration (LCIA) Rules of 2020
- UNCITRAL Model Law on International Commercial Arbitration 1985

#### Books:

- Marsoof S, 'Arbitration Procedure, Law And facilities In Sri Lanka', *Arbitration in Commonwealth Countries - An Anthology* (2016)  
<[https://www.academia.edu/12938711/Arbitration\\_Procedure\\_Law\\_and\\_Practice\\_in\\_Sri\\_Lanka](https://www.academia.edu/12938711/Arbitration_Procedure_Law_and_Practice_in_Sri_Lanka)> accessed 20 May 2022.

#### Websites:

- Latham & Watkins, 'Guide to International Arbitration' (*Lw.com*, 2017)  
<<https://www.lw.com/thoughtleadership/guide-to-international-arbitration-2017>> accessed 8 May 2022
- Gupta V, 'Arbitration: A Perspective - Litigation, Mediation & Arbitration - India' (*Mondaq.com*, 2020)  
<<https://www.mondaq.com/india/arbitration-dispute-resolution/935374/arbitration-a-perspective>> accessed 7 May 2022
- Kanag-Isvaran K, 'Arbitration – Why Has It Not Worked? A Comment On The Operation Of The Arbitration Act' (*LawNet*, 2013)  
<<https://www.lawnet.gov.lk/arbitratio>>

<sup>313</sup> Sonal Kumar Singh, Sayantika Ganguly and Anish Jaipuriar, 'An International Commercial Hub' (2020) 4 *Manurawa Law Journal*  
'Artificial Intelligence In Arbitration: Revolutionary Or Impractical - Litigation, Mediation & Arbitration - India' (*Mondaq.com*, 2021)  
<<https://www.mondaq.com/india/arbitration-dispute-resolution/1027248/artificial-intelligence-in-arbitration-revolutionary-or-impractical>> accessed 20 May 2022.

<sup>314</sup> Sashini Wijesinghe, 'Evaluating The "Public Policy" With Judicial Intervention In International Commercial Arbitration Process In Sri Lanka And Mechanisms To Develop Sri Lanka As

<<https://sllchrm.lk/manurawa/doc/19>> Shashini Wijesinghe.p df> accessed 20 May 2022.

<sup>315</sup> Mahesh Abeynayake and Chitra Wedikkara, 'Arbitration as An Alternative Dispute Resolution Method In The Construction Industry of Sri Lanka' (2012) 2  
<[https://www.irbnet.de/daten/iconda/CIB\\_DC25085.pdf](https://www.irbnet.de/daten/iconda/CIB_DC25085.pdf)>

n-why-has-it-not-worked-a-comment-on-the-operation-of-the-arbitration-act/> accessed 30 May 2022

- Rodrigo A, 'In Brief: Arbitration Agreements In Sri Lanka' (*Lexology*, 2021)  
<<https://www.lexology.com/library/detail.aspx?g=acbeca65-2359-405e-98c5-eb8e42eef4cb>> accessed 20 May 2022

#### Research Papers:

- Nihaaj N, 'Critical Analysis of Arbitration Method Used in The Construction Industry of Sri Lanka' (*Dl.lib.uom.lk*, 2016)  
<<http://dl.lib.uom.lk/bitstream/handle/123/13045/Full-thesis.pdf?sequence=1&isAllowed=y>> accessed 7 May 2022
- Abeynayake M, and Wedikkara C, 'Arbitration as An Alternative Dispute Resolution Method in The Construction Industry of Sri Lanka' (2012)

[https://www.irbnet.de/daten/iconda/CIB\\_DC25085.pdf](https://www.irbnet.de/daten/iconda/CIB_DC25085.pdf) accessed 7 May 2022

#### Journals:

- Wijesinghe S, 'Evaluating The “Public Policy” With Judicial Intervention In International Commercial Arbitration Process In Sri Lanka And Mechanisms To Develop Sri Lanka As An International Commercial Hub' (2020) 4 *Manurawa Law Journal* <[https://slchrm.lk/manurawa/doc/19\).ShashiniWijesinghe.pdf](https://slchrm.lk/manurawa/doc/19).ShashiniWijesinghe.pdf)> accessed 20 May 2022
- Marsoof S, 'Recognition & Enforcement Of Arbitral Awards' (2013) 20 *The Bar Association Law Journal* <[https://www.academia.edu/8256129/Recognition\\_and\\_Enforcement\\_of\\_Arbitral\\_Awards](https://www.academia.edu/8256129/Recognition_and_Enforcement_of_Arbitral_Awards)> accessed 27 May 2022



## Right to Information vs. Right to Protect Personal Data: A Guidance from the Decisions of the USA & the European Court of Justice.

R.L.W. Rajapakse\*<sup>1</sup>

<sup>1</sup>The Open University of Sri Lanka

### ABSTRACT

#### ARTICLE INFO

##### Article History:

Received Date: 01 July 2022

Accepted Date: 15 September 2022

##### Keywords:

Right to information; right to privacy; personal data protection; public authorities.

##### Citation:

R.L.W. Rajapakse. (2022). *Right to Information vs. Right to Protect Personal Data: A Guidance from the Decisions of the USA & the European Court of Justice*. Proceedings of SLIIT International Conference on Advancements in Sciences and Humanities, (11) October, Colombo, 164 - 169.

Right to Information (RTI) and right to privacy (RTP) are two basic rights of people in a democratic country. Since personal data consists of a main element of privacy, the right not to disclose one's personal data to a third party is an essential part of the RTP. The citizens of Sri Lanka have had the right of obtaining information that is in the custody of public authorities since 2017 under the RTI Act. When deciding whether requested information will be disclosed or not, the public authority will have to consider the exceptions stipulated in the said Act, including the exception of privacy. However, with the enactment of the Personal Data Protection (PDP) Act in 2022 in Sri Lanka, it is crucial to consider the impact of the said Act on the RTI Act. Under the above context, this research explored the overlapping provisions of these two legislations and the decisions of the USA & the European Court of Justice in similar matters. This research study utilized the qualitative methodology where the researcher studied, analyzed, and synthesized a variety of materials gathered through primary and secondary sources to formulate a conclusion and come up with the study results. Finally, the research revealed that the PDP Act has put the additional liability on the public authorities when considering information requests under the RTI Act. Further, the research has identified some guidance from the decided cases of the USA & the European Court of Justice regarding overlapping provisions.

\* Rajapakse

## INTRODUCTION

With the enactment of the Personal Data Protection (PDP) Act in 2022 in Sri Lanka,<sup>316</sup> concerns have arisen about whether it lowers the effectiveness of the Right to Information (RTI) Act.<sup>317</sup> While the RTI Act ensures transparency and openness in governmental activities, the PDP Act restricts the disclosure of information related to individuals. Thus, these two legislations act like two sides of the same coin. 'Privacy' stands as a ground that justifies the non-disclosure of information unless the larger public interest justifies such disclosure.<sup>318</sup> The RTI Act stipulates that a request for information shall not be refused where the public interest in disclosing the information outweighs the harm that would result from its disclosure.<sup>319</sup> Accordingly, a public authority to whom a request for information related to personal data is received will have to weigh up the 'privacy rights' against the 'public interest'. Thus, discretion has been granted to public authorities in disclosing personal data in their custody. Furthermore, the RTI Act has granted immunity to public authorities from civil or criminal liability for anything which, in good faith, is done under the RTI Act<sup>320</sup>. As such, it is important to see whether this discretion and the immunity granted by the RTI Act to public authorities undermine the protection provided for personal data by the PDP Act or vice versa.

Under the above background, it is expected by this research to explore the overlapping provisions in the law on RTI and PDP in Sri Lanka in the light of the decisions of the USA & the European Court of Justice, with the idea of obtaining some guidance. Therefore, the central research problem of this study will be how to weigh up the public interest against privacy rights when considering an information request received by a public authority under the RTI Act in Sri Lanka.

## MATERIALS AND METHODS

This is doctrinal or non-empirical research that studies the overlapping provisions in the RTI and PDP law in Sri Lanka and intensively explores the decisions of the USA & the European Court of Justice. The researcher analyses various kinds of materials gathered through primary and secondary sources to formulate a conclusion and come up with the study results. Being primary sources, legislations of Sri Lanka and case law were studied in the light of the decisions of the USA & the European Court of Justice. Secondary sources such as reports, journal articles, legal treaties, etc. were used to explore the importance of having enforceable laws on RTI while avoiding unwarranted invasion of individual privacy.

## RESULTS AND DISCUSSION

### The Law of Sri Lanka

The RTI is a fundamental right granted to the citizens of Sri Lanka by the 19<sup>th</sup> amendment to the Constitution. The RTI is paramount as none of the other fundamental rights can effectively be implemented without having the necessary information for the implementation of such rights.<sup>321</sup> The RTI is derived from its mother right of 'the right to expression' and it promotes democratic administration through openness, transparency, and people's involvement in the decision-making process.<sup>322</sup> However, the RTI is not an absolute right and it is to be enjoyed subject to the conditions prescribed by law.<sup>323</sup> In terms of the RTI Act, every citizen of Sri Lanka shall have a right of access to information that is in the possession, custody, or control of a public authority.<sup>324</sup> The information held by public authorities may include various personal data of citizens and if such information is made subject to RTI, it can lead to a massive invasion of the privacy of an individual.<sup>325</sup> The RTI Act itself explains the exceptions for the right to

<sup>316</sup> Personal Data Protection Act No. 9 of 2022.

<sup>317</sup> Right to Information Act No. 12 of 2016.

<sup>318</sup> Article 14A of the Constitution of Sri Lanka and Section 5(1)(a) of the RTI Act.

<sup>319</sup> Section 5(4) of the RTI Act.

<sup>320</sup> Section 30 of the RTI Act.

<sup>321</sup> Cassim, F., 2009. Seeking access to the confidential records of a third party: the accused's right to a fair trial v the third party's right to privacy. [online] JSTOR. Available at: <<https://www.jstor.org/stable/23253216>> [Accessed 26 April 2022].

<sup>322</sup> Jeewanthi, M., 2018. තොරතුරු දැන ගැනීමේ අයිතිවාසිකම .Stamford Lake Publication, pp.25-32.

<sup>323</sup> Article 14(2) of the Constitution.

<sup>324</sup> Section 3 of the RTI Act.

<sup>325</sup> Shairwal, S. and Singh, S., 2022. Can RTI and Right to Privacy go hand in hand? -Court to the rescue. [online] S3.amazonaws.com. Available at: <<https://s3.amazonaws.com/documents.lexology.com/055a46f2-bbb5-4ce1-83f7-3057512df138.pdf?AWSAccessKeyId=AKIAVYILUYJ754JTDY6T&Expires=1651727857&Signature=>



access the information held by public authorities.<sup>326</sup> Accordingly, a public authority shall refuse requests of the information related to personal information the disclosure of which has no relationship to any public activity or interest, or which would cause unwarranted invasion of the privacy of the individual unless the larger public interest justifies the disclosure of such information.<sup>327</sup> The term personal information has not been interpreted in the RTI Act, however as per the PDP Act, 'any information that can identify a data subject directly or indirectly, by reference to, an identifier such as a name, an identification number, financial data, location data, or an online identifier; or one or more factors specific to the physical, physiological, genetic, psychological, economic, cultural, or social identity of that individual or natural person is considered as personal data.'<sup>328</sup> Furthermore, the term 'public interest' has not been interpreted in the RTI Act, however, as per the PDP Act, the term 'public interest' includes 'public health, social protection, management of healthcare services, control of communicable diseases and other serious threats to health, and official authorities for achieving the purposes of objects laid down by law.'<sup>329</sup>

Unlike the RTI, there is no express recognition of the Right to Privacy (RTP) as a fundamental right in Sri Lanka. However, some international conventions such as the Universal Declaration of Human Rights<sup>330</sup> and the International Convention on Civil and Political Rights<sup>331</sup> which Sri Lanka is a party to have recognized the RTP as a fundamental right. Until the enactment of the PDP Act in 2022, the RTP has been protected in Sri Lanka as a 'delict' within the notion of *actio injuriarum* which has been developed by case law such as *Nadarajah Vs Obeysekara*<sup>332</sup> and *Ratnatunga Vs. The State*.<sup>333</sup>

Every person has a right to control the dissemination of confidential information concerning them as its release could impact their private life and intrude on their RTP.<sup>334</sup> Moreover, neither RTI nor RTP is an absolute right, hence a balance has to be struck between the right to access information and the right to third party's privacy.<sup>335</sup> The PDP Act introduces seven obligations in processing personal data<sup>336</sup> and the term 'processing' includes inter alia disclosure, transmission, and making available of personal data.<sup>337</sup> Therefore, in the event of any inconsistency between the provisions of the two Acts, the disclosure of personal data based on a request made under the RTI Act will be subject to the obligations stipulated under the PDP Act<sup>338</sup>. However, the PDP Act also recognised 'public interest' as a ground for lawful processing of personal data, hence, it seems a consistency has been maintained between these two Acts.

### Law of the USA & the European Union

The United States Supreme Court has introduced three principles to deny information requests under 'unwarranted invasion of personal privacy'. The first one is to see whether the request falls into the basic purpose of the Freedom of Information Act of the USA (FOIA). The second one is to consider the citizens' legitimate expectation of privacy, and the third one is to see whether the request seeks official information about a government agency. If the request seeks mere records that the government happens to be storing, the invasion of privacy is considered unwarranted.<sup>339</sup> The literature in this regard supports the view that government agencies should be prohibited from disclosing information about a private individual, other than the requester unless that information sheds light on 'what the government is up to'.<sup>340</sup>

SWZLT0zU9DEPRqh9%2B8%2Fm3awa8BE%3D>  
[Accessed 5 May 2022].

<sup>326</sup> Section 5 of the RTI Act.

<sup>327</sup> Section 5(1)(a) of the RTI Act.

<sup>328</sup> Section 56 of the PDP Act.

<sup>329</sup> Paragraphs (e) and (g) of schedule 1 of the PDP Act.

<sup>330</sup> Article 12 of UDHR.

<sup>331</sup> Article 17 of ICCPR.

<sup>332</sup> *Nadarajah Vs Obeysekara* (1971) 52 NLR 76.

<sup>333</sup> *Sinha Ratnatunga Vs. The State* (2001) 2 SLR 172.

<sup>334</sup> Cassim, F., 2009. Seeking access to the confidential records of a third party: the accused's right to a fair trial v the third party's right to privacy.

[online] JSTOR. Available at:  
<<https://www.jstor.org/stable/23253216>>  
[Accessed 26 April 2022].

<sup>335</sup> Ibid.

<sup>336</sup> Section 5-11 of the PDP Act

<sup>337</sup> Section 56 of the PDP Act.

<sup>338</sup> Section 3 of the PDP Act.

<sup>339</sup> *United States Department of Justice vs. Reporters Committee for Freedom of the Press* (1989) 489 US 449,772.

<sup>340</sup> Cate, F., Fields, D. and McBain, J., 1994. THE RIGHT TO PRIVACY AND THE PUBLIC'S RIGHT TO KNOW: The "Central Purpose" of the Freedom of Information Act.

[online] JSTOR. Available at:

Further, it has been argued that the basic purpose of the FOIA is to open, Agency actions to the light of public scrutiny and that determination as to whether to release information must turn on the nature of the requested document and its relation to the basic purpose of the FOIA.<sup>341</sup> Accordingly, information requests that do not match the basic purpose of the FOIA can be rejected based on unwarranted invasion of privacy.

In the European Union, while Regulation (EC) No. 45/2001<sup>342</sup> stipulates matters on PDP, Regulation (EC) No. 1049/2001<sup>343</sup> stipulates matters regarding RTI. It is interesting to explore the decisions of the European Court of Justice on matters overlapping the provisions of these two regulations. In Case C-28/08 P, the Court (Grand Chamber) held that these two regulations have different objectives as Regulation No. 1049/2001 is designed to ensure the greatest possible transparency of the decisions making process of the public authorities, thus it is designed to facilitate as far as possible the exercise of the right of access to documents and to promote good administrative practices, whereas Regulation No. 45/2001 is designed to ensure the protection of the freedoms and fundamental rights of individuals, particularly their private life, in the handling of personal data.<sup>344</sup> It was further held that, as these two regulations do not contain any provisions granting one primacy over the other, the full application of both regulations should, in principle, be ensured, and therefore when a request based on Regulation No. 1049/2001 seeks access to documents, including personal data, Regulation No. 45/2001 becomes applicable in its entirety. Although there is no requirement of giving reasons for requesting information under Regulation No. 1049/2001, the Court, in this case, held that the requester of the information shall demonstrate the necessity of the

requested personal data as stipulated in Article 8 of the Regulation 45/2001, enabling the public authority to weigh up the different interests of the parties.<sup>345</sup> The principle created in this case was fully adopted and applied in a later Case T-82/09 by the General Court (Second Chamber).<sup>346</sup>

In the Sri Lankan context, personal privacy has been protected in the RTI Act with the exception of public interest. The 'public interest' has been accepted as a ground for 'law full processing of personal data' under the PDP Act. Thus, it seems these two Acts in Sri Lanka go hand in hand but still, there is no clear guidance to weigh up the 'public interest' against the 'privacy rights'. Furthermore, there is no provision in the PDP Act in Sri Lanka for the requester of personal data to establish the public interest or the necessity of having the requested data as stipulated in Article 8 of Regulation No. 45/2001 of the European Union. Therefore, the application of these judgments without amending the PDP Act is questionable in Sri Lanka, though it is very good guidance for weighing up the public interest against privacy rights. However, in Sri Lanka, the burden of proof as to any particular fact lies on that person who wishes the court to believe in its existence,<sup>347</sup> it can be argued that, even without amending the PDP Act, a public authority may refuse disclosure of personal data in its possession if the requester has not provided sufficient materials to weigh up the 'public interest' against the 'privacy rights'.

In Case T-190/10, the General Court (Fifth Chamber) of the European Union ruled that if access to certain documents is denied by a public authority on the ground of privacy, it must explain how access to that document could specifically and effectively undermine the privacy rights, and a mere assertion that access would undermine privacy is not sufficient.<sup>348</sup> Accordingly, the test applied here, to verify

<<http://www.jstor.org/stable/40709746>> [Accessed 26 April 2022].

<sup>341</sup> Ibid.

<sup>342</sup> Regulation (EC) No. 45/2001 of the European Parliament and of the Council of 18 December 2000 stipulates matters on the Protection of individuals with regard to the processing of personal data by the community institutions and bodies and on the free movement of such data.

<sup>343</sup> Regulation (EC) No. 1049/2001 of the European Parliament and of the Council of 30 May 2001 stipulates matters regarding public access to

European Parliament, Council and Commission documents.

<sup>344</sup> Commission vs Bavarian Lager [2010] Case C-28/08 P (Grand Chamber of European Union).

<sup>345</sup> Ibid.

<sup>346</sup> Gert-Jan Dennekamp vs European Parliament [2011] Case T-82/09 (General Court of European Union)

<sup>347</sup> Section 103 of the Evidence Ordinance No. 14 of 1895 as amended.

<sup>348</sup> Kathleen Egan and Margaret Hackett vs European Parliament [2012] Case T-190/10 (General Court of European Union).

whether the privacy rights being undermined, was reasonable foreseeability, and not purely hypothetical. Furthermore, the General Court, in this case, refused the argument of the European Parliament that, seeking information for filing litigation is not of public interest and it is only of private interest. However, under Sri Lankan law, the burden of proof to establish public interest is on the applicant,<sup>349</sup> so it can be argued that the public authority does not need to establish how access to such information could undermine privacy rights, even if justice requires it.

In Case T-903/16, the General Court (Ninth Chamber) concluded that refusal to access one's own personal data under the exception given in Regulation 45/2001 without giving sufficient reasons is unlawful. Court held that according to the settled case law, the statement of reasons must be appropriate to the measure at issue and must disclose clearly and unequivocally the reasoning followed by the institution which adopted the measure, in such a way as to enable the persons concerned to ascertain the reasons for it and to enable the competent court to exercise its power of review.<sup>350</sup>

## CONCLUSIONS

From the aforesaid exploration, it can be identified following guidance to be used by a public authority in weighing up privacy rights against the public interest. Firstly, the public authority shall not forget the main purpose of the RTI Act as envisaged from the preamble of the Act and it shall not go beyond that purpose and disclose information. If the request does not match the purpose of the RTI Act, it can be concluded that the 'privacy rights' overrides the 'public interest'. Secondly, if the request does not relate to the official services of the public authority, and if it seeks mere records that the public authority happens to be storing, the invasion of privacy is considered unwarranted. Furthermore, the information requester when requesting personal data of individuals shall reveal why he needs such data enabling the authority to weigh up the RTI against the RTP although giving reasons is not a requirement under the RTI Act. However, this requirement

would amount to ultra vires of the RTI Act, hence, it is suggested to stipulate this requirement in the RTI Act and the PDP Act to strengthen this point. On the other hand, justice warrants the public authorities also, when denying access to certain information, without mere invoking the exception of 'privacy', to demonstrate how revealing such data would undermine the privacy rights of the data subject. It is apparent that, although the objectives of the RTI and PDP Acts are completely different, both the Acts in Sri Lanka go hand in hand, as the PDP Act stipulates 'public interest' as lawful processing of personal data and the RTI Act stipulates 'privacy' as an exception for RTI, which will be overridden by 'public interest'. However, the PDP Act has put additional responsibilities on the public authorities when considering requests made under the RTI Act.

## REFERENCES

- Cassim, F., 2009. Seeking access to the confidential records of a third party: the accused's right to a fair trial v the third party's right to privacy.
- Cate, F., Fields, D. and McBain, J., 1994. THE RIGHT TO PRIVACY AND THE PUBLIC'S RIGHT TO KNOW: The "Central Purpose" of the Freedom of Information Act.
- Commission vs Bavarian Lager [2010] Case C-28/08 P (Grand Chamber of European Union).
- Gert-Jan Dennekamp vs European Parliament [2011] Case T-82/09 (General Court of European Union).
- Jeewanthi, M., 2018. තොරතුරු දැන ගැනීමේ අයිතිවාසිකම .Stamford Lake Publication, pp.25-32.
- Kathleen Egan and Margaret Hackett vs European Parliament [2012] Case T-190/10 (General Court of European Union)
- Nadarajah Vs Obeysekara (1971) 52 NLR 76.
- RE vs European Commission [2019] Case T-903/16 (General Court (Ninth Chamber) of the European Union) (online).
- Shairwal, S. and Singh, S., 2022. Can RTI and the Right to Privacy go hand in hand? -Court to the rescue.

<sup>349</sup> Section 103 of the Evidence Ordinance No. 14 of 1895 as amended.

<sup>350</sup> RE vs European Commission [2019] Case T-903/16 (General Court (Ninth Chamber) of the European Union).

- Sinha Ratnatunga Vs. The State (2001) 2 Sri LR.
- United States Department of Justice vs. Reporters Committee for Freedom of the Press (1989) 489 US 449,772.



## A Fly in the Ointment; Undue Liability on E-commerce Platforms

\*<sup>1</sup>Krishanthi Rajaguru

<sup>1</sup>\*Asia Pacific Institute of Technology

### ARTICLE INFO

#### Article History:

Received Date: 01 July 2022

Accepted Date: 15 September 2022

#### Keywords:

E-commerce, platform liability; platform law; policy consideration; law reforms.

#### Citation:

Krishanthi Rajaguru. (2022). *A Fly in the Ointment; Undue Liability on E-commerce Platforms*. Proceedings of SLIIT International Conference on Advancements in Sciences and Humanities, (11) October, Colombo, 170 - 174.

### ABSTRACT

Trade is now largely internet-centric, meaning internet is the medium through which most commercial transactions take place in today's (information) economy. E-commerce has not only provided a greater market, but it also has changed the way businesses operate. This is indeed a platform economy. E-commerce is considered one of the main drivers of recent economic and social developments globally. In Sri Lanka e-commerce is emerging and in its infancy. The industry is currently expected to be operating within the margin of the law and self-regulated. In the absence of a separate law for e-commerce, e-commerce platforms (e-commerce marketplaces) meaning digital storefronts that connect sellers and customers to transact online, are exposed to a higher risk of being unreasonably penalized by applying the existing laws without mitigation. On the other hand, the platform users are left in a desperate situation with no remedy for harm caused. This article explores the responses of advanced jurisdictions such as China, the EU and the USA which are giant e-commerce markets, regarding platform liability. This study concludes that facilitating a business-enabled environment with holistic and innovative strategies that are aligned with social and economic status of the country with a business-friendly legal landscape that matches the reality of the industry is imperative.

\* Krishanthi, Krishanthi.rajaguru@outlook.com

## INTRODUCTION

Digital platforms are the emblematic form of organizations in this digital economy, which is a whole new legal category with its own characteristics. It does not fall into the conventional categories. They use information communication technology to interact between users, collect and use data, and benefit from network effect. European Commission's public consultation on platform regulation defines a platform as an undertaking operating in two (or multi)-sided markets, which uses the internet to enable interactions between two or more distinct but interdependent groups of users to generate value for at least one of the groups<sup>351</sup>. These platforms are generally considered intermediaries and thus enjoy a certain level of legal immunity in some jurisdictions such as safe harbour protection under the EU e-commerce Directive(2000/31/EC), which is, however, currently being criticized by many as an outdated concept. Whilst some argue that stringent laws will hinder the growth of the industry and favours autonomy, some suggest a middle approach and enlighten that 'platform liability', should be shifted to the concept of 'platform responsibility'<sup>352</sup>. In this aspect, the remarkable ruling by the United States Court of Appeal in 2019 in *Oberdorf v. Amazon.com*<sup>353</sup> has created a long-haul controversy around platform liability. District Court of Pennsylvania concluded that (based on previous cases which held that Amazon is not the seller), Amazon is not liable for faulty products sold by third-party vendors on Amazon. However, the Court of Appeal has explored the true role of Amazon and explicated the substantial controlling power of the platforms over its users. This determination has challenged the status quo claimed by e-commerce platforms that they are neutral tech-based intermediaries.

Platform liability is a new phenomenon in Sri Lanka. Sri Lanka has passed certain legislation to endorse and validate e-commerce and innovation with the advancement of information communication technology. However, legal challenges in the platform

industry remain untouched. Therefore, a legal and business environment, that is conducive to the growth of e-commerce shall be put in place. Promoting e-commerce which owns a vast export potential due to its global reach, will also be a great aid for the economic recovery in the face of this ongoing macro-economic crisis in the country.

There is a literature and empirical data gap in Sri Lanka in this field of study. Most of the existing studies related to e-commerce have focused only on consumer rights in the digital market, and the field of e-contracts and e-signature. Therefore, there is a necessity to conduct in-depth and systematic studies in the law related to platform liability for the convenience of policymakers. The end goal of this deliberation is to evaluate the gaps in laws in Sri Lanka; to enhance a greater understanding of recent development in the law regime related to platform liability, and to suggest policy considerations which would provide an impetus for forming an elaborated strategy for Sri Lanka to ensure its legal readiness for the e-commerce industry. This study focuses only on platform liability that connects parties to transact online in goods and services such as Amazon.com, eBay and AliExpress. This excludes the service subscription platforms such as Uber Taxi and Airbnb, and content-based platforms such as Facebook, Twitter, Google and Instagram. For this, contemporary developments in advanced jurisdictions were comparatively analyzed by way of a library-based critical review of the literature. To that end, Primary and secondary legal sources were extensively used.

### Platforms' self-regulation

The platform's incentive to self-regulate and stop the misconduct of the wrongdoers is contingent upon the economic and social status of the market the platform operates. On the other hand, characteristics of platforms can lead to monopolistic situations under certain circumstances, (such as customer lock-in and winner-take-it-all), disrupting the healthy competitive nature of the market. When in a monopolistic situation self-regulation is socially

---

<sup>351</sup> European Commission, (2015). PublicDigital Single Market Strategy, Northwestern consultation on the regulatory environment forUniversity Law Review Vol 112, 19-46. platforms, online intermediaries, data and cloud<sup>353</sup> Oberdorf v. Amazon.com Inc., 930 F.3d 136, computing and the collaborative economy 4. 151 (3d Cir. 2019).

<sup>352</sup> Giancarlo, F. (2017). Reforming Intermediary Liability in The Platform Economy: A European

undesirable and a stringent framework would help balance and maintain fair competition and the market order. However, stringent liability has intended and unintended effects and thus needs to be evaluated through an economic assessment. These factors warrant a robust legal framework for the governance of e-commerce platforms with an optimal liability regime.

### **E-laws in Sri Lanka**

Primary legislation applicable to e-commerce in Sri Lanka is Electronic Transactions Act No. 19 of 2006 (ETA) which was enacted based on UNCITRAL Model Law on electronic commerce (1996) and UNCITRAL Model Law on electronic signature (2001). ETA was further amended by Act No. 25 of 2017 recognizing the e-commerce and e-business providers and ensuring the validity of e-contracts. Evidence (Special Provisions) Act No. 14 of 1995 provides admissibility for computer evidence. Computer Crimes Act of No 24 of 2007 (CCA) identifies computer crimes and provides the procedure for investigation and enforcement. Personal Data Protection Act No. 7 of 2022 is the latest addition which addresses challenges in the processing of personal data in the of digital environment where the data flows are highly induced. Other main laws enacted to face challenges posed by technological advancement are Information and Technology Act No. 27 of 2003, Payment and Settlement Systems Act No. 28 of 2005, Payment Devices Frauds Act No 30 of 2006, and Intellectual Property Act No. 36 of 2003 (IP Act). All these laws provide greater certainty to e-commerce businesses but do not adequately address the legal challenges in the e-commerce landscape and platform liability.

### **Legal Recognition for E-Commerce Platforms**

‘Service provider’ is defined under section 38 of the CCA as a) a public or private entity which provides the ability for its customers to communicate through a computer system; and b) any other entity that processes or stores computer data or information on behalf of that entity or its customers. ETA provides two different definitions for ‘intermediaries’ and ‘network service providers’. Intermediary means who act

as a service provider for another person in relation to sending, receiving, storing or processing of electronic communications or related services, and network service provider means who owns, possesses, operates, manages or controls a public switched network or provides telecommunication services. Nevertheless, no distinct recognition has been given to platforms such as e-commerce-marketplaces in any of the laws that exist currently. Besides, no specific and adequate liability exemptions such as ‘*mere conduit*’ is granted for such intermediary service providers or no notice to action or counter-notice provisions are provided as in other jurisdictions such as the EU, US and China.

### **Platform Liability for Third-Party Intellectual Property Rights Violations**

At present, any liability of e-commerce platforms is to be determined under the provisions of the IP Act. For example, a ‘pirated copyright good’ is taken into consideration. ‘Pirated copyright goods’ are defined in the IP Act as ‘any goods which are made without the consent of the copyright holder or person duly authorized by the copyright holder in the country of production and which are made directly or indirectly from an article where the making of that copy would have constituted an infringement of a copyright or a related right by the IP Act. These kinds of violations are inclined to happen more often in the e-commerce environment. As per IP Act, any ‘reproduction’ of such work without the consent of the right holder is a violation<sup>354</sup>, where the reproduction is defined in the IP Act *inter alia* as reproduction includes making one or more copies of work including any permanent or temporary storage of a work in electronic means<sup>355</sup>. Therefore, if a ‘pirated copyright good’ is listed for sale by a third-party vendor on an online marketplace, it is likely that the online marketplace could be held responsible unfairly for violations by third-party vendors.

Similarly, in case of trademark violations, any person who sells or exposes for sale, or has in his possession for sale, or any purpose of trade or manufacture, any goods or things to which any forged Mark or false trade description is applied, may be guilty of an offence, unless it can be proved or otherwise demonstrated that it had no reason to suspect the genuineness of

<sup>354</sup> Intellectual Property Act No. 25 of 1991, S 9.

<sup>355</sup> Intellectual Property Act No. 25 of 1991, S 5.

the mark and that it has taken all reasonable precautions against committing the offence and that otherwise it had at all times acted innocently<sup>356</sup>. Online-marketplaces host and expose these goods for sale once uploaded by a third-party vendor and also may keep them in their possession if the customer's orders are fulfilled by the marketplace. Accordingly, it can be argued that e-commerce platforms are liable for the infringements.

In such circumstances, it can be argued that the liability upon intermediaries is contributory or secondary within the ambit of law where the liability levels would be different, yet the onus will be upon the platform to prove that it had no knowledge that the conduct is wrongful<sup>357</sup>. However, laws in some jurisdictions address these novel challenges. EU e-commerce Directive provides safe harbour protection for platforms. It considers information service providers (ISP) such as e-commerce platforms as '*mere conduits*' and grants a certain level of liability exception, similarly to the US Communication Decency Act (CDA)<sup>358</sup> and the Digital Millennium Copyrights Act<sup>359</sup>. EU by implementing the e-commerce directive intended to ensure the well-functioning internal market for digital services, effective removal of illegal contents in recognition of fundamental rights and an adequate level of information transparency for consumers. Further, EU Model Rules on Online Platforms framed by the European Law Institute suggest that the platform will have no obligation to monitor the actions of its users<sup>360</sup>. 'Notice to action' mechanism has been introduced and practised in many jurisdictions where e-commerce marketplaces will only be held liable for infringement of third-party IPR only when the platform fails to take necessary action as stipulated under the 'notice to action' process upon receipt of notice from the right holder. For example, the new China e-commerce law<sup>361</sup> which came into operation in 2019, provides a clear, and systematic notice-to-action mechanism.

### ***Platform Liability for Consumer Rights***

By applying Consumer Affairs Authority Act of 19 of 2003 (CAA Act) either e-commerce

platforms are left without any liability leaving aggrieved consumers in a desperate situation or e-commerce platforms are forced to be unfairly responsible for actions that are not attributable to them. As the true role of e-commerce platforms in the digital market has not been recognized under CAA Act, within the ambit of the same and related regulations, e-commerce platforms could unreasonably be construed as the seller and hence the liable party for non-compliance.

Platform law is developing globally and addressing these novel challenges posed by the platform economy. EU by implementing liability exceptions under the e-commerce directive intended to encourage the development of e-commerce as unrealistic liabilities would hamper the development of the industry. However, moving on based on changing nature of the industry and the court pronouncements on the applications of liability exceptions, the EU now has embraced further developments. The Digital Market Act (DMA) and The Digital Services Act (DSA) are the latest. Responsibilities and duty of care criteria have been introduced by these new laws. New China E-commerce Law is one of the first comprehensive e-commerce laws. It precisely conceptualizes and distinct different parties to e-commerce. It imposes stronger responsibilities on the online marketplace with a certain level of liability exemption by taking a sensible approach to platform liability and responsibility. These laws acknowledged that fiduciary obligations and platform power justify the platform's responsibility.

## **CONCLUSION**

To conclude; the platform is not simply a new business model, a new social technology, and a new infrastructure, but the fundamental organizational form of the emerging information economy. Legal precedents have been developed in other advanced jurisdictions on the scope, rights, and duties of digital platforms with adequate legal certainty. However, Sri Lankan law is still silent. This adversely impacts the growth of e-commerce industry in Sri Lanka. Thus, a novel governance

<sup>356</sup> Intellectual Property Act No. 25 of 1991, S 186<sup>358</sup> US Communication Decency Act, S 230.

(2). <sup>359</sup> US Digital Millennium Copyrights Act, S 512.

<sup>357</sup> Fernando, F. (2022). The Liability of Internet Service Providers for Copyright Infringement in Sri Lanka: A Comparative Analysis, South Centre. <sup>360</sup> EU Model Rules on Online Platforms, Art 8,9. <sup>361</sup> E-commerce Law of the Republic of China, Art 41-46.



(future-proof) framework that preserves the rights and interests of all parties involved in this virtual market is needed. Therefore, it is imperative to conceptualize in the law the roles, duties, and responsibilities of all parties (actors) involved in e-commerce, meaning online vendors, e-commerce platform providers and consumers and as well as other service providers. Thereby an optimal liability regime for online marketplace shall also be embedded into the law having carefully taken into consideration the intended and unintended economic effects of stringent liability regimes. When the law clears the uncertainties, the industry will follow, and society will adopt it.

## REFERENCES

- Busch, C. (2019). When Product Liability Meets the Platform Economy: A European Perspective on Oberdorf v. Amazon, *Journal of European Consumer and Market Law Volume 8*, 173–216.
- Cohen, J. (2017). Law for the Platform Economy, *51 U.C. Davis L. Rev.*, 133-2014.
- Fernando, F. (2022). The Liability of Internet Service Providers for Copyright Infringement in Sri Lanka: A Comparative Analysis, South Centre.
- Giancarlo, F. (2017). Reforming Intermediary Liability in The Platform Economy: A European Digital Single Market Strategy, *Northwestern University Law Review Vol 112*, 19-46.
- Janger, J, Twerski, A. (2020). The Heavy Hand of Amazon: A Seller not a Neutral Platform, *14 Brooklyn Journal of Corporate, Financial & Commercial Law*. 259-273.
- Lefouili, Y, Madio, L. (2022). The economics of platform liability, *Eur J Law Econ 53*, 319–351
- Lynskey, O. (2017). Society and Economy Working Papers 1/2017. *Regulating 'Platform Power'*, LSE Law, London School of Economics and Political Science Law Department.
- Robert, P. (2020). It's A Jungle Out There: Public Policy Considerations Arising from A Liability-Free Amazon.Com, *60 Santa Clara L. Rev.* 25. 253-286.



**2022  
SICASH**  
SLIIT INTERNATIONAL CONFERENCE ON  
ADVANCEMENTS IN SCIENCES & HUMANITIES

## The Legal Debate on the Commercial Use of Personal Data - A Discussion of the Eu Gdpr Precedent

H. R. Chiranthi Senanayake\*<sup>1</sup>

<sup>1</sup>Faculty of Law of Horizon Campus

---

### ARTICLE INFO

#### Article History:

Received Date: 01 July 2022

Accepted Date: 15 September 2022

---

#### Keywords:

Legal debate, personal data, Eu Gdpr Precedent.

---

#### Citation:

H. R. Chiranthi Senanayake. (2022). *The Legal Debate on the Commercial Use of Personal Data - A Discussion of the Eu Gdpr Precedent*. Proceedings of SLIIT International Conference on Advancements in Sciences and Humanities, (11) October, Colombo, 175 - 181.

---

### ABSTRACT

Although the adoption of the Personal Data Protection Act No. 9 of 2022 in Sri Lanka marked a significant milestone in the commercial use of personal data, the regulation of data use is often debated among international policymakers due to the inherent controversy of the subject. This is especially seen in the European Union (EU) which has a stringent data protection scheme. In light of this legal debate, the discussion in this study centres around the key concern of appropriate regulation and balancing between two competing rights, namely, the freedom to commercially utilise user data in the digital economy, and the protection of the right to privacy and protection from unlawful processing of personal data of the consumer/user. Such an academic conversation is engaged in by deliberating on the legal implications of commercial use of personal data. To this end, the essay will first examine the existing legal systems for commercially processing personal data with specific attention to the European Union (EU) General Data Protection Regulation (GDPR) of 2016 and the associated case law. Next, the essay will discuss three concerns on the present protectionist trajectory of the law, and its impact on the dual role of the law in the digital economy, i.e. as a facilitator of lawful commercial use of personal data and a guardian of privacy rights of data subjects. Thereafter, the essay will discuss three concerns on the present protectionist trajectory of the law, and its impact on the dual role of the law in the

---

\* Chiranthi, chiranthi@horizoncampus.edu.lk

digital economy, i.e., as a facilitator of lawful commercial use of personal data and as a guardian of privacy rights of data subjects. The legal analysis is centralised on the EU personal data protection regime because it is a microcosm of development in general data protection law, which is widely accepted as a global persuasive precedent on the regulation of transnational commercial use of personal data.

## INTRODUCTION

The digital economy and its normalisation since the latter half of the 20<sup>th</sup> century, have thrown conventional economics and law into an existential crisis by contesting established notions of value-based transactions. Though the digital economy has progressively intertwined with offline physical economic activities to achieve a state of co-existence, there are obvious lacunae in systematisation and regulation. An area with such gaps is the global commercial processing of personal data, of digital economy users or consumers (data subjects). There are two main points of consensus on the commercial use of personal data, which are noted from the onset for a productive discussion on the subject. The first point is that data trade is essential, in a reality where every breathing moment of an individual with the technical means to access the internet, is touched or even governed by the digital economy. The second point of consensus is the commercialisation of user data should be regulated because laissez-faire trade in such data has negative externalities. Therefore, the pressing question is not whether user data should be commodified because the digital economy would cease to exist without the commercial use of personal data. It is whether suitable systems and regulatory frameworks exist to allow for lawful commercial use of personal data without unduly hindering its free flow. Hence, the central concern is one of appropriate regulation and the balancing between two competing rights, namely, the

freedom to commercially utilise user data in the digital economy, and the protection of the right to privacy and protection from unlawful processing of personal data of the consumer/user.

### **The EU Regulatory Framework: A Snapshot of the Legal Dilemma of Data Protectionism**

The commercialisation and cross-border commercial use of personal data takes place through every search on Google, online purchase on Ali Baba, share on Facebook and download of Microsoft Office. This sentence alone highlights four key facets regarding the commercialisation of personal data. The first facet is the speed of cross-border exchange of user data. Unlike a trade in physical goods, which require both time and manual systems, most commercial transactions on user data are completed instantaneously. The second facet is the liquidity and free-flowing nature of user data which enables its commercialisation. This is aptly captured by John Perry Barlow when he characterised data as a “-highly liquid- pattern of ones and zeros”. The third facet is a presupposition of ownership over the data by the data subject<sup>362</sup>. Stepanov observes that though the economic value of data is widely accepted, the legal question on ownership of data is yet to be solved<sup>363</sup>. The fourth facet is the concentration of data control on a handful of commercial digital service providers due to the essentiality of the services supplied by these conglomerates. Sands notes that the infamous American tech giants could retain their market leadership due to their capacity to access “vast amounts of data from their users/customers and employ them with their algorithms”<sup>364</sup>. These four facets are amongst many other unique characteristics of personal data, which are transacted globally on a commercial scale. This section will provide a critical overview of the European regulatory framework on the commercial processing of data, as a brief case study on the legal implications of the expanding international commercial use of such user data.

<sup>362</sup> John Perry Barlow, ‘The Economy of Ideas: Selling Wine without Bottles on the Global Net’ (2019) 18 Duke Law & Technology Review 8, 11.

<sup>363</sup> Ivan Stepanov, ‘Introducing a property right over data in the EU: the data producer’s right – an evaluation’ (2019) 34(1) International Review of Law, Computers & Technology

<<https://www.tandfonline.com/doi/full/10.1080/13600869.2019.1631621>> accessed 23 March 2021, 65.

<sup>364</sup> Mike Sands, ‘Customer Data Is The Secret To Silicon Valley’s Success’ *Forbes* (USA 29 November 2017) <<https://www.forbes.com/sites/mikesands1/2017/11/29/customer-data-is-the-secret-to-silicon-valleys-success/#135386886c3b>> accessed 26 March 2021.

Before delineating the EU legal framework on the commercial processing of user data, it is essential to contextualise the framework's approach to data protectionism. Preamble paragraph 01 of the GDPR recognises that "natural persons" have a fundamental right to be protected from personal data processing under two statutes, namely, Article 8(1) of the Charter of Fundamental Rights of the European Union (the 'Charter') and Article 16(1) of the Treaty on the Functioning of the European Union (TFEU). In light of this fundamental right, Article 1(1) notes that the sole objective of the GDPR (similar to that of DPD 1995) is to set out the rules "relating to the protection of natural persons concerning the processing of personal data" and "the free movement of personal data". However, Article 1(3) states that the free flow of user data within the Union will not be hindered by the right to be protected from the processing of personal data. These two provisions reflect an attempt to strike a balance between economic progress and human rights, which is further resonated in Preamble paragraph 04 of the GDPR which states that "the processing of personal data should be designed to serve mankind". The Article further states that the right of data subjects to be protected from personal data processing, is not an absolute right but one that shall be viewed with its social function (benefit) and other fundamental rights, through a lens of proportionality.

A collective reading of these provisions confirms three aspects of the EU's principle on data protectionism. The first aspect is that the GDPR prioritises the conversion of the EU into a free trade digital market for user data. Yet the same commitment to facilitation would not apply to the commercial flow of user data outside of the European Economic Area, possibly because of differences in standards of data protectionism within and outside the Association. Secondly, the right of a data subject to be protected from personal data processing is of equal importance as the free flow of such data in the digital economy. Thirdly, this fundamental right must be guaranteed unless such a guarantee has undue social costs and harms the protection of other basic human rights. Therefore, on the first level of analysis, the GDPR attempts to diplomatically capture and provide a viable solution to the legal dilemma of user data protectionism i.e. the tension between unhindered commercial

use of personal data as the lifeline of the digital economy, and the right to be protected from the processing of personal data. On the second level of analysis, the viable solution proposed by the GDPR is a homogenous, right-centric framework of necessary data processing which aims to facilitate the commercial use of personal data only to the extent that it is necessary.

A brief breakdown of the GDPR provisions and associated case law, on the transfer of and commercial transactions on user data, will further prove the aforementioned analysis of the EU's homogenous framework of necessary data processing. Article 3(1) of the GDPR confirms that the Regulation caters to the commercial processing of personal data at two strata. The first strata are the commercial processing of user data amongst Member States of the EEA, and the second strata is between Member States of the EEA and other countries outside of the Association. In terms of the internal commercial processing of user data, Article 5 lays down several important principles. In a nutshell, the Article requires the Member States to collect necessary data for specific purposes and process personal data lawfully, fairly and transparently whilst maintaining accurate records of such user data. Here, the legal standard to be met by Member States of the EEA in the commercial use of personal data is one of necessity, where what is necessary is what is lawful. Hence it can be argued that the GDPR protects data subjects within the EEA from unnecessary processing of user data.

This raises the question of what is 'necessary processing of data' in commercial and professional terms. Article 6(1)(b) to (f) of the GDPR sets out an exhaustive list of what constitutes the necessary processing of personal data by Member States of the EEA. The terminology of this list is purposefully broad to incorporate a myriad of situations ranging from contractual performance to the "legitimate interests" of parties to commercial processing of data. Article 06 further deems that where the commercial processing of data falls within one of these circumstances of necessity, such processing is lawful. Another important dimension to the legal processing of data is presented in Article 6(1)(a), which states that where the data subject has provided consent for the commercial processing of their data, then such processing is lawful. This provision

must be read together with Article 7, which stipulates that the data controller must obtain provable consent from the data subject where it is required for the processing of their data (Article 7(1)). Consent must be obtained through a “distinguishable” form in cases where the consent is written (Article 7(2)) and the data subject has the right to withdraw such consent at any time (Article 7(3)). It is noteworthy that Article 6(1)(a) on the consent of the data subject, is included as one of the six contexts in which the processing of personal data is lawful. This contests the notion that user data is the ‘personal property’ of the data subject within the EEA and as such it can be used only with the consent of the owner as other personal properties. Stepanov argues that the GDPR read together with the Charter, recognises personal data as “rights, subject to special consideration over which no property rights could be exercised”<sup>365</sup>. Therefore, the GDPR views the processing of personal data from a fundamental rights angle as opposed to an intellectual property angle.

It is apparent from the above analysis, that the GDPR’s legal approach to internal commercial processing of personal data is a homogenous, rights-centric, personal data protection framework operating within the EEA based on the principle of necessary processing, achieved through the standardisation of national laws. However, in the case of the second strata of the commercial processing of personal data, taking place outside of the EEA in a third (non-EEA) country, the GDPR sets out three separate frameworks for data exportation. Bu-Pasha argues that such frameworks extend the territorial scope of the Regulation beyond the EEA and thereby provide the GDPR with extraterritorial jurisdiction, making it an international data protection law<sup>366</sup>. The case of *Bodil Lindqvist* examined the term ‘transfer of data to a third country’ and held in favour of the UK Government’s submission that for such a transfer to take place, personal data must be “directly

transferred” from one party to another, thereby confirming the necessity of intention to transfer<sup>367</sup>. Therefore, there was a distinction drawn between the mere accessibility of personal data by a party outside the EEA and the actual transfer of data to such a party.

### **Politicisation, Riskification and Complication of the Law**

The EU framework for regulating the commercial processing of personal data is so dynamic, that the analysis in this paper will be rendered obsolete in a few months. However, the overview of this legal framework provided in the preceding section, prompts critical thought on the present protectionist direction of the law and its impact on the dual responsibility of the law in the digital economy, as a facilitator of lawful commercial use of personal data and a protector of data subject rights. Hence, this section will focus on the need to remedy three concerns of the EU’s legal system regarding the commercial processing of personal data, which negatively impacts its ability to promote cross-border data flow whilst providing the needed protection to data subjects.

The first concern is the politicisation of the data exportation authorisation processes set out by the GDPR. This is evident from the controversial ‘adequacy decision’ for data transfer between the EU and USA which was successfully contested in two accounts by the *Schrems* Cases. Movius and Krup note that the EU and USA have vastly different approaches to data protectionism because it is heavily regulated in the former whilst the latter adopts an “industry self-regulation and reactive legislation” approach<sup>368</sup>. Despite this difference, the USA adopted the Safe Harbour Agreement in 2000 which allowed for a complete adequacy decision and consequential commercial transfer of personal data. The Snowden revelations on the Prism programme prompted the CJEU hearing *Maximillian Schrems v Data Protection Commissioner*<sup>369</sup>.

<sup>365</sup> Stepanov (n 2) 68

<sup>366</sup> Shakila Bu-Pasha, ‘Cross-border issues under EU data protection law with regards to personal data protection’ (2017) 26(3) Information and Communications Technology Law < <https://www.tandfonline.com/doi/full/10.1080/13600834.2017.1330740>> accessed 30 March 2021, 214.

<sup>367</sup> Case C-101/01 *Criminal Proceedings Against Bodil Lindqvist* [2003] ECR I-12971.

<sup>368</sup> Lauren B. Movius and Nathalie Krup ‘U.S. and EU Privacy Policy: Comparison of Regulatory Approaches’ (2009) 3 International Journal of Communication, 169.

<sup>369</sup> Case C-362/14. *Maximillian Schrems v Data Protection Commissioner* [2015] ECLI:EU:C:2015:650.

The Court ruled that the EC Adequacy Decision 2000/520 is invalid, as the existing framework for data protection in the USA is inadequate to sustain Article 01 of the Decision, which states that the Safe Harbour Agreement together with supportive implementation frameworks, “are considered to ensure an adequate level of protection for personal data transferred”<sup>370</sup>. This Agreement was replaced by the Privacy Shield Agreement which introduced two remedies to issues identified by the CJEU, namely, the EU-US Privacy Shield Ombudsperson and greater transparency on the access of transferred personal data by the US public authorities.

The CJEU in the *Schrems II* case declared the Privacy Shield Agreement invalid, on account of “disproportionate interference with the rights to protection of data and privacy”<sup>371</sup> through programmes such as PRISM and UPSTREAM. There is no intermediate provision in place for data exportation from the EU to the USA, and Wojciech Wiewiorowski who is the European Data Protection Supervisor informed Reuters that a new transatlantic data transfer pact would not be introduced anytime soon. Reuters further reported that the lack of a legal data exportation mechanism has left more than 5000 companies who signed the Privacy Shield Agreement vulnerable to business disruption and privacy lawsuits<sup>372</sup>. The *Schrems* Cases reveal that authorisation decisions for the cross-border commercial use of data is as much a closed-door political decision as a legal one. Such a politicisation erodes the efficacy of the EU legal framework to prevent undue infringement on the rights of data subjects and transforms the framework into a reactive one which response to legal challenges by protectionist movements.

The second concern is what Spina recognises as the progressive “Riskification” of the EU data

protection framework<sup>373</sup>. This is the shift of the legal approach to data protectionism from a limited legal regulation model to one based on “enforced self-regulation for managing technological innovation in uncertain scenarios”<sup>374</sup>. Spina further argues that such self-regulation will take place through varying governance measures, ranging from data protection impact assessments to the introduction of default data protection mechanisms into the commercial processing of user data<sup>375</sup>. Macenaite supports Spina’s argument by noting that the GDPR “relies heavily on risk” and has introduced a considerable number of new provisions around risk regulation<sup>376</sup>. Whilst risk regulation is one avenue for bridging the gap created by the disproportionate development of technology in comparison to the parallel development in the law on technology, heavy reliance on sectoral self-regulation (as seen in the USA) is counterproductive as data controllers who benefit by big data analysis, decide the nature and extent of the commercial processing of user data.

The third concern is the complexity and ambiguity of the composition and impact of the GDPR. Cool notes in an article in The New York Times, that the “staggering complexity” of the GDPR; which received 4000 amendment proposals since a draft was submitted by the European Parliament, is attributable to differences in national values on data collection<sup>377</sup>. Undoubtedly, this creates practical costs for businesses, as they must invest in expensive internal frameworks and additional processes for data protection. Though the EU legal framework cannot be simplified due to the versatile nature of personal data and growth in cross-border commercial processing, greater clarity can be achieved through the streamlining of such legal

<sup>370</sup> *ibid.*

<sup>371</sup> C-311/18 *Data Protection Commissioner v Facebook Ireland and Maximillian Schrems* [2020].

<sup>372</sup> Foo Yun Chee, ‘New EU-U.S. data transfer pact? Not any time soon, says EU privacy watchdog’ (Online 4 December 2020) <<https://www.reuters.com/article/eu-privacy-idUSKBN28E2JQ>> accessed 15 April 2021.

<sup>373</sup> Alessandro Spina, ‘A Regulatory Mariage de Figaro: Rica Ethics’ (2017) 8 *European Journal of Risk Regulation* 88.

<sup>374</sup> *ibid.*

<sup>375</sup> *ibid.*

<sup>376</sup> Milda MACENAITE, ‘The “Riskification” of European Data Protection Law through a two-fold Shift’ (2017) <<https://www.cambridge.org/core/journals/european-journal-of-risk-regulation/article/riskification-of-european-data-protection-law-through-a-twofold-shift/A91B3E7A0A1EF4E6889FD54F941D83D3>> accessed 24 April 2021

<sup>377</sup> Alison Cool ‘Europe’s Data Protection Law Is a Big, Confusing Mess’ (USA 15 May 2018) <<https://www.nytimes.com/2018/05/15/opinion/gdpr-europe-data-protection.html>> accessed 4 April 2021.

systems and via greater investment in support systems provided to commercial data controllers.

## CONCLUSION

The key legal implication of the commercial use of personal data is the dual role served by the law as a facilitator of lawful cross-border transfer of such data within the digital economy, and as a champion of the right to privacy and protection from unlawful processing of user data. On the surface, these two roles may appear contradictory to one another, as data protectionism hinders the freedom of user data markets. However, for the growth and sustenance of transnational commercial use of personal data, data subjects (consumers and users) must have trust in firms operating as data controllers and confidence in the legal regulatory framework on data protectionism. Therefore, this dual role of the law is essential for the existence of safe international user data markets and increased commercial processing of such data for economic activities.

In order to maintain this tricky balancing act of the law, national and global legislatures adopt varying legal frameworks based on, subjective philosophies to data regulation and existing local privacy rights cultures. A local example of such a Though local user data control mechanisms are a positive step towards safe commercial use of personal data, they obstruct the global flow of data due to the varying regulations requirements and often bureaucratic processes imposed. The difference in the EU's legal approach to internal market, commercial processing of personal data and the data exportation outside of the EEA, which are set out in the GDPR, is proof of the difficulties that arise out of the lack of uniformity in global data regulation. This is why an international convention on the control of commercial use of personal data, which is proposed by academics and practitioners alike, is a viable option. However, such an international law framework must be one based on a philosophy of necessary protectionism, as opposed to the present human rights biased culture of the global political arena.

## BIBLIOGRAPHY

- Barlow, J. (2019). The Economy of Ideas: Selling Wine without Bottles on the Global Net. *Duke Law & Technology Review*, 8-31
- Bu-Pasha, S. (2017) Cross-border issues under EU data protection law with regards to personal data protection. *Information and Communications Technology Law*, 26(3), 213-228.  
<https://www.tandfonline.com/doi/full/10.1080/13600834.2017.13307402>
- C-311/18 Data Protection Commissioner v Facebook Ireland and Maximillian Schrems [2020]
- C-311/18 *Data Protection Commissioner v Facebook Ireland and Maximillian Schrems* [2020]
- Case C-101/01 *Criminal Proceedings Against Bodil Lindqvist* [2003] ECR I-12971
- Case C-362/14. *Maximillian Schrems v Data Protection Commissioner* [2015] ECLI:EU:C:2015:650
- Chee, F.Y. 'New EU-U.S. data transfer pact? Not any time soon, says EU privacy watchdog' (Online 4 December 2020) <<https://www.reuters.com/article/eu-privacy-idUSKBN28E2JQ>> accessed 15 April 2021
- Cool, A. (2018, May 15). Europe's Data Protection Law Is a Big, Confusing Mess. *New York Times*.  
<https://www.nytimes.com/2018/05/15/opinion/gdpr-europe-data-protection.html>>
- Cool, A. 'Europe's Data Protection Law Is a Big, Confusing Mess' (USA 15 May 2018) <<https://www.nytimes.com/2018/05/15/opinion/gdpr-europe-data-protection.html>> accessed 4 April 2021
- Macenaite, M. (2017). The "Riskification" of European Data Protection Law through a two-fold Shift. *European Journal of Risk Regulation*, 8(3), 506 – 540.  
<https://www.cambridge.org/core/journals/european-journal-of-risk-regulation/article/riskification-of-european-data-protection-law-through-a-twofold->

shift/A91B3E7A0A1EF4E6889FD54F941D8  
3D3

Macenaite, M. 'The "Riskification" of European Data Protection Law through a two-fold Shift' (2017) <  
<https://www.cambridge.org/core/journals/european-journal-of-risk-regulation/article/riskification-of-european-data-protection-law-through-a-twofold-shift/A91B3E7A0A1EF4E6889FD54F941D83D3>> accessed 24 April 2021

Movius, L. and Krup, N. (2009) U.S. and EU Privacy Policy: Comparison of Regulatory Approaches. *International Journal of Communication*, 169-187

Sands, M. 'Customer Data Is The Secret To Silicon Valley's Success' *Forbes* (USA 29 November 2017) <  
<https://www.forbes.com/sites/mikesands1/2017/11/29/customer-data-is-the-secret-to-silicon-valleys-success/#135386886c3b>> accessed 26 March 2021

Spina, A. 'A Regulatory Mariage de Figaro: Rica Ethics' (2017) 8 *European Journal of Risk Regulation* 88.

Stepanov, I. (2019). Introducing a property right over data in the EU: the data producer's right – an evaluation. *International Review of Law, Computers & Technology*, 65-86



# **Mathematics and Statistics**



## Reference Ranges and Control Limits that are Resistant to Baseline Outliers

Dhammika Amaratunga<sup>\*1</sup>

<sup>1\*</sup>Princeton Data Analytics, USA

### ARTICLE INFO

#### Article History:

Received Date: 01 July 2022

Accepted Date: 15 September 2022

#### Keywords:

Robust statistics; M-estimation; Quality control

#### Citation:

Dhammika Amaratunga. (2022). *Reference Ranges and Control Limits that are Resistant to Baseline Outliers*. Proceedings of SLIIT International Conference on Advancements in Sciences and Humanities, (11) October, Colombo, 183 - 188.

### ABSTRACT

Reference ranges and control limits are used in many settings – for example, to assess a person's health or to monitor the stability of a manufacturing process. Such ranges are established based on a baseline sample of what is considered normal data, but it is not possible to always avoid a few outliers being present even in this sample. If, as is common, the range is calculated using statistics, such as the mean and standard deviation, which could be influenced by outliers, then the use of such a range could adversely affect the decisions made. This can be avoided by constructing the reference range using statistics that are resistant to outliers. In this paper, we demonstrate the superior performance of such an approach.

<sup>\*</sup> Dhammika, damaratung@yahoo.com

## INTRODUCTION

Reference ranges and control limits are used in various settings. In medicine, a reference range (often also called a normal range) is an interval of values that is deemed normal for a healthy person; a value outside the reference range limits could indicate a potential health issue. In manufacturing, control limits define the acceptable range of results for a process; a value outside the control limits could be indicating that the process being monitored is out of control. In agriculture, control limits have been used to monitor harvest yields. In environmental studies, control limits have been used to monitor air pollution levels.

In general, a laboratory or a manufacturer will establish a reference range for a variable by testing a random sample of individuals from the “normal” population (we will refer to this sample as the “baseline”) and then using these baseline values to derive an interval that will contain, on average, a large percentage (say  $b$ , usually  $b=95\%$  or  $99\%$ ) of test results of the “normal” “healthy” population (hereafter called the “typical values”). Such  $b$ -level reference ranges are usually constructed using the mean,  $\bar{x}$ , and standard deviation,  $s$ , of the baseline values. Some references for estimation procedures are Harris and Boyd (1995), Amaratunga (1997), Linnet (2000) and Wright and Royston (1999).

In practice it is difficult to totally avoid a few atypical values or outliers being present in the baseline sample used to construct a reference range. If that happens, then this can affect the development of the reference range if it was constructed using statistics such as the mean and standard deviation which can be unduly affected by outliers. In such situations, it is useful to consider reference ranges constructed using statistics that are resistant to sampling from contaminated distributions. The value of considering such approaches in data analysis in general was pointed out by Tukey (1960), in what is regarded as the seminal paper on robust statistics. In this paper, we will study some possible approaches for this particular problem – the construction of reference ranges.

## MATERIALS AND METHODS

The primary purpose of a reference range is to identify atypical values. Taking  $f(\cdot)$  to be the probability distribution function of the typical

values and by taking  $x$  as a new observation, if an interval  $\hat{I} = (a, b)$  is to be used as a reference range, it would clearly be desirable for  $\hat{I}$  to be such that  $\text{Prob}(x \in \hat{I}) = \int_a^b f(x)dx$  is large if  $x$  is a typical value and small if  $x$  is an atypical value. Hence, we use the “positive rate”,  $PR = 1 - E[\int_a^b f(x)dx]$ , as a statistic to assess the performance of potential reference ranges.  $PR$  would be small for typical values and large for atypical values.

We explore five methods (labeled RR1 to RR5) for computing reference ranges.

First, we will assume that the typical values are Normally distributed or have been transformed to Normality, i.e., they have a  $N(m, s^2)$  distribution, while atypical values are such that they have a  $N(m+D, s^2)$  distribution where  $D \neq 0$ . In this case, it is natural to seek a reference range of the form:  $\hat{I}_k = (\bar{x} \pm ks)$ . Large values of  $k$  will result in small values of  $PR$  if  $D=0$  and large values of  $PR$  if  $D \neq 0$ ; in fact, the value of  $PR$  will increase monotonically with  $D$ . Making  $k$  too small will result in too many atypical values being judged typical while making  $k$  too large will result in the opposite. In order to balance this, we could choose  $k$  to be such that  $PR=b$  for a reasonable value of  $b$  when  $D=0$ . This produces a  $b$ -expectation tolerance interval and, as it turns out, also a  $b$ -level prediction interval (Guttman, 1970). The corresponding value of  $k$  is  $k = t_{((1-b/2), (n-1))} \sqrt{(1+1/n)}$ , where  $t_{\alpha, n}$  denotes the  $\alpha$ -th quantile of a  $t$  distribution with  $n$  degrees of freedom (Wilks, 1941). We call this reference range RR1.

Since both  $\bar{x}$  and  $s$  can be influenced by outliers, we can replace them in RR1 by the Median and MAD (median absolute deviation) respectively since they are highly resistant to outliers. This is reference range RR2. A drawback however is that the Median and MAD have low efficiency at the Normal if the baseline sample size is small.

Another possibility to avoid the reference range being overly influenced by baseline outliers is to use a robust method. Robust estimates strive to provide good efficiency at the nominal Normal distribution as well as resistance to outliers. Horn et al (1998) suggested using M-estimates and showed that doing this, besides providing resistance to outliers, also protects against imperfect transformations to Normality. Here we use MM-estimation, an extension of M-estimation,

that has somewhat better performance (Yohai, 1987). This is reference range RR3.

A common exploratory approach for detection and management of outliers is to run an outlier test and to eliminate any outliers found. For example, we could calculate standardized residuals using the median,  $M$ , and MAD, i.e., calculate  $u_i = (x_i - M)/MAD$ , and designate as outliers any values whose  $u_i > k$ , where  $k$  is the value used in method RR1. However, instead of eliminating such values, which could lead to bias, we can instead set such values equal to the cutoff,  $k$ . We can then use method RR1 on the “cleaned-up” data as it now will not contain any outliers. This is reference range RR4.

In the event that Normality or a transformation to Normality is not tenable, nonparametric reference ranges of the form  $\hat{I}_r = (x_{(r)}, x_{(n-r+1)})$ , where  $x_{(r)}$  denotes the  $r$ th order statistic ( $r < n/2$ ), can be considered. Setting  $r$  small (i.e., setting the limits of the reference range close to the sample extremes) will result in small values of  $PR$  if  $D=0$ , but could also result in small values of  $PR$  if  $D \neq 0$ . In analogy with the discussion related to method RR1, it seems best to select  $r$  to be as large as possible but with  $PR$  set to its prespecified value of  $b$  when  $D=0$ . This is obtained by setting  $h=(n+1)(1-b)/2$  (Guttman, 1970) and, if  $h$  is an integer, letting  $r=h$ . If  $h$  is not an integer and  $h=s+f$ , where  $s$  is its integer part and  $f$  is its fractional part, the left endpoint of  $\hat{I}$  is determined by linearly interpolating between the  $s$ th and  $(s+1)$ th order statistics:  $(1-f)x_{(s)} + fx_{(s+1)}$ , with the right endpoint of  $\hat{I}$  determined analogously (Hall and Rieck, 1991). This is reference range RR5.

Note that g-content b-level tolerance intervals have been suggested in the literature for use as reference ranges (Liu et al, 2021). However, such intervals will be too wide (unless  $g$  and/or  $b$  are set low) and many atypical values could be missed. In addition, b-level prediction intervals are directly consistent with the objective of constructing an interval  $I$  such that a fresh random observation from the baseline distribution falls into  $I$  with a specific probability. Hence only such intervals were considered.

## RESULTS AND DISCUSSION

We ran a series of simulations to compare the above 5 reference range construction methods. The simulations were carried out as follows. A

sample  $\{z_i\}$  of size  $n$  was drawn from a  $N(0,1)$  distribution and a sample  $\{d_i\}$  of size  $n$  was drawn from a Bernoulli( $p_0$ ) distribution. Then we set  $x_i = z_i + D_0 d_i$ . Here  $p_0$  and  $D_0$  are respectively the probability and mean shift of an atypical value in the baseline sample. Reference ranges were calculated using each of the methods, RR1 to RR5. The probability,  $p(D; n, p_0, D_0)$ , of an observation from a  $N(m+D, s^2)$  distribution being declared atypical was calculated for several different values of  $D$  using methods RR1 to RR5 with  $b=95\%$ . This was repeated 500 times and the mean,  $PR(D; n, p_0, D_0)$ , and standard deviation,  $SDPR(D; n, p_0, D_0)$ , of the  $p(D; n, p_0, D_0)$  values were recorded.

The above simulation was carried out for several different values of  $n$ ,  $p_0$ ,  $D_0$  and  $D$ . Table 1a shows the results for situations in which the baseline sample does not contain any atypical values, so that  $p_0=D_0=0$ . Simulation results are reported for  $n=10, 30, 50$ ; and  $D=0, 1, 3, 5$ . Note that the  $PR$  when  $D=0$  is an estimate of the false positive rate (FPR) of the method. Table 1b shows the results for situations in which the baseline sample contains on average 10% atypical values (i.e.,  $p_0=0.1$ ) with mean 3 (i.e.,  $D_0=3$ ). Here, too, simulation results are reported for  $n=10, 30, 50$ ; and  $D=0, 1, 3, 5$ .

RR1 performed well when there were no atypical values in the baseline data; i.e., when  $(p_0, D_0)=(0,0)$ . Its FPR was at the nominal rate of 5% as desired and it had high  $PR$  when atypical values were present. The robust methods RR3 and RR4 also had FPR close to 5% and as high  $PR$  as RR1 when atypical values were present. However, RR2 had a somewhat higher FPR when the sample size was small and it had a higher variability than all the other methods due to the lower efficiency of the Median and MAD. RR5 also had a FPR that was too high at small sample sizes.

When there were atypical values in the baseline data, the performance of RR1 deteriorated substantially, both in terms of FPR and its ability to detect atypical values when they were present. RR5 also had overall weak performance in this case. The methods based on resistant statistics, RR2, RR3 and RR4, all performed well except that RR2 had somewhat high FPR and variability.

## CONCLUSIONS

We considered 5 methods for constructing reference ranges and compared their performance both in the absence as well as in the presence of atypical values in the sample on which the ranges were based. While the conventional method for constructing reference ranges based on mean and standard deviation worked well when there were no atypical values, its performance deteriorated when there were some. On the other hand, methods based on robust statistics performed well in both situations. Therefore, we recommend using a robust approach, in particular either RR3 or RR4, when constructing reference ranges.

## REFERENCES

- Amaratunga, D. (1997). Reference ranges for screening preclinical drug safety data, *Journal of Biopharmaceutical Statistics*, 7, 417-422.
- Guttman, I. (1970) Construction of  $\beta$ -Content Tolerance Regions at Confidence Level  $\gamma$  for Large Samples from the k-Variate Normal Distribution. *Annals of Mathematical Statistics*, 41, 376-400.
- Hall, P. and Rieck, A. (2001) Improving coverage accuracy of nonparametric prediction intervals. *Journal of the Royal Statistical Society, Series B*, 63, 717-726.
- Harris, E. K. and Boyd, J. C. (1995). *Statistical bases of reference values in laboratory medicine*. New York: Marcel Dekker.
- Horn, P. S., Peace, A.J., and Copeland, B.E. (1998) A robust approach to reference interval estimation and evaluation. *Clinical Chemistry*, 44, 622-631.
- Linnet, K. (2000) Nonparametric estimation of reference intervals by simple and bootstrap-based procedures. *Clinical Chemistry*, 46, 867-869.
- Liu, W., Bretz, F., and Cortina-Borja, M. (2021). Reference range: which statistical intervals to use? *Statistical Methods in Medical Research*, 30, 523-534.
- Wilks, S. S. (1941). Determination of sample sizes for setting tolerance limits, *Annals of Mathematical Statistics*, 12, 91-96
- Wright, E. M. and Royston, P. (1999) Calculating reference intervals for laboratory measurements, *Statistical Methods in Medical Research*, 8, 93-112.
- Tukey, J. W. (1960). A survey of sampling from contaminated distributions. In Contributions to Probability and Statistics. Essays in Honor of Harold Hotelling (I. Olkin et al., eds.), 448-485. Stanford University Press.
- Yohai, V. J. (1987). High breakdown point and high efficiency robust estimates for regression. *Annals of Statistics*, 15, 642-656.

**Table 1:**

Table 1a shows the simulation results for situations in which the baseline sample does not contain any atypical values, so that  $p_0=D_0=0$ . Table 1b shows the simulation results for situations in which the baseline sample contains on average 10% atypical values (i.e.,  $p_0=0.1$ ) with mean 3 (i.e.,  $D_0=3$ ).

Table 1a Prob(Atypical values in baseline sample)=0%					
	Mean $p_0=0$ $\Delta_0=0$ $\Delta=0$	SD $p_0=0$ $\Delta_0=0$ $\Delta=0$	Mean $p_0=0$ $\Delta_0=0$ $\Delta=1$	Mean $p_0=0$ $\Delta_0=0$ $\Delta=3$	Mean $p_0=0$ $\Delta_0=0$ $\Delta=5$
<i>N</i> =10					
RR1	0.048	0.062	0.131	0.382	0.703
RR2	0.096	0.128	0.194	0.438	0.711
RR3	0.065	0.096	0.150	0.385	0.674
RR4	0.064	0.086	0.161	0.420	0.725
RR5	0.173	0.113	0.325	0.648	0.893
<i>N</i> =30					
RR1	0.048	0.030	0.154	0.468	0.807
RR2	0.069	0.059	0.179	0.490	0.808
RR3	0.056	0.045	0.163	0.474	0.804
RR4	0.060	0.041	0.179	0.504	0.827
RR5	0.066	0.044	0.179	0.490	0.810
<i>N</i> =50					
RR1	0.050	0.024	0.163	0.492	0.829
RR2	0.063	0.047	0.181	0.505	0.827
RR3	0.055	0.035	0.170	0.496	0.827
RR4	0.062	0.033	0.187	0.526	0.848
RR5	0.058	0.031	0.172	0.496	0.824

Table 1b  
 Prob(Atypical values in baseline sample)=10%

	Mean $p_0=0.1$ $\Delta_0=3$ $\Delta=0$	SD $p_0=0.1$ $\Delta_0=3$ $\Delta=0$	Mean $p_0=0.1$ $\Delta_0=3$ $\Delta=1$	Mean $p_0=0.1$ $\Delta_0=3$ $\Delta=3$	Mean $p_0=0.1$ $\Delta_0=3$ $\Delta=5$
<i>N</i> =10					
RR1	0.027	<i>0.049</i>	0.067	0.210	0.447
RR2	0.073	<i>0.102</i>	0.144	0.360	0.631
RR3	0.046	<i>0.077</i>	0.104	0.289	0.553
RR4	0.040	<i>0.062</i>	0.096	0.277	0.542
RR5	0.143	<i>0.110</i>	0.167	0.358	0.604
<i>N</i> =30					
RR1	0.016	<i>0.017</i>	0.042	0.193	0.498
RR2	0.040	<i>0.046</i>	0.103	0.345	0.678
RR3	0.032	<i>0.034</i>	0.088	0.314	0.652
RR4	0.029	<i>0.027</i>	0.077	0.292	0.629
RR5	0.036	<i>0.032</i>	0.034	0.131	0.349
<i>N</i> =50					
RR1	0.014	<i>0.013</i>	0.035	0.182	0.500
RR2	0.036	<i>0.031</i>	0.100	0.351	0.698
RR3	0.031	<i>0.023</i>	0.087	0.328	0.680
RR4	0.029	<i>0.021</i>	0.077	0.303	0.654
RR5	0.034	<i>0.025</i>	0.016	0.081	0.283



## Convergence of Gradient Methods with Deterministic and Bounded Noise

Hansi Abeynanda<sup>1\*</sup>, G. H. Jayantha Lanel<sup>2</sup>

<sup>1</sup>Sri Lanka Institute of Information Technology

<sup>2</sup>University of Sri Jayewardenepura

### ARTICLE INFO

#### Article History:

Received Date: 01 July 2022

Accepted Date: 15 September 2022

#### Keywords:

The gradient method; deterministic and bounded noise; distributed optimization; dual decomposition

#### Citation:

Hansi Abeynanda, G. H. Jayantha Lanel. (2022). *Convergence of Gradient Methods with Deterministic and Bounded Noise*. Proceedings of SLIIT International Conference on Advancements in Sciences and Humanities, (11) October, Colombo, 189 - 195.

### ABSTRACT

In this paper, we analyse the effects of noise on the gradient methods for solving a convex unconstrained optimization problem. Assuming that the objective function is with Lipschitz continuous gradients, we analyse the convergence properties of the gradient method when the noise is deterministic and bounded. Our theoretical results show that the gradient algorithm converges to the related optimality within some tolerance, where the tolerance depends on the underlying noise, step size, and the gradient Lipschitz continuity constant of the underlying objective function. Moreover, we consider an application of distributed optimization, where the objective function is a sum of two strongly convex functions. Then the related convergences are discussed based on dual decomposition together with gradient methods, where the associated noise is considered as a consequence of quantization errors. Finally, the theoretical results are verified using numerical experiments.

\* Hansi, kavindika.a@sliit.lk



## INTRODUCTION

Mathematical optimization is an important process that determines the best possible solution corresponding to the best performance of a quantitatively well-defined system. The related theory is frequently used in many application domains such as machine learning, signal processing, data analysis and modelling, statistics, etc. In general, these large-scaled networked systems consist of a large number of subsystems that operate together to achieve a common goal. In particular, the distributed optimization methods, which enable solving a global problem collectively with many subsystems play an important role in the operation of these large-scale distributed systems. With the existing large set of data volumes in modern systems, the currently used most well-known distributed methods are the first order methods such as gradient/subgradient methods (Nedić & Bertsekas, 2010; Nedić & Ozdaglar, 2009; Nedić, Olshevsky, Ozdaglar, & Tsitsiklis, 2008). However, in the real world applications, the large-scaled distributed systems have to face many barriers when their subsystems make local decisions and exchange information to accomplish their tasks. The main bottleneck arises with communications among subsystems in terms of bandwidth limitations. Moreover, challenges such as computational errors and measurement errors (Abeynanda & Lanel, 2021) are also affecting the operation of distributed systems. Thus, in the real world applications, it prevents the application of distributed methods in the pure form. Consequently, the analysis of distributed methods over inexact settings has received much attention in many application fields.

The subgradient/gradient methods with noise were studied many years back in (Polyak, 1987; Bertsekas & Tsitsiklis, 1999; Solodov & Zavriev, 1998). Authors (Bertsekas & Tsitsiklis, 1999) have discussed the convergence properties of inexact gradient methods using the diminishing step size rule and bounded errors. The bound on the errors depends on the current step size selection, and therefore the diminishing step size conditions lead to diminishing errors which are not realistic in many real life situations. The study by (Solodov & Zavriev, 1998) has focused their work only using a compact constraint set and has shown their results only using the diminishing step size

rule. Recent works (Pu, Zeilinger, & Jones, 2017; Michelusi, Scutari, & Lee, 2018; Magnússon, Shokri-Ghadikolaei, & Li, 2020) have studied the effect of imperfect communication over distributed methods using diminishing errors. However, diminishing errors impose restrictions in many real life applications (measurement errors are persistent). Thus, the study of convergence properties of gradient methods with persistent and bounded errors is an important area of the study which requires further development. Motivated by this, the main focus of this study is to analyse the gradient methods with persistent and bounded errors. More importantly, we explicitly provide a novel convergence proof for the gradient method with bounded noise. More specifically, the main objectives of this study are as follows.

1. Analyse the convergence properties of the gradient method with deterministic and bounded errors using a convex unconstrained optimization problem (see Proposition 1).
2. Solve a problem of minimizing a sum of two strongly convex objective functions with a common decision variable using dual decomposition.
3. Verify the theoretical results using numerical experiments.

## MATERIALS AND METHODS

This section is organized as follows. First, we present the notation and important definitions used in this study. Next, we introduce the main problem considered in this paper together with related assumptions. Finally, the gradient algorithm with inexact gradients is discussed.

### Notation and Definitions

We use the following notation and definitions that are frequently referenced in our study.

We use  $\mathbb{R}$ ,  $\mathbb{R}^n$ ,  $\mathbb{Z}_0^+$ , and  $\mathbb{R}^{n \times m}$  to denote the set of real numbers, set of real  $n$ -vectors, set of nonnegative integers, and set of real  $n \times m$  matrices, respectively. For  $x \in \mathbb{R}^n$ ,  $x^T$  and  $\|x\|$  denote the transpose of  $x$  and  $l_2$ -norm, respectively. The asymptotic notation “Big oh” is denoted by  $O(\cdot)$ .

**Definition 1 (Gradient Lipschitz Continuity):**

A differentiable function  $f: \mathbb{R}^n \rightarrow \mathbb{R}$  is said to have a Lipschitz continuous gradient on  $C \subseteq \text{dom } f$ , if there exists  $L > 0$  such that

$$\|\nabla f(x) - \nabla f(y)\| \leq L\|x - y\|, \text{ for all } x, y \in C, \quad (1)$$

where  $L$  is called the gradient Lipschitz continuous constant of  $f$ .

**Definition 2 (Strongly Convex Function):** A differentiable function  $f: \mathbb{R}^n \rightarrow \mathbb{R}$  is strongly convex on  $C \subseteq \text{dom } f$ , if there exists  $\mu > 0$  such that

$$f(tx + (1-t)y) \leq tf(x) + (1-t)f(y) - \frac{1}{2}\mu t(1-t)\|x - y\|^2, \text{ for all } x, y \in C, \text{ when } 0 < \mu < 1, \quad (2)$$

where  $\mu$  is called the strong convexity constant of  $f$ .

**Problem Formulation and related assumptions**

In this paper, we consider the following unconstrained optimization problem:

$$\underset{x \in \mathbb{R}^n}{\text{minimize}} \ g(x), \quad (3)$$

where the function  $g: \mathbb{R}^n \rightarrow \mathbb{R}$  is convex, differentiable, and has a finite minimizer. We let  $X^*$  as the set of optimal solutions to the problem (3) and  $g^*$  as the optimal value. The following assumption is made on the objective function  $g$ .

**Assumption 1:** The gradient  $\nabla g$  is Lipschitz continuous with constant  $L$  (See Definition 1).

**Assumption 2:** The gradients of  $g$  are bounded. I.e, there exists  $M > 0$ , s.t.  $\|\nabla g(x^k)\| \leq M$  for all  $k$ .

**The Gradient Method with Noise**

We solve the problem (3) using the following gradient method with noise:

$$x^{k+1} = x^k - \alpha_k \widehat{\nabla} g(x^k), \quad (4)$$

where  $\widehat{\nabla} g(x^k) = \nabla g(x^k) + r^k$ ,  $k$  denotes the iteration index, and  $\alpha_k$  represents the step size at  $k$ th iteration. Here  $r^k$  denotes the noise imposed on the system due to the inexactness of the gradient information  $\nabla g(x^k)$  at the  $k$ th iteration. The inexactness of the gradient can be caused due to numerous errors such as computational errors, quantization errors, etc. We made the following assumption on  $r^k$ .

**Assumption 3:** The error term  $r^k$  is deterministic and bounded, i.e., there exists  $\epsilon > 0$ , s.t.  $\|r^k\| < \epsilon$  for all  $k$ .

Here, it is worth noting that the error term  $r^k$  is deterministic means that  $r^k$  is not random, i.e.,  $r^k$  is not achieved through a stochastic process, e.g., computational errors due to roundoff in arithmetic operations on a computer are deterministic (Polyak, 1987, Section 4.1).

**RESULTS AND DISCUSSION**

In this section, we discuss the convergence properties of the method (4). First, we will present the following Lemma, which will then use to prove the convergence results.

**Lemma 1:** Let Assumptions 1, 2, and 3 hold. Then, in method (4) we have

$$g(x^{k+1}) \leq g(x^k) - \alpha_k \left(1 - \frac{\alpha_k L}{2}\right) \|\nabla g(x^k)\|^2 + |\alpha_k - \alpha_k^2 L| M \epsilon + \frac{\alpha_k^2 L}{2} \epsilon^2$$

**Proof:** Let  $x, y \in \mathbb{R}^n$ . Since  $g$  is differentiable at  $x$ , the first order linear approximation at  $x$  is given by

$$g(x + y) = g(x) + \nabla g(x)^T y + \int_0^1 [\nabla g(x + \tau y) - \nabla g(x)]^T y d\tau, \quad (5)$$

where the integral part represents the remainder term (Polyak, 1987). We let  $x = x^k$  and  $y = -\alpha_k s^k$ , where  $s^k = \nabla g(x^k) + r^k$ . Then (5) yields

$$g(x^k - \alpha_k s^k) = g(x^k) - \alpha_k \nabla g(x^k)^T s^k - \alpha_k \int_0^1 [\nabla g(x^k - \alpha_k \tau s^k) - \nabla g(x^k)]^T s^k d\tau$$

Thus,

$$g(x^{k+1}) \leq g(x^k) - \alpha_k \nabla g(x^k)^T s^k + \alpha_k \int_0^1 \|\nabla g(x^k - \alpha_k \tau s^k) - \nabla g(x^k)\| \|s^k\| d\tau \quad (6)$$

$$\leq g(x^k) - \alpha_k \nabla g(x^k)^T s^k + \alpha_k L \|s^k\| \int_0^1 \|x^k - \alpha_k \tau s^k - x^k\| d\tau \quad (7)$$

$$= g(x^k) - \alpha_k \nabla g(x^k)^T s^k + \alpha_k^2 L \|s^k\|^2 \int_0^1 \tau d\tau \quad (8)$$

$$= g(x^k) - \alpha_k \nabla g(x^k)^T s^k + \frac{\alpha_k^2 L}{2} \|s^k\|^2 \quad (9)$$

$$= g(x^k) - \alpha_k \|\nabla g(x^k)\|^2 - \alpha_k \nabla g(x^k)^T r^k + \frac{\alpha_k^2 L}{2} (\|\nabla g(x^k)\|^2 + 2 \nabla g(x^k)^T r^k + \|r^k\|^2) \quad (10)$$

$$= g(x^k) - \alpha_k \left(1 - \frac{\alpha_k L}{2}\right) \|\nabla g(x^k)\|^2 - (\alpha_k - \alpha_k^2 L) \nabla g(x^k)^T r^k + \frac{\alpha_k^2 L}{2} \|r^k\|^2 \quad (11)$$

$$\leq g(x^k) - \alpha_k \left(1 - \frac{\alpha_k L}{2}\right) \|\nabla g(x^k)\|^2 + |\alpha_k - \alpha_k^2 L| \|\nabla g(x^k)\| \|r^k\| + \frac{\alpha_k^2 L}{2} \|r^k\|^2 \quad (12)$$

$$\leq g(x^k) - \alpha_k \left(1 - \frac{\alpha_k L}{2}\right) \|\nabla g(x^k)\|^2 + |\alpha_k - \alpha_k^2 L| M\epsilon + \frac{\alpha_k^2 L}{2} \epsilon^2, \quad (13)$$

where (6) follows using (4) and from Cauchy-Schwarz inequality, (7) follows using Assumption 1, (8), (9), (10), and (11) follow using simplifications, (12) follows again from Cauchy-Schwarz inequality and from that  $-x \leq |x|$  for any  $x \in \mathbb{R}$  and, finally, (13) follows using Assumptions 2 and 3.

Next, the convergence of the gradient method (4) is established concerning the norm of the gradients. In particular, we show that  $\min_{i \in \{0, \dots, k\}} \|\nabla g(x^i)\|$  converges to 0 with some tolerance. The convergence proof is provided using the constant step size rule. However, it is worth noting that other variations of different step size rules such as square summable but not summable and nonsummable diminishing (Boyd S., 2014, pp. 4-5) or improved step size schedules (Khirirat, Wang, Magnússon, & Johansson, 2021) can also be considered for related results which require further investigations.

**Proposition 1:** Suppose Assumptions 1, 2, and 3 hold. Let  $\alpha_k = \alpha$  for all  $k \in \mathbb{Z}_0^+$  with  $0 < \alpha < 2/L$ . Then

$$\min_{i \in \{0, \dots, k\}} \|\nabla g(x^i)\| \leq \sqrt{\frac{M\epsilon|1-\alpha L| + \frac{\alpha L}{2}\epsilon^2}{(1-\frac{\alpha L}{2})}}.$$

**Proof:** Let  $\alpha_k = \alpha$ . Then with the recursive application of Equation (13) we get

$$g(x^{k+1}) \leq g(x^0) - \sum_{i=0}^k \alpha \left(1 - \frac{\alpha L}{2}\right) \|\nabla g(x^i)\|^2 + M\epsilon \sum_{i=0}^k |\alpha - \alpha^2 L| + \sum_{i=0}^k \frac{\alpha^2 L}{2} \epsilon^2. \quad (14)$$

Next, by rearranging the terms in (14) we get

$$\sum_{i=0}^k \alpha \left(1 - \frac{\alpha L}{2}\right) \|\nabla g(x^i)\|^2 \leq g(x^0) - g(x^{k+1}) + M\epsilon \sum_{i=0}^k |\alpha - \alpha^2 L| + \sum_{i=0}^k \frac{\alpha^2 L}{2} \epsilon^2$$

$$\leq g(x^0) - g(x^*) + M\epsilon \sum_{i=0}^k |\alpha - \alpha^2 L| + \sum_{i=0}^k \frac{\alpha^2 L}{2} \epsilon^2, \quad (15)$$

Where (15) follows using that  $g(x^*) \leq g(x), \forall x$  (recall that  $g$  is convex).

Then, since  $\min_{i \in \{0, \dots, k\}} \|\nabla g(x^i)\|^2 \leq \|\nabla g(x^i)\|^2$ , from (15) we get

$$\min_{i \in \{0, \dots, k\}} \|\nabla g(x^i)\|^2 \sum_{i=0}^k \alpha \left(1 - \frac{\alpha L}{2}\right) \leq g(x^0) - g(x^*) + M\epsilon \sum_{i=0}^k |\alpha - \alpha^2 L| + \sum_{i=0}^k \frac{\alpha^2 L}{2} \epsilon^2. \quad (16)$$

Finally we get

$$\begin{aligned} \min_{i \in \{0, \dots, k\}} \|\nabla g(x^i)\|^2 &\leq \frac{g(x^0) - g(x^*) + M\epsilon \sum_{i=0}^k |\alpha - \alpha^2 L| + \sum_{i=0}^k \frac{\alpha^2 L}{2} \epsilon^2}{\sum_{i=0}^k \alpha \left(1 - \frac{\alpha L}{2}\right)} \\ &\leq \frac{g(x^0) - g(x^*)}{\alpha \left(1 - \frac{\alpha L}{2}\right)(k+1)} + \frac{M\epsilon |\alpha - \alpha^2 L| + \frac{\alpha^2 L}{2} \epsilon^2}{\alpha \left(1 - \frac{\alpha L}{2}\right)}. \end{aligned} \quad (17)$$

Then, since  $\min_{i \in \{0, \dots, k\}} \|\nabla g(x^i)\|^2 = \left(\min_{i \in \{0, \dots, k\}} \|\nabla g(x^i)\|\right)^2$ , (17) implies

$$\begin{aligned} \min_{i \in \{0, \dots, k\}} \|\nabla g(x^i)\| &\leq \sqrt{\frac{g(x^0) - g(x^*)}{\alpha \left(1 - \frac{\alpha L}{2}\right)(k+1)} + \frac{M\epsilon |\alpha - \alpha^2 L| + \frac{\alpha^2 L}{2} \epsilon^2}{\alpha \left(1 - \frac{\alpha L}{2}\right)}} \\ &\leq \sqrt{\frac{g(x^0) - g(x^*)}{\alpha \left(1 - \frac{\alpha L}{2}\right)(k+1)}} + \sqrt{\frac{M\epsilon |1 - \alpha L| + \frac{\alpha L}{2} \epsilon^2}{\left(1 - \frac{\alpha L}{2}\right)}}. \end{aligned} \quad (18)$$

Thus, the Proposition 1 follows from (18), because  $1/(k+1) \rightarrow 0$  as  $k \rightarrow \infty$ .

## An Application with Numerical Results

We consider a system of two users who collectively solve an optimization problem

$$\underset{x \in X}{\text{minimize}} \quad f(x) = f_1(x) + f_2(x), \quad (19)$$

where  $x \in \mathbb{R}^n$  is known as the public variable,  $f_i: \mathbb{R}^n \rightarrow \mathbb{R}, i = 1, 2$  are strongly convex functions, and the constraint set  $X \subseteq \mathbb{R}^n$  is convex. Then to solve (19) in a distributed manner using dual decomposition, we reformulate the Problem (19) as

$$\underset{x_1, x_2 \in X}{\text{minimize}} \quad f(x_1, x_2) = f_1(x_1) + f_2(x_2)$$

$$\text{Subject to} \quad x_1 = x_2, \quad (20)$$

where  $x_1 \in X$  and  $x_2 \in X$  belong to user 1 and user 2, respectively. Then the dual function associated with problem (20) is given by

$$\begin{aligned} d(\lambda) &= \inf_{x_1, x_2 \in X} [f_1(x_1) + f_2(x_2) + \lambda^T (x_1 - x_2)] \\ &= \inf_{x_1 \in X} [f_1(x_1) + \lambda^T x_1] + \inf_{x_2 \in X} [f_2(x_2) - \lambda^T x_2]. \end{aligned} \quad (21)$$

The dual problem is then given by  $\text{maximize}_{\lambda \in \mathbb{R}^n} d(\lambda)$ . The dual function is always concave (Boyd & Vandenberghe, 2004). Thus,  $-d(\lambda)$  is always convex. We let  $l(\lambda) = -d(\lambda)$ . Then the equivalent minimization problem is given by

$$\underset{\lambda \in \mathbb{R}^n}{\text{minimize}} \quad l(\lambda) \quad (22)$$

Then, the standard gradient method to solve (22) is given by

$$\lambda^{k+1} = \lambda^k - \alpha_k \nabla l(\lambda^k), \quad (23)$$

where  $\nabla l(\lambda^k) = x_2^k - x_1^k$  [see Equation (21)]. Here we note that some communication is required between user 1 and user 2 to construct  $\nabla l(\lambda^k)$ . Then, the dual variable  $\lambda$  can be updated by both users in parallel. However, the communication among users may not be perfect in practice due to unavoidable reasons such as quantization errors (Magnússon, Shokri-Ghadikolaei, & Li, 2020), computational errors, etc. Thus, instead of the exact gradient  $\nabla l(\lambda^k)$ , we consider an inexact gradient  $\widehat{\nabla} l(\lambda^k) = \hat{x}_2^k - \hat{x}_1^k$ , where  $\hat{x}_1^k = x_1^k + r_1^k$ , and  $\hat{x}_2^k = x_2^k + r_2^k$ , are the quantized versions of  $x_1^k$  and  $x_2^k$ , respectively. Here,  $r_1^k$  and  $r_2^k$  represent errors due to quantization. Then, we can solve (22) using the inexact gradient method (4). Clearly,  $\|r_1^k\|$  and  $\|r_2^k\|$  are bounded because they entirely depend on the size of the quantization grid. Thus, the total error  $\|r^k\| = \|\widehat{\nabla} l(\lambda^k) - \nabla l(\lambda^k)\|$  is also bounded. Hence, Assumption 3 holds. Moreover,  $\|\nabla l(\lambda^k)\|$  is also bounded because  $x_1^k, x_2^k \in X$  for all  $k$ . It follows that Assumption 2 holds. Further, the dual function  $l(\lambda)$  is with Lipschitz continuous gradients since the objective function  $f(x_1, x_2)$  is strongly convex (Magnússon, Shokri-Ghadikolaei, & Li, 2020), which is then leading to Assumption 1. Thus, we can observe that the convergence properties of the method (4) with the negative dual function  $l(\lambda)$  are guaranteed using Proposition 1.

We illustrate the convergence results in Proposition 1 numerically. We let  $f_1$  and  $f_2$  in (19) are quadratic functions such that,  $f_i = x_i^T A_i x_i + a_i^T x_i, i = 1, 2$ , where each  $A_i \in \mathbb{R}^{n \times n}$  is positive definite and  $x_i, a_i \in \mathbb{R}^n$ . Moreover, we let  $X = [-2, 2]^n$ , the  $n$ -fold cartesian product of  $[-2, 2]$ , (i.e.,  $X$  is a hypercube in  $\mathbb{R}^n$  with each side 4 units in length). We consider that the users transmit their quantized data at a rate of  $b$  bits per dimension in each iteration. To implement the quantization, we divide each side of  $X$  into  $2^b$  parts. Then,  $X$  consists of  $2^{nb}$  similar small hypercubes, each with a width of  $4/2^b$ . Then at each iteration -  $k$ , we choose the quantized data  $\hat{x}_i^k$  of  $x_i^k, i = 1, 2$  as the mid-point of the associated small hypercube that  $x_i^k$  lies. Figure 1 depicts the convergence results using  $n = 2$  for different bits (in this case,  $X$  is a square in  $\mathbb{R}^2$ ). Results show that  $\min_{i \in \{0, \dots, k\}} \|\nabla l(\lambda^i)\|$  converges around zero within some tolerance, and the tolerance decreases when the number of communicated bits increases. Figure 2 depicts the convergence results using  $b = 10$  for different dimensions of  $x_i$ s. Results show that the related tolerance get increases when the dimension  $n$  of the decision variable  $x$  increases.

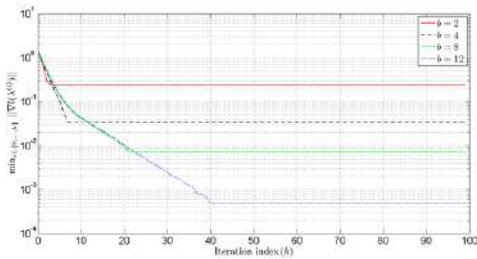


Figure 1: Convergence of dual gradients with different bits.

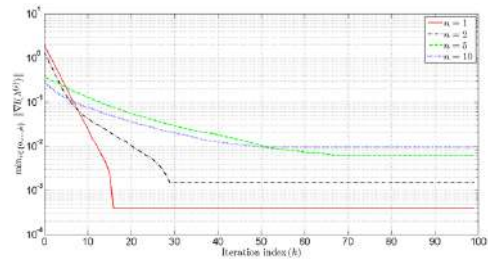


Figure 2: Convergence of dual gradients with different dimensions of the decision variable  $x$ .

## CONCLUSION

In this paper, we have considered a problem of minimizing a convex function with Lipschitz continuous gradients. The gradient method with inexact gradients is considered to solve the underlying optimization problem. The error involved due to the inexactness of the gradient is considered deterministic and bounded. The convergence properties of the gradient method with inexact gradients are analysed with the constant step size rule. Our theoretical results show that the inexact gradient method can converge to the optimality within some tolerance, where the tolerance depends on the underlying inexactness, step size, and the gradient Lipschitz continuity constant of the underlying objective function. Minimizing a sum of two strongly convex functions with a common decision variable is considered with dual decomposition as an application of distributed optimization. Finally, the theoretical results were verified using numerical experiments.

## REFERENCES

- Abeynanda, H., & Lanel, G. (2021). A study on distributed optimization over largescale networked systems. *Journal of Mathematics*, 2021.
- Bertsekas, D., & Tsitsiklis, J. (1999). Gradient Convergence in Gradient methods with Errors. *SIAM Journal on Optimization*, 10(3), 627–642.
- Boyd, S. (2014). Subgradient Methods. Retrieved from [http://stanford.edu/class/ee364b/lectures/subgrad\\_method\\_notes.pdf](http://stanford.edu/class/ee364b/lectures/subgrad_method_notes.pdf)
- Boyd, S., & Vandenberghe, L. (2004). *Convex Optimization*. USA: Cambridge University Press.
- Chen, J., & Luss, R. (2018). Stochastic Gradient Descent with Biased but Consistent Gradient Estimators. Retrieved from <http://arxiv.org/abs/1807.11880>
- Khairat, S., Wang, X., Magnússon, S., & Johansson, M. (2021). Improved Step-Size Schedules for Noisy Gradient Methods. *ICASSP 2021 - 2021 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)* (pp. 3655-3659). IEEE.
- Magnússon, S., Shokri-Ghadikolaei, H., & Li, N. (2020). On Maintaining Linear Convergence of Distributed Learning and Optimization Under Limited Communication. *IEEE Transactions on Signal Processing*, 68, 6101–6116.
- Michelusi, N., Scutari, G., & Lee, C.-S. (2018).inite rate quantized distributed optimization with geometric convergence. 2018 52nd Asilomar Conference on Signals, Systems, and Computers, (pp. 1876–1880).
- Nedić, A., & Bertsekas, D. (2010). The effect of deterministic noise in subgradient methods. *Mathematical Programming*, 125(1), 75–99.
- Nedić, A., & Ozdaglar, A. (2009). Distributed Subgradient Methods for Multi-Agent Optimization. *IEEE Transactions on Automatic Control*, 54(1), 48-61.
- Nedić, A., Olshevsky, A., Ozdaglar, A., & Tsitsiklis, J. N. (2008). Distributed subgradient methods and quantization effects. 2008 47th IEEE Conference on Decision and Control, (pp. 4177-4184).
- Polyak, B. T. (1987). *Introduction to Optimization*. NY: Inc., Publications Division.
- Pu, Y., Zeilinger, M., & Jones, C. (2017). Quantization design for distributed optimization. *IEEE Transactions on Automatic Control*, 62(5), 2107–2120.
- Solodov, M., & Zavriev, S. (1998). Error stability properties of generalized gradient-type algorithms. *Journal of Optimization Theory*, 98(3), 663–680.



## Exact Solution for the Upper Minimal Total Cost Bound of Multi-Supplier Single-Buyer Interval Transportation Problem

Jayani Gamage<sup>1\*</sup>

<sup>1</sup>Department of Mathematics and Statistics, Faculty of Humanities and Sciences, SLIIT, Malabe

### ARTICLE INFO

#### Article History:

Received Date: 01 July 2022

Accepted Date: 15 September 2022

#### Keywords:

Demand and Supply; Transportation problem; Transportation cost; Total cost bound

#### Citation:

Jayani Gamage. (2022). *Exact Solution for the Upper Minimal Total Cost Bound of Multi-Supplier Single-Buyer Interval Transportation Problem*. Proceedings of SLIIT International Conference on Advancements in Sciences and Humanities, (11) October, Colombo, 196 - 200.

### ABSTRACT

Transporting a commodity from sources to destinations with minimal transportation cost is the main goal in all industries. In the literature, researchers have given considerable attention to find the total minimum transportation cost in fixed supply and fixed demand quantities. However, in the real-world supply, demand values will vary in a certain range due to the variation of the global economy. The number of combinations of supplies and demands rapidly increase in their respective ranges as the number of suppliers and buyers increases. To make better decisions on investments, it is useful to know the lower and the upper bounds of the minimal total costs in the interval transportation problem (ITP). However, no exact solution has been identified to obtain the upper bound of minimal transportation cost. In this research, a new algorithm has been developed to determine all the choices of supplies and demands in multi-supplier single-buyer transportation problems. Based on the new method, the minimum transportation cost can be found for each combination that satisfies the fundamental theory of transportation problem (total supplies value  $\geq$  demand value). Furthermore, the maximum cost as the upper minimal total cost bound can also be obtained. The new methodology is illustrated using real data. It is also shown that the proposed method is able to obtain the exact solution for the upper minimal total cost bound of multi-supplier single-buyer ITP.

\* Jayani Gamage, Jayani.g@sliit.lk

## INTRODUCTION

Transportation Problem (TP) is a special type of linear programming problem where the main purpose is to minimize the transportation cost. TP was introduced (Hitchcock, 1941) and based on this TP model several other methods have been developed. To solve TP, the simplex method was developed (Dantzig, G.B., 1963). A new algorithm was developed by (Adlakha & Kowalski, 2003) to solve fixed charge TP. When transporting commodities from sources (factory, manufacturing facility) to the destinations (shops, store, warehouse) it is important for sources to know how many quantities that they are going to supply to satisfy the demand with minimal transportation cost. However, supply and demand quantities of a product can vary within a certain range in a period due to the variation in the global economy. According to this fluctuation, the minimal transportation cost (MTC) varies within a range. It is difficult to obtain an exact upper bound of the MTC using the existence methods. A few studies have been done to obtain the upper MTC. Liu (Liu, 2003) and Juman and Hoque (Juman & Hoque, 2014) found two methods which were unable to obtain the upper bound of the MTC.

The objective of this research is to develop a concrete method to find a solution for the upper minimal total cost bound of multi-supplier single buyer TP with varying demands and supplies.

## MATERIALS AND METHODS

The following assumption and notations are used in this new method.

### Assumptions

A homogeneous product is transported from multi supplier to a single buyer.

Demand of the product is deterministic integer and variable over time.

The total supply is an integer and must be greater than or equal to the total demand.

The buyer has enough storage capacity to accommodate the required inventory.

A transport vehicle is available to transport required shipment quantities.

## Notations

$m$  - total number of suppliers (supply nodes),  
 $s_i$  - supply quantity from  $i^{\text{th}}$  supplier,

$d$  - the demand per unit time to buyer,  $C_{i1}$  - unit transportation cost from  $i^{\text{th}}$  supplier to buyer,

$\underline{s}_i$  - lower bound of supplies from the  $i^{\text{th}}$  supplier,  $\bar{s}_i$  - upper bound of supplies from the  $i^{\text{th}}$  supplier,  $\underline{D}$  - lower bound of the buyer,  $\bar{D}$  - upper bound of the buyer,

$x_{i1}$  - number of units transported from  $i^{\text{th}}$  supplier to buyer.

## METHODOLOGY

The method of finding all the combinations.

First set  $k=0$ ,  $i=m$  and  $(s_i) = \underline{s}_i \quad \forall i=1,2,\dots,m$  &  $d = \underline{D}$ . That is  $(\underline{s}_1, \underline{s}_2, \dots, \underline{s}_m, \underline{D})$ . Then  $(m+1)!$  combinations can be found from the  $(\underline{s}_1, \underline{s}_2, \dots, \underline{s}_m, \underline{D})$ . Now  $d$  has to increase by 1 if  $d \neq \bar{D}$ . Suppose  $d \neq \bar{D}$ , then by increasing  $d$  by 1, again  $(m+1)!$  combinations can be found. The above step must repeat until  $d = \bar{D}$  then altogether there are  $(m+1)! (\Delta d + 1)$  number of combinations. If  $s_{(m-k)} \neq \bar{s}_{(m-k)}$  for some  $k$  &  $d = \bar{D}$ , (now  $k=0$ ) suppose  $s_m \neq \bar{s}_m$  then  $(m+1)!$  combinations can be obtained by increasing  $s_m$  by 1 while keeping all the other suppliers at their current values as fixed and demand as its lower bound. Then  $d$  has to increase by 1 until it reaches its upper bound. Then  $(m+1)! (\Delta d + 1)$  number of combinations can occur when  $d$  reaches its upper bound. Repeat the above step until  $s_m = \bar{s}_m$ .

Then there are  $(m+1)! (\Delta d + 1) (\Delta s_{m+1})$  number of combinations. Now  $s_m = \bar{s}_m$  and  $d = \bar{D}$ , therefore  $m$  has to be replaced by  $(m-1)$  and  $k=\{0,1\}$ . If  $s_m \neq \bar{s}_m$  (i.e.  $k=0$ ) &  $s_{(m-1)} \neq \bar{s}_{(m-1)}$  (i.e.  $k=1$ ) now increase  $s_{(m-1)}$  only by 1 then  $s_m$  has to increase by 1 until its upper bound is reached while keeping  $s_{(m-1)}$  as it is. Then  $(m+1)! (\Delta d + 1) (\Delta s_{m+1})$  number of combinations can be obtained. Now  $s_{(m-1)}$  has to increase by 1 until its upper bound is reached,  $(m+1)! (\Delta d + 1) (\Delta s_{m+1}) (\Delta s_{(m-1)+1})$  A number of combinations can be obtained. By repeating this process until  $i=1$ ,  $(m+1)! (\Delta d + 1) (\Delta s_{m+1}) (\Delta s_{(m-1)+1}) \dots (\Delta s_{1+1})$  number of combinations can be found. That is the total number of combinations are equal to  $(m+1)! \prod_{i=1}^m (\Delta s_i + 1)$ .



$\lceil (\Delta s_{i+1}).(\Delta d+1) \rceil$ . Note that when we consider  $m^{\text{th}}$ ,  $(m-1)^{\text{th}}$ ,  $(m-2)^{\text{th}}$  suppliers,  $k$  values are  $k=0$ ,  $k=0,1$  and  $k=0,1,2$  respectively..

After finding all the possibilities, the combinations which the total supplies value is greater or equal to demand value are filtered. Then in filtered combinations minimal total cost  $Z(\text{say})$  and corresponding solutions  $x_{i1}$ ,  $(s_i)$ ,  $d$  to each combination can be found. Among those values the upper minimal total cost bound and corresponding  $x_{i1}$ ,  $(s_i)$ ,  $d$  can be obtained.

## RESULTS AND DISCUSSION

In this section, the proposed algorithm is used to solve problems of interval transportation problem (ITP) and compared against Liu's (2003) approach and Juman and Hoque (2014)'s approach to evaluate the performance of the proposed algorithm. The proposed algorithm is coded with JAVA and run-on PC Intel Core i3 with memory 4096MB.

The following three cases (two suppliers & one buyer), (three suppliers & one buyer), and (four suppliers & one buyer) are solved and compared with upper bound total cost. When compared to the other two methods, even though the CPU time is higher, the proposed method provides better upper minimal total cost.

Numerical problem 1: (2 – suppliers & 1 – buyer)

$$\underline{S}_1 = 500, \bar{S}_1 = 70; \underline{S}_2 = 100, \bar{S}_2 = 200; \underline{D} = 200, \bar{D} = 300; C_{21} = [25 \quad 85]^T$$

Numerical problem 2: (2 – suppliers & 1 – buyer)

$$\underline{S}_1 = 90, \bar{S}_1 = 290; \underline{S}_2 = 100, \bar{S}_2 = 300; \underline{D} = 200, \bar{D} = 300; C_{21} = [25 \quad 10]^T$$

Numerical problem 3: (2 – suppliers & 1 – buyer)

$$\underline{S}_1 = 1, \bar{S}_1 = 100; \underline{S}_2 = 1, \bar{S}_2 = 75; \underline{D} = 5, \bar{D} = 25; C_{21} = [34 \quad 25]^T$$

Numerical problem 4: (2 – suppliers & 1 – buyer)

$$\underline{S}_1 = 100, \bar{S}_1 = 200; \underline{S}_2 = 150, \bar{S}_2 = 300; \underline{D} = 100, \bar{D} = 150; C_{21} = [75 \quad 100]^T$$

Table 1. Comparative upper bound solutions for two suppliers and one buyer

Numerical problem	Method of Liu (2003)		Method Of J & H (2014)		New exact method		% Increase in the UB by exact method over	
	Cost	CPU time (s)	Cost	CPU time (s)	Cost	CPU time (s)	Method of Liu (2003)	Method of J & H (2014)
1	7500	1	7500	2.1627	17000	9.719	126.7	126.7
2	7530	1	7530	1	8990	1.45	19.4	19.4
3	5250	1	5370	1.2	10230	2.13	94.9	90.5
4	8515	1	8515	1	10115	1.65	18.8	18.8

Numerical problem 5: 3-suppliers

$\underline{S}_1 = 50, \bar{S}_1 = 100; \underline{S}_2 = 60, \bar{S}_2 = 80; \underline{S}_3 = 75, \bar{S}_3 = 95; \underline{D} = 45, \bar{D} = 65; C_{31} = [90 \ 15 \ 80]^T$

Numerical problem 6: 3-suppliers

$\underline{S}_1 = 50, \bar{S}_1 = 110; \underline{S}_2 = 70, \bar{S}_2 = 110; \underline{S}_3 = 70, \bar{S}_3 = 110; \underline{D} = 210, \bar{D} = 260; C_{31} = [90 \ 15 \ 80]^T$

**Table 2.** Comparative upper bound solutions for three suppliers and one buyer

Numerical problem	Method of Liu (2003)		Method of J & H (2014)		New exact method		% Increase in the UB by exact method over	
	Cost	CP U time (s)	Cost	CP U time (s)	Cost	CPU time (s)	Method Liu (2003)	Method of J & H(2014)
5	1300	1	975	0.5836	5850	5.117	350	500
6	17350	1	14050	1.5801	18700	1107.133	7.78	33.09

Numerical problem 7: (4 – suppliers & 1 – buyer)

$\underline{S}_1 = 45, \bar{S}_1 = 60; \underline{S}_2 = 30, \bar{S}_2 = 50; \underline{S}_3 = 60, \bar{S}_3 = 80; \underline{S}_4 = 75, \bar{S}_4 = 95; \underline{D} = 30, \bar{D} = 45; C_{41} = [15 \ 90 \ 88 \ 75]^T$

Numerical problem 8: (4 – suppliers & 1 – buyer)

$\underline{S}_1 = 100, \bar{S}_1 = 115; \underline{S}_2 = 105, \bar{S}_2 = 120; \underline{S}_3 = 95, \bar{S}_3 = 110; \underline{S}_4 = 120, \bar{S}_4 = 140; \underline{D} = 420, \bar{D} = 470; C_{41} = [15 \ 90 \ 88 \ 75]^T$

**Table 3.** Comparative upper bound solutions for four suppliers and one buyer

Numerical problem	Method of Liu (2003)		Method of J & H (2014)		New exact method		% Increase in the UB by exact method over	
	Cost	CP U time (s)	Cost	CP U time (s)	Cost	CP U time (s)	Method of Liu (2003)	Method of J & H (2014)
7	675	1	675	0.5032	4050	49.202	500	500
8	32480	1	31355	0.6635	32480	1238.283	0	3.59

## CONCLUSION

Transportation of products from multi sources to multi destination with minimal transportation cost plays an important role in logistics and supply chain management. Real word supply and demand quantities may vary within a certain range due to the variation of the global economy such as weather, social or economic conditions. Following this variation, minimal total cost also varies within a certain rage. To make better decisions, especially for proper investments and returns, finding the lower and the upper bounds of the minimal total cost with varying supplies and demands within their considered ranges is very important. Two Previous studies have failed to obtain the upper minimal total cost because those two methods failed to obtain all the combinations. The proposed algorithm is performing better than the existing approaches because,  $(m+1)! \prod_{i=1}^m ((\Delta s_i + 1) \cdot (\Delta d_i + 1))$ , all the choices of supplies and demands can be found for  $m$  suppliers and single buyers. Therefore, the exact solution for the upper minimal total cost of multi-supplier, single-buyer ITP can be found. Future research needs to be carried out to develop this technique for multi-supplier multi-buyer transportation problem with varying demands and supplies. In this research, the lead time of delivering an order is considered as zero. But in real world it might not be zero. Lead time can vary because of the presence of some realistic factors like variations in loading, transportation and unloading. Therefore, it is recommended to incorporate lead time into the current model.

## REFERENCES

- Adlakha, V., & Kowalski, K. (2003). A simple heuristic for solving small fixed-charge transportation problems. *Omega*, 31(3), 205–211.
- Dantzig, G.B. (1963) *Linear Programming and Extensions*. Princeton University Press, Princeton. - References - Scientific Research Publishing. (n.d.).
- Hitchcock, F. L. (1941). The Distribution of a Product from Several Sources to Numerous Localities. *Journal of Mathematics and Physics*, 20(1–4), 224–230.
- Juman, Z. A. M. S., & Hoque, M. A. (2014). A heuristic solution technique to attain the minimal total cost bounds of transporting a homogeneous product with varying demands and supplies. *European Journal of Operational Research*, 239(1), 146–156.
- Juman, Z. A. M. S., & Hoque, M. A. (2015). An efficient heuristic to obtain a better initial feasible solution to the transportation problem. *Applied Soft Computing*, 34, 813–826.
- Liu, S. T. (2003). The total cost bounds of the transportation problem with varying demand and supply. *Omega*, 31(4), 247–251.



## Modeling Weekly Covid Data in Europe and Sri Lanka: Time Series Approach

Jayakody, J. A. P. A<sup>1\*</sup>

<sup>\*1</sup>Department of Mathematics and Statistics, Faculty of Humanities and Sciences, SLIIT, Malabe

---

### ARTICLE INFO

#### Article History:

Received Date: 01 July 2022

Accepted Date: 15 September 2022

---

#### Keywords:

ARIMA Models, Covid-19, Forecasting

---

#### Citation:

Jayakody, J. A. P. A1. (2022). *Modeling Weekly Covid Data in Europe and Sri Lanka: Time Series Approach*. Proceedings of SLIIT International Conference on Advancements in Sciences and Humanities, (11) October, Colombo, 201 - 206.

---

### ABSTRACT

Novel Corona Virus, commonly known as COVID-19 has become a global threat affecting more than 200 countries up to date. Still a vaccine that can assure of hundred percent prevention has not been discovered. All the countries are currently following WHO guidelines such as lockdowns and social distancing. This study was conducted to develop ARIMA models for COVID-19 data in Europe and Sri Lanka and validate the models. For both these regions, number of COVID-19 cases were collected considering for a period of one year in which the first real wave happened. ACF and PACF plots were used to identify the stationarity, and out of the results possible ARIMA models were developed for the two regions separately. For Europe, the best fitted model was ARIMA (0, 2, 1) and for Sri Lanka, the best fitted model was ARIMA (1,1,0). The models were evaluated using AIC criteria. The errors of the models were found to be white noise. The forecasted values that were obtained from the model showed an increase of cases in Europe and a constant flow in Sri Lanka.

---

\*Jayakody, Jayani.g@sliit.lk

## INTRODUCTION

An epidemic is a disease that affects a significant number of people within a region or a country. When an epidemic is spread over multiple countries, it becomes a pandemic (Morens et al., 2009). An epidemic or a pandemic affects the world and its people causing tragic deaths, economical and health issues. When such a disease is spread, scientists try to understand its spread and transmission to prepare for a future threat, which is known as Epidemiology.

The latest epidemic disease, Covid-19 which is caused by 'severe acute respiratory syndrome coronavirus 2 or (SARS-CoV-2)' was also started in Wuhan, China and has been spreading over more than 200 countries to date. This is transferred by the droplets that are produced when an infected person breathes or coughs. Since these droplets are invisible to the human eye and since it takes a range from 2 to 14 days to develop symptoms, it has been easier for the virus to spread. SARS-COV-2 virus directly affects the respiratory system causing sore throat or sneezing at the primary stages. Most of the positive individuals experience loss of taste and smell (Menni et al., 2020). Sometimes these can be developed to pneumonia, multi-organ failure and death. However, the deaths are not direct results of the virus itself, because some studies have been carried out significantly showing that the significant proportion of deaths is due to pneumonia or cardiovascular-related diseases (Zheng et al., 2020). COVID-19, as an emerging disease lack statistical research. At an early stage of the outbreak, the median age was found out to be 59 years and 56% of the cases were male. The mean incubation period was 5.2 and at those preliminary stages, the epidemic doubled in size every 7.4 days.

The basic reproductive number was estimated as 2.2 (Li et al., 2020). From the past experiences on epidemics, it was evident that second and third waves would occur. Therefore, at earlier stages of the outbreak, studies interpreted a second peak in Wuhan as a warning for the public health authorities (Roda et al., 2020). Since it has affected internationalized countries such as the USA, China and Russia, those countries have intentionally participated in finding a cure. Unfortunately, up to date, all the drugs and vaccines that have been produced are still in

testing and developing stages. However, the entire world is in an urge to find an anti-vaccine so that the people can be free of COVID-19 and build a durable base for future epidemics (Le et al., 2020). Without an exact vaccine or antiviral drugs, control measures are necessary to understand the evolution of cases.

Since the spread of COVID-19 was in an out-of-control stage, scientists tried to model and predict its distribution using time series models. A time series analysis that was performed comparing and differencing the spread of the two regions Hubei province (China) and the US (Zhao et al., 2020) resulted that time series parameters are different with each wave. In India, ARIMA models were used to model the spread of COVID-19 in the initial stages of the outbreak (Tandon et al., 2020).

On view of the above, this study is conducted to develop in ARIMA models for COVID-19 data in Europe and Sri Lanka and validate the models.

## MATERIALS & METHODS

### Data

For the analysis, the number of weekly cases and deaths in Europe was extracted from the official website of the WHO regional office for Europe from 30th March 2020 to 26th October 2020. Weekly data of COVID-19 in Sri Lanka was considered from October 2020 to first week of March 2021 and was extracted from weekly reports that were published by the Ministry of Health, Sri Lanka. Note that these two time periods are considered as first waves relative to the two regions.

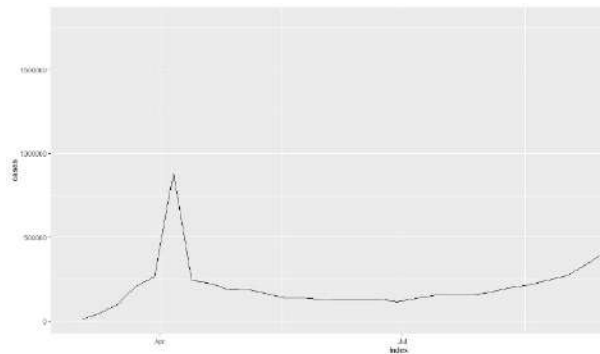
## METHODOLOGY

The collected weekly data is used to obtain ACF plots PACF plots. KPSS test is used to check whether the data is trend stationary. A trend-stationary process is a stochastic process, which can be turned into a stationary process by removing the underlying trend. After differencing data to reach stationarity, possible ARIMA models are constructed and out of those models AIC and BIC values are used to select the best fitted model. Then, a residual analysis is carried out to check the properties of a good-fitted model, that is having no correlations among data and residuals following a normal distribution with zero mean. Moreover, a Ljung-

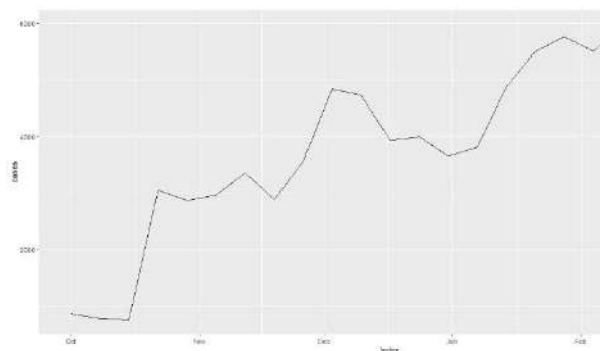
Box test is carried out to check the null hypothesis the autocorrelations of a certain time series equal to zero. Finally, a forecast plot is obtained so that COVID-19 spread can be predicted under a considerate significance.

## RESULTS AND DISCUSSION

### Comparing the Time Series Data



**Fig 1: Total Cases-Europe**



**Fig 2: Total Cases-Sri Lanka**

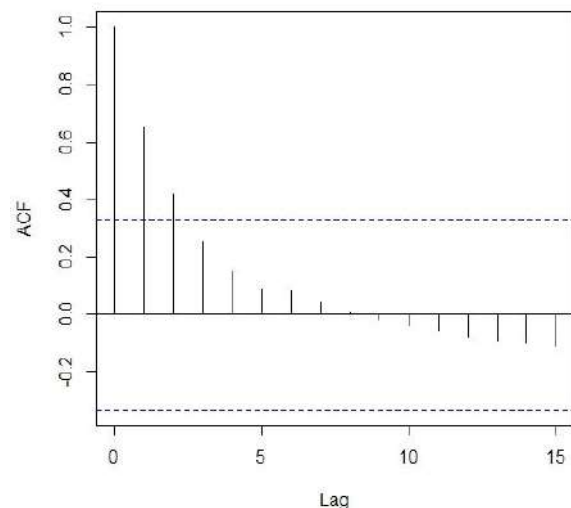
Check for the Stationarity of the Europe Data  
Using the information taken from the Europe regional office for WHO, time series for the number of cases is observed. At 10% significance, the obtained time series is found out to be trend-stationary by using a KPSS test. After two differencing time series becomes stationary and the corresponding results and p values are given in the Tables 1 at 10% significance.

Table 1: KPSS Test Statistics for each Differencing

Differencing	KPSS Value	P value (10%)
0	0.492	0.347
1	0.3956	
2	0.1262	

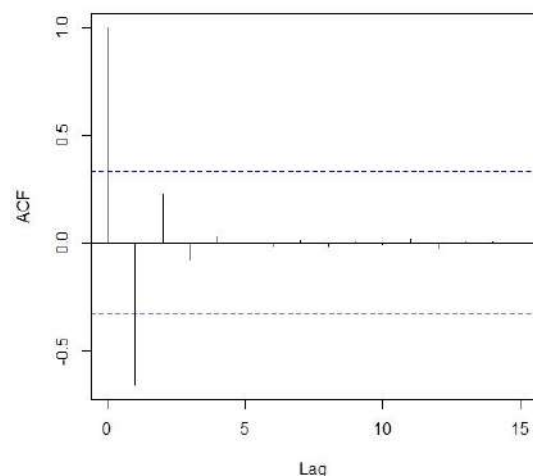
### ACF of the Original Series- Europe

In the ACF that was obtained as in Figure 1, three significant spikes can be seen, and it is decaying slowly. This implies that the time series we obtained is non-stationary, which was also proved by the KPSS tests above. Since KPSS test suggested two differencing, ACF plot (Figure 2) and PACF plot (Figure 3) that were observed, after suggesting the series is stationary then.

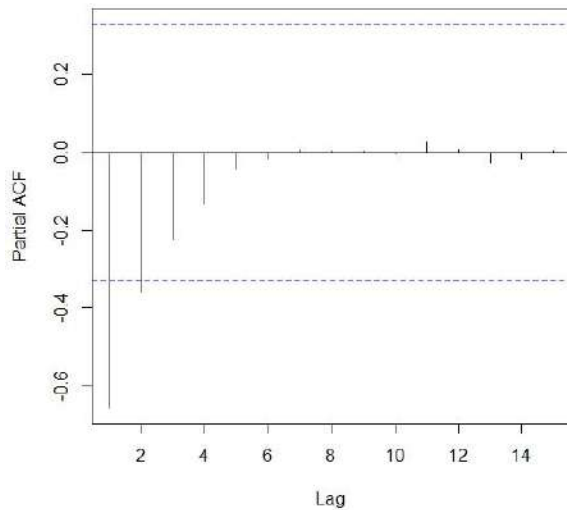


**Fig 3: ACF Plot of Total Cases-Europe**

### ACF and PACF of the Differenced Series - Europe



**Fig 4: ACF Plot of Total Cases after Two Differencing-Europe**



**Fig 5: PACF Plot of Total Cases after Two Differencing-Europe**

#### Possible Models- Europe

Since the ACF and PACF plots are suggesting ARIMA models, possible 6 ARIMA models are compared to find the best fit. According to the Table 2, (1, 2, 1) and (0, 2, 1) ARIMA models have the lowest AICs which are similar with each other. But, the lowest BIC is regarded to the second model, also it consists with less parameters, therefore, ARIMA (0, 2, 1) is chosen as the final model.

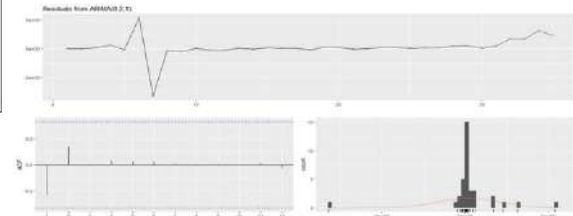
**Table 2: Goodness of Fit Statistics-Europe**

Model	AIC	BIC
(1,2,2)	902.25	908.24
(1,2,1)	900.30	904.79
<b>(0,2,1)</b>	<b>900.73</b>	<b>903.72</b>
(1,2,0)	904.62	907.62

#### Check the Residuals of the Selected Model-Europe

After choosing ARIMA (0, 2, 1) as the final model based on the AIC values, residual analysis is performed to confirm that the model is a good fit to interpret the time series data. In obtained residual ACF plot given in Figure 4, all the residuals are within the threshold limits implying that no correlation exists among data which can be considered as a property of a good forecasting model. Moreover, residual histogram plot implies the mean residual is zero and a normal distribution exists. However, the

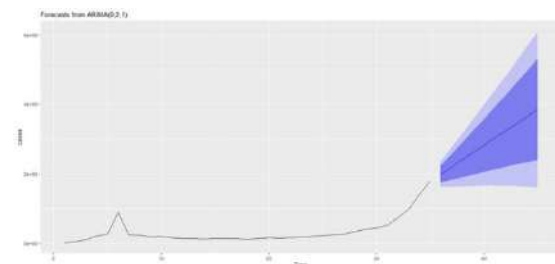
main two properties which are zero autocorrelation, and zero mean residual is satisfied. The relative Ljung-Box test gives a p value of 0.8066, which is remarkably high for 0.05 significance. Therefore, all these observations confirm that the obtained ARIMA (0, 2, 1) model is a good fit to interpret the total COVID-19 cases in Europe.



**Fig 6: Residual Plot of ARIMA (0,2,1)-EuroARIMA (0, 2, 1) Forecasted Plot-**

#### Europe

After confirming the ARIMA (0, 2, 1) model to be a good fit to represent COVID-19 cases in Europe, the forecasted plot is obtained and given in Figure 5. In the figure, the dark blue shades are representing 80% interval of the prediction and the light blue shades represent 95% interval of prediction. According to the prediction, the number of cases arise continuously, therefore Europe region should continue health policies to overcome COVID-19 pandemic.

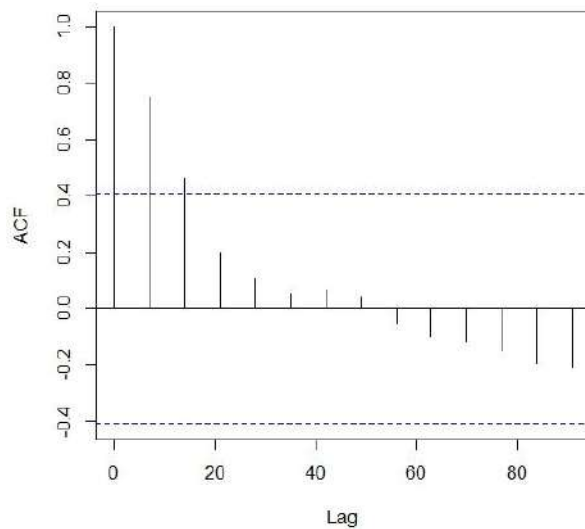


**Fig 7: Forecasted Plot of ARIMA (0,2,1)-Europe**  
**Check for the Stationarity of the Sri Lankan Data**

However, for Sri Lanka, the models were different from those from Europe. In the ACF plot in Figure 6, slowly decaying pattern indicates that the time series is non-stationary. After using a KPSS test time series for COVID-19 in Sri Lanka is found out to be trend-stationary, therefore differencing can be used to make it stationary, but here unlike for Europe, time series becomes stationary at order 1, instead of going for second order differencing. The ACF and PACF that is given in Figure 7 and 8

respectively shows that after differencing once, the series becomes stationary.

**ACF of the Original Series- Sri Lanka**

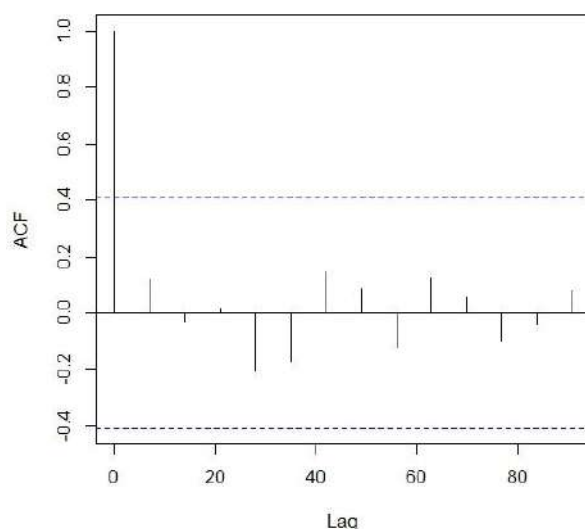


**Fig 8:** ACF Plot of Total Cases-Sri Lanka

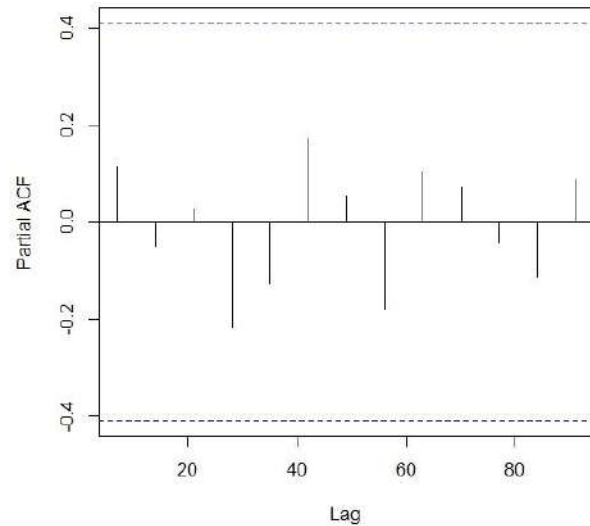
**Table 3:** KPSS Test Statistics for each Differencing

Differencing	KPSS Value	P value (10%)
0	0.4917	0.347
1	0.3016	

**ACF and PACF of the Differenced Series- Sri Lanka**



**Fig 9:** ACF Plot of Total Cases after One Differencing –Sri Lanka



**Fig 10:** PACF Plot of Total Cases after One Differencing -Sri Lanka

### Possible Models- Sri Lanka

Now, since the ACF and PACF plots suggest ARIMA model with one differencing, seven possible models are created. Comparing AIC values as given in Table 4 ARIMA (0,1,1) and ARIMA (1,1,0) can be selected. Both models have two parameters, for considering the lowest BIC value, ARIMA (1,1,0) is selected to continue.

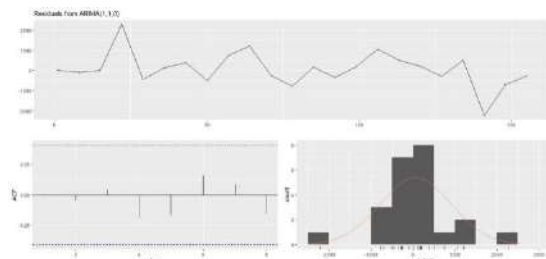
**Table 4:** Goodness of Fit Statistics-Sri Lanka

Model	AIC	BIC
(0,1,1)	363.18	370.15
(1,1,1)	365.00	371.34
(1,1,0)	363.21	369.12
(0,1,2)	365.15	371.86

### Check the Residuals of the Selected Model- Sri Lanka

Considering the residual plot for ARIMA (1,1,0) given in Figure 9, two assumptions for a good fit is satisfied; that is in the ACF plot for residuals, all the autocorrelations are equal to zero and in the histogram, mean residual is equal to zero and normal distribution for residuals can be seen. Therefore, we can consider the obtained model as good fit to represent COVID-19 cases in Sri Lanka. Moreover, Ljung-Box test gives a p value of 0.705 which is remarkably high compared to the 0.05 significance, implying the autocorrelations are equal to zero.

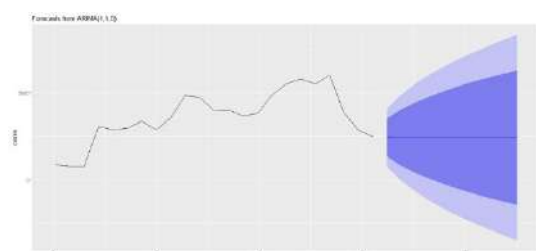




**Fig 11:** Residual Plot of ARIMA (1,1,0)-Sri Lanka

### ARIMA (1, 1, 0) Forecasted Plot- Sri Lanka

In the forecast plot that is obtained using ARIMA (1,1,0) in Figure 10, we can see the number of cases tend to stay in a constant value rather than increasing or decreasing.



**Fig 12:** Forecasted Plot of ARIMA (1,1,0)-Sri Lanka

### CONCLUSION

According to the time series analysis in Sri Lanka, the selected model was ARIMA (1,1,0). From the model, predictions show that the number of cases approach a constant lower value, which is a good sign, however, continuing the health policies is highly recommended. In Europe, number of total cases follows an ARIMA (0, 2, 1) model. Note that the same model was observed for daily data in US from 29th February to 28th April 2020 (Zhao et al., 2020). However, in India the observed time series model was ARIMA (2, 2, 2) (Tandon et al., 2020). For Sri Lanka, the observed model was ARIMA (1, 1, 0). With these different models it is evident that the time series dynamics of COVID-19 differs from region to region and country to country. In Europe region, huge increase of the cases has been predicted. For Sri

Lanka, the number of predicted cases has been reached for a constant number. But, at the end of the data collection period, the third wave was started, so most probably the predictions may differ from the observed.

### REFERENCES

- Le, T. T., Andreadakis, Z., Kumar, A., Román, R. G., Tollefsen, S., Saville, M., & Mayhew, S. (2020). The COVID-19 vaccine development landscape. *Nat Rev Drug Discov*, 19(5), 305-306.
- Li, Q., Guan, X., Wu, P., Wang, X., Zhou, L., Tong, Y., & Feng, Z. (2020). Early transmission dynamics in Wuhan, China, of novel coronavirus-infected pneumonia. *New England journal of medicine*.
- Menni, C., Valdes, A. M., Freidin, M. B., Sudre, C. H., Nguyen, L. H., Drew, D. A., ... & Spector, T. D. (2020). Real-time tracking of self-reported symptoms to predict potential COVID-19. *Nature medicine*, 26(7), 1037-1040.
- Ministry of Health. (2021, March 10) Coronavirus disease 2019 (COVID-19) - Situation Report, from <http://www.epid.gov.lk/web/>
- Morens, D. M., Folkers, G. K., & Fauci, A. S. (2009). What is a pandemic?
- Roda, W. C., Varughese, M. B., Han, D., & Li, M. Y. (2020). Why is it difficult to accurately predict the COVID-19 epidemic? *Infectious Disease Modelling*, 5, 271-281
- Tandon, H., Ranjan, P., Chakraborty, T., & Suhag, V. (2020). Coronavirus (COVID-19): ARIMA based time-series analysis to forecast near future.



## Identifying Proteins Associated with Disease Severity

O. Samarawickrama<sup>1\*</sup>, R. Jayatillake<sup>2</sup> and D. Amaratunga<sup>3</sup>

<sup>1\*</sup>Department of Statistics, Faculty of Science, University of Colombo

<sup>2</sup>Department of Statistics, Faculty of Science, University of Colombo

<sup>3</sup>Princeton Data Analytics

### ARTICLE INFO

#### Article History:

Received Date: 01 July 2022

Accepted Date: 15 September 2022

#### Keywords:

Proteomic studies; Ordinal nature; Trend tests; Lasso regularization; Bootstrapping

#### Citation:

O. Samarawickrama, R. Jayatillake and D. Amaratunga (2022). *Identifying Proteins Associated with Disease Severity*. Proceedings of SLIIT International Conference on Advancements in Sciences and Humanities, (11) October, Colombo, 207 - 211.

### ABSTRACT

Proteomic studies or studies of protein expression levels are growing swiftly with the steady improvement in technology and knowledge on understanding various anomalies affecting humans. Since differentially expressed proteins have an influence on overall cell functionality, this improves discrimination between healthy and diseased states. Identifying prime proteins offers prospective insights for developing optimized and targeted treatment methods. This research involves analyzing data from an early-stage study whose main purpose was to identify differentially expressed proteins. The presence of 3 progressively serious states of disease (healthy to mild to severe) escalates the importance of this study because there is not much research literature that considers ordinal outcomes in studies of this nature. The analysis can be segregated into 2 stages, univariate and multi-protein analysis. Approach of the univariate analysis was to implement continuation ratio model considering one protein at a time to pick those that exhibit potential ordinality. Penalized continuation ratio model using lasso regularization incorporated with bootstrapping proteins was performed as the next stage to identify protein combinations that perform well together. Compound results of the univariate and multi-protein analysis identified 20 most dominant proteins that have the capability to discriminate between the disease states in an ordinal manner satisfactorily.

\* Samarawickrama, ovinrams@gmail.com

## INTRODUCTION

Being an essential substrate of living matter, proteins have a distinctive significance in biology. Wherever growth and reproduction take place in living organisms, proteins play a vital role in building cellular structures, in mediating metabolic pathways, in protection mechanisms, in transporting materials and so forth, simply being the major building block and the major functional bio-polymer to maintain life on Earth. Differential expression of proteins leads to over-functioning, under-functioning, normal functioning, or unrelated/silencing effects on the overall functionality of the cells allowing to discriminate between the healthy and diseased conditions leading to a huge diversity among phenotypes of organisms (Alberts et al., 2002).

In the development of drugs for diseases, understanding the expression patterns and the differential expression of proteins is of vital importance (Yang et al., 2018). Hence, the study discussed in this paper will help to systematically profile the protein expression related to disease progression which would be important in the medical field to align the obtained data more authentically with the disease condition. This approach would be helpful to identify potential protein biomarkers that could be used to identify diseased individuals or subtype of disease, the stage and progression of the disease (early, mid or late), hence improving diagnosis for patient management and treatment, and also to identify potential drug targets which could be used for drug development (Rusling et al., 2010).

This study considers three groups that have an ordinal categorical setting. If proteins whose expression levels following an ordinal pattern are to be found, this could reveal interesting insights that would be beneficial for biological mechanisms and will leave room for further studies (Langley & Mayr, 2015).

The primary objective of this research is to study the differential expression of proteins upon a disease condition taking into account the ordinal nature of the disease severity.

## MATERIALS AND METHODS

Data are from an actual study where the research area is right now at a fairly early stage. The expression levels of 144 proteins were

measured for 45 subjects using a multiplex procedure in which all the proteins were studied simultaneously. The levels of the target group are ordered: healthy, mild and severe. Out of the 45 subjects, 15 are healthy, 15 are mildly diseased and the remaining 15 are severely diseased.

The analysis of this high-throughput protein data (Lubomirski et al., 2007) can be segregated into two sections, namely univariate and multi-protein analysis. Since proteins of most interest are those that follow the ordinal pattern, trend tests were utilized. Approach of the univariate analysis was to implement forward continuation ratio (CR) model which compares a particular level to higher levels considering each protein individually (Liu, 2010). CR model which is also known as the stage approach model focuses on transitions of successive levels and it assumes that the lower levels have been reached first. The odds of being in a particular level in comparison to being above that level are estimated using maximum likelihood methods (Liu, 2010). This implementation was befitting since the target group levels were successive. For a subject to become severely diseased, it is needed to surpass the stages healthy and mildly diseased. Considering the expression levels of one protein at a time as the explanatory variable, the model implementation was iterated across all the 144 proteins. In addition, if the p value of the logit coefficient was less than the general threshold of 0.05, such proteins were noted as ones whose expression levels have a potential effect on the disease severity.

In the multi-protein context, penalized continuation ratio modelling using lasso regularization (Tibshirani, 1996) incorporated with bootstrapping proteins was implemented. The reason for using lasso regularization was because of its feature selection capability. Thus, redundant variables that do not add any information can be removed. In bootstrapping, random sampling with replacement is used to generate novel samples of the same sample size (Efron, 1992; Hesterberg, 2011). The approach of this study was to bootstrap proteins. If a protein appeared more than once in a sample, the replicates were disregarded. The reason for bootstrapping proteins was to identify different combinations of proteins which seem to do quite well together (Amaratunga et al., 2012). Considering 300 bootstrap samples, lasso penalized continuation ratio model was

implemented for each bootstrap sample. To analyse the results of this approach, a ratio was derived: the number of times the protein was selected by lasso divided by the number of times that particular protein appeared in the bootstrap sample. The higher the ratio, the more important the protein is likely to be.

## RESULTS AND DISCUSSION

### Univariate Analysis

From the application of continuation ratio model in univariate context, 59 proteins were declared significant as the corresponding p value was less than the considered general

threshold of 5%. Expression levels of these proteins discriminate across the three disease states potentially. However, high dimensional nature of the data causes correlation among proteins. Thus, a multi-protein analysis was accompanied to determine prime protein combinations.

### Multi-Protein Analysis

With Lasso regularization incorporated with bootstrapping proteins, the corresponding ratio was obtained for each protein. Shown in table 1 are the top 20 proteins with the highest significant ratios arranged in descending order.

Table 1 – Results of Lasso regularization with bootstrapping

Protein	Frequency	Significant	Ratio	Protein	Frequency	Significant	Ratio
P92	190	190	1	P140	197	68	0.35
P22	189	189	1	P115	187	56	0.30
P139	186	186	1	P7	192	55	0.29
P141	179	179	1	P85	199	49	0.25
P10	186	183	0.98	P128	193	48	0.25
P134	171	162	0.95	P123	181	42	0.23
P20	184	156	0.85	P101	203	29	0.14
P69	173	101	0.58	P62	199	29	0.15
P38	183	84	0.46	P100	184	24	0.13
P132	185	84	0.45	P76	177	21	0.12

Columns “Frequency” and “Significant” of table 2 represents the number of times a protein appeared in the bootstrap sample and the number of times it was picked by lasso respectively. These 20 proteins are prime since it indicates that these are doing quite well together. Considering the top four dominant proteins, each time the corresponding protein appeared in the bootstrap sample, its expression levels have become striking all the time. However, exploring low ratio proteins where its expression levels have not been picked each time it appeared in the bootstrap sample, the reason is the contribution from the presence of more dominant proteins have become prominent. To further elaborate, say two proteins are important but they are correlated, then if both proteins are present in the bootstrap sample, lasso regularization

would pick only one because the second protein adds to the trend only, but it is not very vital on its own. Thus, the multi-protein analysis revealed protein combinations that join forces.

### Comparison of Univariate and Multi-Protein Results

Results from univariate and multi-protein approaches were linked. Considering the 59 proteins whose expressions levels were declared significant in univariate context and the top 20 proteins that were picked at least 10% of the time in multi-protein context, an intersection was taken. This compounding result revealed, not just proteins with high ratios but also low ratio proteins have become significant in the univariate trend test. Thus, this confirms on the potential ordinality

suspected of these proteins during the univariate context. This too implies that, though some proteins became significant in univariate context that should not necessarily be the case of the multi-protein circumstance. The presence of ruling proteins can be more prominent. These identified top 20 proteins can be considered as the most dominant and important proteins that can separate out the disease condition in an ordinal manner. Principal component analysis was applied to these 20 supreme proteins. Considering eigen values, it was computed that a decent percentage of approximately 66% of cumulative proportion of variance could be explained by the first two principal components. A score plot was visualized considering the first two principal components as shown in figure 1, and an ordinal separation was observed across the disease states with decent clarity. Though a minor disruption exists between the mild and severe groups, it is noticeable that the ordinal subject separation is superiorly enhanced.

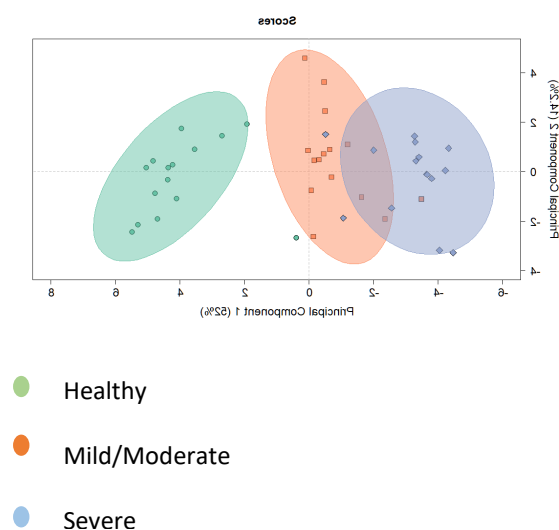


Figure 1 – Score plot for the 45 subjects with the top 20 selected proteins

## CONCLUSION

It can be concluded that the identified best featured 20 proteins, P92, P22, P139, P141, P10, P134, P20, P69, P38, P132, P140, P115, P7, P85, P128, P123, P101, P62, P100 and P76 have the capability to discriminate the disease condition in an ordinal manner satisfactorily. Thus, this paper has presented a methodology for analysing high dimensional data which have an ordinal response. It is costly and labour intensive to validate biological experiments (Langley & Mayr, 2015). Statistically prioritizing

critical proteins is always encouraged. Since the top 20 identified proteins could differentiate between the disease severity satisfactorily, this would be helpful to pinpoint biomarkers and therapeutic targets for future diagnostics.

## REFERENCES

- Amaratunga, D., Cabrera, J., Cherckas, Y., & Lee, Y.-S. (2012). *Ensemble classifiers* (pp. 235–246). <https://doi.org/10.1214/11-imscol816>
- B Alberts, A Johnson, J. L. (n.d.). Studying Gene Expression and Function - Molecular Biology of the Cell - NCBI Bookshelf. In *Molecular Biology of the Cell. 4th edition*. <https://www.ncbi.nlm.nih.gov/books/NBK26818/>
- Efron, B. (1992). *Bootstrap Methods: Another Look at the Jackknife*. June 1977, 569–593. [https://doi.org/10.1007/978-1-4612-4380-9\\_41](https://doi.org/10.1007/978-1-4612-4380-9_41)
- Hesterberg, T. (2011). Bootstrap. *Wiley Interdisciplinary Reviews: Computational Statistics*, 3(6), 497–526. <https://doi.org/10.1002/wics.182>
- Langley, S. R., & Mayr, M. (2015). Comparative analysis of statistical methods used for detecting differential expression in label-free mass spectrometry proteomics. *Journal of Proteomics*, 129, 83–92.
- Liu, X. (2010). *Ordinal Regression Analysis: Fitting the Continuation Ratio Model to Educational Data Using Stata Design*.
- Lubomirski, M., D'Andrea, M. R., Belkowski, S. M., Cabrera, J., Dixon, J. M., & Amaratunga, D. (2007). A consolidated approach to analyzing data from high-throughput protein microarrays with an application to immune response profiling in humans. *Journal of Computational Biology*, 14(3), 350–359.
- Rusling, J. F., Kumar, C. V., Gutkind, J. S., & Patel, V. (2010). Measurement of biomarker proteins for point-of-care early detection and monitoring of cancer. *Analyst*, 135(10), 2496–2511.

Tibshirani, R. (1996). Regression Shrinkage and Selection Via the Lasso. *Journal of the Royal Statistical Society: Series B (Methodological)*, 58(1), 267–288.

Yang, Q., Zhang, Y., Cui, H., Chen, L., Zhao, Y., Lin, Y., Zhang, M., & Xie, L. (2018). dbDEPC

3.0: the database of differentially expressed proteins in human cancer with multi-level annotation and drug indication. *Database: The Journal of Biological Databases and Curation*, 2018(2018).



## Factors Affecting Corona Deaths in Sri Lanka: Time Series Modeling Approach

Wathsala W.A.D.R<sup>1\*</sup> and Peiris T. S. G.<sup>2</sup>

Beira Brush PVT LTD, No.278/4, Level 17, Access Towers, Union Place, Colombo 21<sup>\*</sup> & Department of Mathematics and Statistics, Faculty of Humanities & Sciences, SLIIT, Malabe<sup>2</sup>

### ARTICLE INFO

#### Article History:

Received Date: 01 July 2022

Accepted Date: 15 September 2022

#### Keywords:

COVID-19, Modeling deaths, Stepwise procedure, Stringency Index

#### Citation:

Wathsala W.A.D.R and Peiris T. S. G. (2022). *Factors Affecting Corona Deaths in Sri Lanka: Time Series Modeling Approach*. Proceedings of SLIIT International Conference on Advancements in Sciences and Humanities, (11) October, Colombo, 212 - 219.

### ABSTRACT

Whole world has been affected by COVID-19 Pandemic which kills people on a large scale. Identifying, controlling and taking preventive actions for the factors that cause such deaths is crucial. This work intends to investigate the factors affecting COVID-19 deaths reported in Sri Lanka, during the period of 2020 to 2021 by using Vector Auto Regressive model. The empirical results of the model indicated the factors that significantly affected COVID-19 deaths short term as well as long term. Short term, factors such as increase in reported new cases in the previous day, positive number of test results, additional hours per day spent at residence compared to the median value of duration stayed at residence from 3rd January to 6th February 2020 (difference between the actual hours and median hours spent at residence has been considered), number of new visitors to outdoor places and a decrease in previous day's deaths. In a long term forecast, variables such as reproduction rate, new vaccination doses, stringency index, additional time spent at residence, new users of public transport, new users of retail and recreation and new visitors to outdoor spaces significantly influence on the mortality. The Granger Causality test confirmed the past values of new cases and positive number of tests have a predictive ability in determining the present values of deaths. On the other hand, the Variance Decomposition method indicated that the variation in deaths in short term is due to deaths itself.

\* Wathsala, Rashmi@beirabrush.com



## INTRODUCTION

Corona Virus refers to a large family of different viruses which infect both humans and animals but most of them are not dangerous. But in early 2020, after an outbreak in China December 2019, the World Health Organization identified SARS-CoV-2 as a new type of coronavirus. COVID-19 is a disease caused by SARS-CoV-2 that can trigger what doctors call a respiratory tract infection. Unlike flu, people are not immune to this virus because it is new and causes higher rates of severe illnesses and deaths (WebMD, 2021).

COVID-19 being speculated to be originated in bats and it has made the jump to humans at one of the Wuhan open air markets (UKRI, 2020). The virus mainly spreads from person to person. The droplets spread from exhalation and touching the different surfaces. Virus can last several hours on those surfaces such as copper (4hours), cardboard (up to 24 hours), Plastic (2 to 3 days), stainless steel (2 to 3 days). Human activities, such as the wild game animal trade, intensive livestock industry, urbanization, international travel and trade, environmental and ecological degradation and climate change may influence the spread (Morens & Facui, 2020).

COVID-19 has taken its toll on the world; causing deaths, illnesses and economic despair. It has an impact on all aspects of lives and threatened to push millions into poverty. "In 2021, the average incomes of people in the bottom 40% of the global income distribution were 6.7%, lower than the pre-pandemic projections, while those of people in the top 40% have dropped by 2.8%". Pandemic has harmed the poor the most. The poorest 40% have not yet started to recover their income losses. As a result, the overall poverty rate has increased from 7.8% to 9.1% globally (WBB, 2020).

The ravages of COVID-19 will also affect inequality and social mobility in the long run. Job losses among the most vulnerable workers, including women and youth affect their productivity and income growth even as economies revive. In addition, the severe impacts seen for small and micro enterprises can lead to the erosion of entrepreneurial capital and jobs that can be hard to reverse. A large share of children in poorer families had almost no access to learning opportunities during school closures in developing countries,

leading to disparities in learning that could further reduce intergenerational mobility (WBB, 2022).

Counties all over the world have taken several actions to lower the pandemic transmission rate by wearing face masks, washing hands often, keeping common surfaces clean, limiting contact with other people, lockdowns, closure of businesses, schools, bars and restaurants, social distancing measures, mask-testing, tracking and quarantine and getting vaccinated (Science Direct & WHO, 2022). A recent analysis shows that countries that adopted lockdowns when COVID-19 cases were few experienced much better epidemiological outcomes than those that intervened when cases were already high. A retrospective analysis in eleven European countries showed that lockdowns were effective in reducing transmission driving the reproduction number below one (Flaxman, 2020).

There is a responsibility of every person in the society to help to break the chain of transmission of COVID-19 infection not only the health workers. Individual freedom and individual rights taking precedence over responsibility and lack of accountability may have contributed to the spread. Some of the countries with world's best medical systems reported highest number of corona deaths like Canada and US (Our World in Data, 2021). It is imperative to identify the primary social, economic, environmental, demographic, ethnic, cultural and health factors contributing towards COVID-19 infection and mortality numbers to facilitate mitigation and control measures. If the corrective actions were taken at the 1<sup>st</sup> wave it will not have been extended for 2<sup>nd</sup> and 3<sup>rd</sup> waves. Resource allocation to the health sector and strengthen the national policies in order to fight against the pandemic should be highlighted. Late reaction to the crisis and lower Institutional trust were associated with higher COVID-19 mortality (Oksanen et al., 2020). Therefore, it is important to find a model tool to predict the most influential factors or explain trends.

This pandemic has caused significant damage to Sri Lankan population and economy with 16,000 deaths and 0.66 million reported cases till the end of April 2022 (WHO, 2022). In Sri Lanka, the first case of Covid-19 was reported in late January 2020 (WHO, 2020). Then the government introduced various sequential measures to improve social distancing imposing



island-wide curfew closing schools, institutes, factories, and offices. The first death in Sri Lanka was reported on March 28<sup>th</sup>, 2020 (WHO, 2020). False information worsened the situation. In 2020, a fewer number of PCR tests and deaths reported in the South East Asian counties. Except for Singapore, other southeast Asian countries carried out less than 5% of PCR tests per million populations; as a result of which only a few patients were detected. This erroneous policy continued till late October 2020 where Sri Lankan authorities delayed to demonstrated that it had broad community spread since May 2020 (NSF, 2021). The COVID-19 Stringency Index revealed that Sri Lanka's expansive stringent measures as 97% successful within two weeks of discovering the second COVID-19 patient in the country (Jayatilleke et al., 2020). A similar index, the Global Response to Infectious Disease (GRID), also confirmed the effectiveness and efficiency of the health systems' preparedness to address the COVID-19 pandemic in the country. Accordingly, Sri Lanka was ranked in the 10<sup>th</sup> place, demonstrating its efficiency and effectiveness in the GRID (Souza, 2020). These sources have shown satisfactory results from Sri Lanka compared to other neighboring countries in the region.

In a study, Khairan et al., (2022) proposed the VAR model to predict new deaths based on the reported new cases and applied the model to UAE, Saudi Arabia, and Kuwait. It has achieved a high level of accuracy that is superior to many existing methods. Moreover, Singh (2020) found that the ARIMA (0,1,0) to be the best fit for predicting the trend of daily confirmed COVID-19 in Malaysia. The authors use the data from January 22<sup>nd</sup> to March 31<sup>st</sup>, 2020, for training and April 1<sup>st</sup> to April 17<sup>th</sup>, 2020, for testing. Sahai in 2020 attempted to estimate the total daily infected cases from the top five Covid-19 affected countries of US, Brazil, India, Russia, and Spain. The authors obtained different optimal ARIMA models for each country respectively: (4,2,4), (3,1,2), (3,0,0), (4,2,4), and (1,2,1).

However, this analysis was conducted in order to investigate numerous factors affecting the deaths which have not been reported so far with the available secondary data collected by Johns Hopkins University, USA. (Our World in Data, 2021).

## METHODOLOGY

This study is carried out with data available on "Our World in Data" website sourced from the COVID-19 data repository by the Center for Systems Science and Engineering (CSSE) at the Johns Hopkins University in United States of America. Data has been collected from March 2020 to August 2021. SPSS and Eviews (statistical packages) were used to develop the VAR model with quantitative analysis. The collected variables are the daily reported number of deaths (Y) analyzed against the number of new cases identified ( $X_1$ ), reproduction rate/number ( $X_2$ ), positive number of tests out of the total tests conducted on daily basis by hospitals and other responsible institutions ( $X_3$ ), number of new vaccination doses distributed among public ( $X_4$ ), stringency index value ( $X_5$ ) during the pandemic situation.

Further, several variables were used and those values have been calculated as a deviation from the baseline value (of median taken for 5-week period from January 3<sup>rd</sup> to February 6<sup>th</sup> 2020) such as, additional time(hours) spent at residential ( $X_6$ ), new number of users of public transport ( $X_7$ ), new number of customers and visitors travelled to the various places during the time period. Those places were namely; retail and recreation locations ( $X_8$ ), Groceries and Pharmacies ( $X_9$ ), Parks and Outdoor spaces ( $X_{10}$ ) and Workplaces ( $X_{11}$ ).

Stringency index refers to composite measure of nine of the response metrics such as school closures, workplace closures, cancellation of public events, restrictions on public gatherings, closures of public transport, stay-at-home requirements, public information campaigns, restrictions on internal movements and international travel controls. The index on any given day is calculated as the mean score of the above nine metrics, each taking a value between 0 and 100. A higher score indicates a stricter response (i.e. 100 = strictest response).

The reproduction number  $R_t$  is a key epidemiological parameter evaluating transmission potential of a disease over time. It is defined as the average number of new infections caused by a single infected individual at time "t" in a partially susceptible population,  $i_t$  refers to the real daily number of new infections.  $\Phi_s$  is sometimes called "generation time" represents the probability

distribution of the time between infection of a primary case and infections in secondary cases.

$$R_t = \frac{\hat{l}_t}{\sum_{s=f_0}^f i_{t-s} \Phi s}$$

The VAR process is traditionally used to model together two or more related time series. In case of COVID-19, numerous variables were related to the number of deaths. For instance, when the number of new cases increases, so does the number of deaths. Therefore, information about the former can help predict the latter. The VAR process allows to incorporate all those independent variables and deaths into a single model, producing a more powerful forecasting paradigm. In addition, the VAR process requires minimal assumptions about the nature of the time series.

A good introduction to vector auto regression can be found in Time series analysis by (HamilJ.D,2020). Let  $y_t$  be a vector-valued time series consisting of  $k$  individual time series. Assume that  $y_t$  is stationary, i.e., the cross-covariance function  $\text{Cov}(y_{t+i}, y_{s+j})$  depends only on  $s-t$ . Then, the VAR( $p$ ) model is given by the following equation:

$$y_t = c + A_1 y_{t-1} + A_2 y_{t-2} + A_3 y_{t-3} + \dots + A_p y_{t-p} + e_t$$

The variables of the form  $y_{t-i}$  indicate that variable's value in " $i$ th lag" of  $y_t$ . The variable  $c$  is a  $k$ -vector of constants serving as the [intercept](#) of the model.  $A_i$  is a [time-invariant](#) ( $k \times k$ )-matrix and  $e_t$  is a  $k$ -vector of [error](#) terms. The error terms must satisfy three conditions:

1.  $E(e_t) = 0$ . Every error term has a [mean](#) of zero.
2.  $E \begin{pmatrix} e_t & e'_t \end{pmatrix} = \Omega$ . The contemporaneous [covariance matrix](#) of error terms is a  $k \times k$  [positive-semidefinite matrix](#) denoted  $\Omega$ .
3.  $E(e_t e'_{t-k}) = 0$  for any non-zero  $k$ . There is no [correlation](#) across time. In particular, there is no [serial correlation](#) in individual error terms.

The coefficients of matrix  $A_i$  are estimated based on the maximum likelihood estimation.

## RESULTS AND DISCUSSION

### Descriptive Statistics

Basic statistics of the dependent variable and 11 explanatory variables are shown in Table 1.

Variable	Mean	Std. Error
Y	11	0.96
X <sub>1</sub>	636	38
X <sub>2</sub>	1.05	0.01
X <sub>3</sub>	627	37.24
X <sub>4</sub>	89,414	10,567
X <sub>5</sub>	64.05	0.99
X <sub>6</sub>	17.5	0.46
X <sub>7</sub>	-30	0.93
X <sub>8</sub>	-33	0.98
X <sub>9</sub>	-15	1.09
X <sub>10</sub>	-22	0.67
X <sub>11</sub>	-31	0.73

Table 1. Descriptive Statistics

As per the data collected from 1st of March 2020 to 10th of August 2021, the mean number of deaths reported per day is 11 with SE (Standard error) of 0.96. New cases were reported with average of 636 new cases per day with 38 SE. At least one new person got infected daily from an already infected person since the mean re-production rate is 1.05 per day with 0.01 SE. 627 positive test results were reported averagely per day, with 37.24 SE. Almost 90,000 vaccination doses have been distributed daily as per the table with 10, 567 SE. Stringency has varied with mean of 64.05 and 0.99 SE. Compared to the baseline, averagely 17.5 additional time has been spent at their residencies by people. Negative mean values of the X<sub>7</sub>, X<sub>8</sub>, X<sub>9</sub>, X<sub>10</sub>, X<sub>11</sub> variables indicate that the tendency of people moving out of their residences has been reduced compared to the median value (from January 3rd to February 6th 2020) with low standard errors compared to most of other variables. The mean of some variables is negative, because those have been compared with a baseline value. Thus, means were taken as the mean deviation from the corresponding baseline values.

### Association between reported deaths and other variables

All explanatory variables have significantly correlated with the dependent variable except

X2, X8 and X9. However, with X1, X3 X4 X5 and X6 variables, there is a strong positive correlation while others have negatively correlated (Table 2).

Table 2. Association between the number of deaths and other variables

Explanatory variable	Correlation Coefficient	P value
X <sub>1</sub>	0.791	0.000
X <sub>2</sub>	0.014	0.752
X <sub>3</sub>	0.804	0.000
X <sub>4</sub>	0.508	0.000
X <sub>5</sub>	0.374	0.000
X <sub>6</sub>	0.252	0.000
X <sub>7</sub>	-0.216	0.000
X <sub>8</sub>	-0.065	0.149
X <sub>9</sub>	0.045	0.315
X <sub>10</sub>	-0.09	0.044
X <sub>11</sub>	-0.234	0.000

Lag 1 obtained as the optimum lag length of model with both SC and HQ methods, (Table 3) while AIC method obtained a value of lag 6. Due to the increment in standard error during the higher lag levels, the study has been proceeded with lag 1 as SC and HQ methods suggested.

Table 3. VAR Lag order selection criteria at Lag 1

Akaike information criterion	68.14
Schwarz criterion	70.14
Hannan Quinn	68.95

Summarized results in Table 4 indicate that there are unidirectional causalities running from X1, X3 and X4 implying that past values of X1, X3 and X4 have a predictive ability in determining the present values of deaths with 95% level of confidence.

Table 4. Results of Ganger Causality Test

Null Hypothesis:	F-Statistic	Prob.
X <sub>1</sub> does not Granger Cause Y	18.638	0.0000
X <sub>2</sub> does not Granger Cause Y	0.3365	0.7144
X <sub>3</sub> does not Granger Cause Y	16.3006	0.0000

X <sub>4</sub> does not Granger Cause Y	2.42123	0.0931
X <sub>5</sub> does not Granger Cause Y	0.89243	0.4103
X <sub>6</sub> does not Granger Cause Y	0.50771	0.6022
X <sub>7</sub> does not Granger Cause Y	0.25351	0.7762
X <sub>8</sub> does not Granger Cause Y	0.02235	0.9779
X <sub>9</sub> does not Granger Cause Y	0.12503	0.8825
X <sub>10</sub> does not Granger Cause Y	0.02448	0.9758
X <sub>11</sub> does not Granger Cause Y	0.41085	0.6633

### Stationary of the series

Results in Table 5 indicate that all the variables are stationary at first difference (as per Dickey fuller test results with p value < 0.05) and there is no co-integration for the optimum lag order (lag1), and so vector auto regressive (VAR) model can be fitted for the variables. The fitted VAR model (order of the model lag 1) for the period is given in equation (1). The values of the coefficients are shown in Table 5.

$$Y = C1*Y(-1) + C2*X1(-1) + C3*X2(-1) + C4*X3(-1) + C5*X4(-1) + C6*X5(-1) + C7*X6(-1) + C8*X7(-1) + C9*X8(-1) + C10*X9(-1) + C11*X10(-1) + C12*X11(-1) + C13 \dots \dots \dots (1)$$

The short run dynamics among these variables can be evaluated by examining the significance and sign of the estimated lagged coefficients of the VAR model, which is presented in Table 5.

It is observed that the estimated short run coefficient of the variables indicates that only X1, X3, X6, X10, X11 and Y itself are statistically significant at 10% level of confidence with current level of Y. Hence it is evident that above variables of the previous day have a significant influence on the short run Y value.

Table 5. Results of Dicky Fuller Test

Variable	Level		1st Difference	
	t-Stat	Probability	t-Stat	Probability
Y	2.99	1.00	(21.96)	0.00
X <sub>1</sub>	(0.49)	0.89	(21.19)	0.00
X <sub>2</sub>	(4.70)	0.00	(7.43)	0.00
X <sub>3</sub>	(0.76)	0.83	(6.10)	0.00
X <sub>4</sub>	0.95	1.00	(4.94)	0.00
X <sub>5</sub>	(2.54)	0.11	(21.92)	0.00
X <sub>6</sub>	(3.03)	0.03	(4.58)	0.00
X <sub>7</sub>	(3.20)	0.02	(4.46)	0.00
X <sub>8</sub>	(3.39)	0.01	(4.23)	0.00
X <sub>9</sub>	(3.58)	0.01	(3.72)	0.00
X <sub>10</sub>	(3.08)	0.03	(4.78)	0.00
X <sub>11</sub>	(3.25)	0.02	(5.40)	0.00

Table 6. Vector auto regressive model

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-0.204029	0.0882	(2.3126)	0.0209
C(2)	0.009087	0.0055	1.6669	0.0957
C(3)	-18.79957	13.2811	(1.4155)	0.1571
C(4)	0.0171	0.0066	2.6057	0.0093
C(5)	-6.68E-06	0.0000	(0.3374)	0.7359
C(6)	0.026043	0.1839	0.1416	0.8874
C(7)	2.909663	1.4822	1.9630	0.0498
C(8)	-0.272694	1.1117	(0.2453)	0.8063
C(9)	-0.247498	1.1617	(0.2130)	0.8313
C(10)	-0.614719	0.4667	(1.3173)	0.1879
C(11)	2.905369	0.6114	4.7519	0.0001
C(12)	1.799755	0.5947	3.0262	0.0025
C(13)	71.50184	19.8052	3.6103	0.0003

## CONCLUSION

This study analyzed the daily collected data from the 1st, 2nd and 3rd waves of the COVID-19 spread from the period of 1st of March 2020 to 10th of August 2021 with the intention of investigating the factors affecting COVID-19 deaths in Sri Lanka with Time series model approach. The empirical results of the model indicate that all the variables are stationary at their 1st difference and there is no co-integration for the optimum lag order (Lag 1), VAR model can be fitted for the variables. Therefore, increase in previous days reported new cases, positive number of tests, additional time spent at residence, new visitors to parks/ outdoor places have a significant influence on the short run increment of the deaths. Therefore, government implemented various travelling restrictions and increased the

number of tests in order to detect and isolate the patients infected with the virus.

Granger Causality test confirms that the past values of new cases and positive number of tests have a predictive ability in determining the present values of deaths. Variance Decomposition method indicates that the variation in deaths in short term horizon is due to deaths themselves and while for a long term, the forecast of deaths will be affected by reproduction rate, new vaccination doses, stringency index, additional time spent at residence and by using public services or locations. Although taking the first difference stabilized the mean of the series around zero, additional transformations can be applied to improve the variance. Alternative VAR models may also be investigated in future research.

## REFERENCES

- Oksanen, M. Kaakinen, R. Latikka, L. Savolainen, N. Savela and A. Koivula (2020). "Regulation and Trust", a 3 Month Follow-up Study on COVID-19 Mortality in 25 European Countries. Published on April 2020.
- BMC Geriatrics, a retrospective cohort study of "Age is the main determinant of COVID-19 related in-hospital mortality with minimal impact of pre-existing comorbidities ". Research published on 5th March 2022. Article number: 184 (2022).
- Souza, C, D. (2020). "GRID Index: Tracking the Global Leadership Response in the COVID-19 Crisis. ". Published for National Library of Medicine on 2020 September.
- Fernando, D., Jayasekara, D., Fernando, G.L. and Seneviratne, S. L. (2020). "COVID-19: an update on clinical practice and vaccine findings from the Americas" Published for NSF in 2021 in Section 1: Keynote and Plenary Papers.
- D.M. Morens and A.S. Facui, "Emerging Pandemic Diseases: How We Got to COVID-19 ". Published for National Library of Medicine on 2020 September.
- Health Promotion Bureau known as HPB "Live Situational Analysis Dashboard of Sri Lanka for COVID-19 data". Data collection from 2019 to present.
- M. Flaxman, "A statistical analysis of the novel coronavirus (COVID-19) in Italy and Spain". Journal published on March 25th, 2021.
- National Institute of Health known as NIH, "Urbanization and Disease Emergence: Dynamics at the Wildlife–Livestock–Human Interface" A document published on 2017 Jan; 32(1): 55–67.
- National Institute of Health (NIH), SARS-CoV-2: Recent Variants and Clinical Efficacy of Antibody-Based Therapy. Document published on online 2022 Feb 14.
- National Institute of Health (NIH), "SARS-CoV-2: Psychological impact of COVID-19 pandemic in the Philippines". Document published on Published online 2020 August-24.
- National Science Foundation of Sri Lanka, "COVID 19: Impact, Mitigation, Opportunities and Building Resilience".
- Our World in Data (2021), data set for Coronavirus Pandemic and Deaths.
- Our World in Data (2021) data set for Canada: Coronavirus Pandemic Country Profile.
- Science Direct. (2022). " what have European countries done to prevent the spread of COVID-19? Lessons from the COVID-19 Health system response monitor".
- Spine Invention Society, " Covid-19 Vaccination Sri Lankan Approach". Researched and Conceptualized by State Intelligence Service published on 2020.
- UK Research and Innovation, "What is Coronavirus? The different types of coronaviruses" Article published on 25th March 2020.
- WHO reports from 2020 to 2022, Coronavirus Disease (COVID-19) Situation Reports.
- WebMD, American online publisher for news and information report on Coronavirus and COVID-19 Overview a Medically Reviewed by doctor Brunilda Nazarian.
- World Bank Blogs in the Year in Review report, The impact of COVID-19 in 12 charts. Article published on December 14, 2020.
- Yonzan, N., Colocar, A., Lakner, C., Mahler, D., Narayan, A. (2022). World Bank Blogs. The impact of COVID-19 on poverty and inequality. Evidence from phone surveys published on January 18, 2022.
- K. Rajab (2022). Forecasting COVID-19: Vector Auto Regression-Based Model.
- Hamilton J.D (2020). Time Series Analysis. Princeton: Princeton University Press; 2020.

Singh S, Sundram BM, Rajendran K, Law KB, Aris T, Ibrahim H, Gill BS. Forecasting daily confirmed COVID-19 cases in Malaysia using ARIMA models. *J. Infect. Dev. Ctries.* 2020;14(09):971–976. doi: 10.3855/jidc.13116.

Sahai AK, Rath N, Sood V, Singh MP. ARIMA modelling & forecasting of COVID-19 in top five affected countries. *Diabetes Metabol. Syndr. Clin. Res. Rev.* 2020;14(5):1419–1427. doi: 10.1016/j.dsx.2020.07.042.



## Modeling and Forecasting of the Weekly Incidence of Dengue in Colombo District of Sri Lanka

Arachchi K. A. N. L. K.<sup>1\*</sup> and Peiris T. S. G.<sup>2</sup>

<sup>1</sup>Teaching Hospital, Nagoda, Kalutara & Department of Mathematics and Statistics, Faculty of

<sup>2</sup>Humanities and Sciences, SLIIT, Malabe

### ARTICLE INFO

#### Article History:

Received Date: 01 July 2022

Accepted Date: 15 September 2022

#### Keywords:

ARIMA, Dengue, Time series analysis

#### Citation:

Arachchi K. A. N. L. K. and Peiris T. S. G. (2022). *Modeling and Forecasting of the Weekly Incidence of Dengue in Colombo District of Sri Lanka*. Proceedings of SLIIT International Conference on Advancements in Sciences and Humanities, (11) October, Colombo, 220 - 225.

### ABSTRACT

This study was designed to develop a time series model for the weekly incidence of dengue in the Colombo district of Sri Lanka. Weekly occurrence of dengue fever counts from January 2015 to August 2020 in the Epidemiological Report by the Ministry of Health was used for the study. ARIMA (2,1,0) with the addition of AR (16) was identified as the most effective model. The model was trained using data from January 2015 to December 2019. The balance data was used to validate the model. The residuals of the model satisfied the randomness and constant variance, but the residuals significantly deviated from the normality. The results showed that the forecasted figures were consistent with the observed series. However, a noticeable percentage error was observed sequentially in the late 2020s. Those errors could be attributable to the fact that there was an underreporting of dengue fever cases due to social and operational shocks of the Covid-19 Pandemic.

\* Arachchi, nkarasinghe@gmail.com

## INTRODUCTION

Dengue is a disease of public health concern transmitted by mosquitos known as *Aedes aegypti* and *Aedes albopictus*. Being the vector is an arthropod having a lifecycle with aquarium stages, the transmission of the disease depends on climate factors (Colón-González et al., 2021) such as rainfall, humidity, temperature, and winds. Since the disease transmission needs to have contact between the vector and the host, the incidence of dengue is also affected by the behavior and exposure of the host. Therefore, dengue is a viral disease that gets transmitted by vector mosquitos, the pattern of which can get affected by seasonal variations of climate factors, the behavior of the hosts (people), and the vectors themselves.

Since viral diseases have a spectrum of manifestations from non to severe, those only with clinical symptoms are identified and reported. The ability of the virus to affect the hosts in a way that they manifest detectable symptoms is based on their ferocity known as virulence.

Due to the above facts, the prevalence and incidence of dengue are multifactorial and can be seasonal. These characteristics have attracted many authors to do statistical analysis that attempts to describe the epidemiology of the disease with some forecasts. However, most of such attempts are situational and more localized than generalized, making their use very limited (Johansson et al., 2019). Nevertheless, many authors have attempted to describe the disease and its forecasts based on observable parameters. They rarely have focused on estimating the effects of invisible factors like virulence of the viral strain, behavioral patterns of the host and the vector, and immunity of the population. One reason for such rarity is the inability to measure them accurately unless mathematical modeling is attempted as was done by Hartley et al., (2002). Therefore, many authors have attempted univariate time series analysis which consists of observations of a single variable recorded sequentially over time. Box Jenkins model approach (Box et al., 2015) is one such method that many authors have attempted. The analysis of this study was also based on the method proposed by Box et al., (2015).

Seasonal Autoregressive Integrated Moving Average (SARIMA), Wavelet Time Series, General Additive Mixed (GAM) models, Spatial

analysis, Non-linear methods, Multivariate modeling, and Global Circulation models have been used to model and project the communicable disease occurrence like dengue (Naish et al., 2014). Of them, ARIMA modeling is a popular method for statistical forecasting of time series data. Dom et. al., (2013) forecasting the incidence of dengue in a selected region of Malaysia using ARIMA modeling on the weekly number of cases, concluded that ARIMA modeling is particularly important as a tool in decision-making for disease control and prevention. Shah and Sani (2011) also stated that the incidence of dengue can be accurately predicted by using time series modeling.

However, the work that has been done to model and forecast the incidence of dengue in Sri Lanka is comparatively less. The objective of this study is therefore to develop a time series model for weekly incidence of dengue in the Colombo district of Sri Lanka.

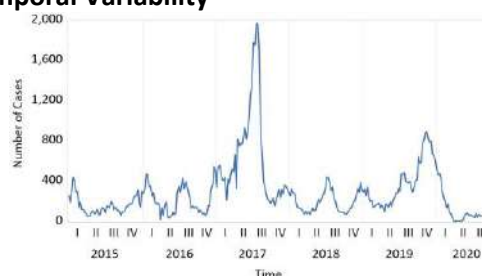
## MATERIALS AND METHODS

The reported cases of weekly dengue fever from the 01st of January 2015 to the 30th of August 2020 were extracted (296 points) from Weekly Epidemiological Reports (WER) published by the Epidemiology Unit (Epid Unit) of the Ministry of Health, Sri Lanka.

ARIMA models were developed using EViews software and the best-fitted model was selected based on standard indicators. The first original data series was tested for stationary using Dicky Fuller test and then stationary was obtained using first differenced series. Based on the ACF and PACF of the stationary series, possible models were decided by comparing the theoretical ACF and PACF of the selected models. The model diagnostics of the final model were carried out for the recommended model.

## RESULTS AND DISCUSSION

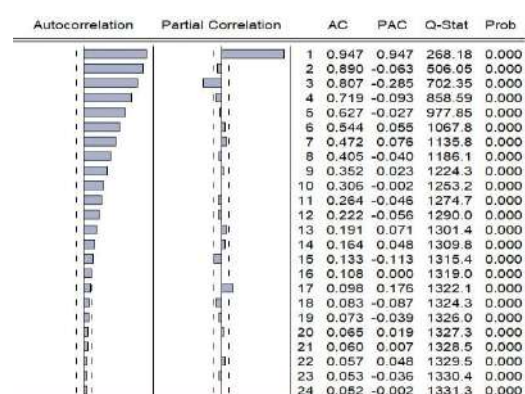
### Temporal Variability



**Figure 1.** Time series plot of the weekly incidence of dengue cases



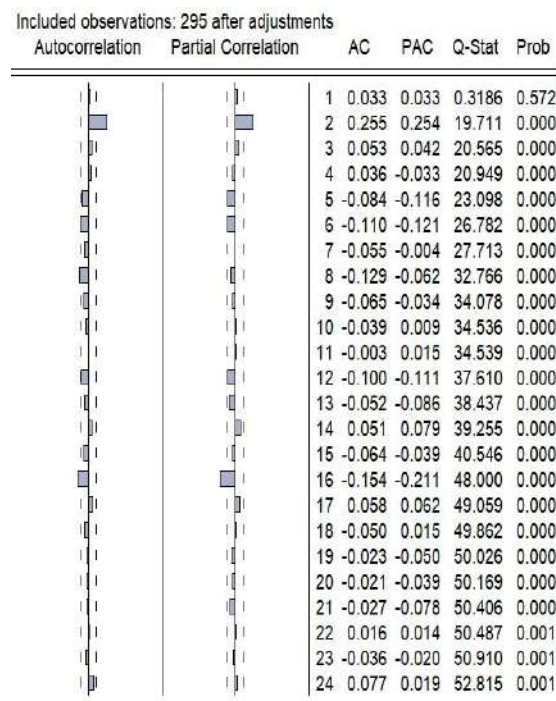
The mean number of cases per week was 295 while the median was 201. The lowest weekly incidence was 2 (1<sup>st</sup> week of April 2020) and the highest was 1972 (3<sup>rd</sup> week of July 2017). The time series plot in Fig. 1 illustrates that the original observed series was nonstationary. This was confirmed by using the ACF plot (Fig. 2) and the Augmented Dickey-Fuller (ADF) test. The null hypothesis of the ADF test is that there is a unit root in an AR model, which implies that the data series is not stationary. The correlogram of the original series (Fig. 2) confirmed its non-stationarity by indicating the ACF was significantly different from zero with a slow and gradual decline with the lags. The results of the ADF test for the original series were not significant too.



**Figure 2.** Correlogram of the original series of data

Furthermore, the pattern of ACF confirmed that there is no seasonality. To make the series stationary, the first order differencing was performed. The ADF test of the first differenced series concluded with 95% confidence that the first order differencing of the data series made it stationary as the test statistic was significant ( $p < 0.05$ ) for all three states of the test. The correlogram of the first differenced series is shown in Fig. 3.

Both ACF and PACF of the correlogram (Fig. 3) showed very rapidly decaying after lag 2, and they were statistically significant only at the same lag. Therefore, it indicated an ARIMA process underneath as both ACF and PACF had the same pattern of exponential decaying. Therefore, the following three models; ARIMA (2,1,0), ARIMA (0,1,2), and ARIMA (2,1,2) were considered the most appropriate tentative models to proceed with.



**Figure 3.** Correlogram of the first order differenced series

### Identification of the best-fitted model

A comparison of those three ARIMA models based on conventional criteria for assessing the goodness is shown in the Table. 1.

**Table 1.** Comparison of the selected ARIMA models

Indicators	Model		
	ARIMA (2,1,0)	ARIMA (0,1,2)	ARIMA (2,1,2)
Parameter-AR (1)	significant	not applicable	not significant
Parameter-AR (2)	significant	not applicable	not significant
Parameter-MA (1)	not applicable	significant	not significant

			ica nt
Parameter– MA (2)	not applic able	signifi cant	no t sig nif ica nt
$\sigma^2_{Vol}$ atility	8743. 8	8770. 2	87 38 .7 3
AIC	11.93 5	11.93 8	11 .9 40 1
SBIC	11.97 23	11.97 5	11 .9 91

Results in Table 1 indicated that all parameters in ARIMA (2,1,2) were not significant and thus it was not an appropriate model to proceed with. In both ARIMA (2,1,0) and ARIMA (0,1,2), the coefficients were significantly different from zero. The  $\sigma^2_{volatility}$  in ARIMA (2,1,0) was less than that in ARIMA (0,1,2). Furthermore, both AIC and BIC statistics in ARIMA (2,1,0) were less than the corresponding values in ARIMA (0,1,2). Therefore, ARIMA (2,1,0) was chosen as the best-fitted model of all. The ACF and PACF of the residuals of the ARIMA (2,1,0) are shown in Figure 5.

Q-statistic probabilities adjusted for 1 ARMA term

Autocorrelation	Partial Correlation	AC	PAC	Q-Stat	Prob
1	0.014	0.014	0.0566		
2	0.008	0.008	0.0776	0.781	
3	0.075	0.075	1.7645	0.414	
4	0.001	-0.001	1.7650	0.623	
5	-0.095	-0.097	4.5126	0.341	
6	-0.100	-0.105	7.5691	0.182	
7	-0.022	-0.019	7.7194	0.259	
8	-0.106	-0.091	11.147	0.132	
9	-0.059	-0.043	12.199	0.143	
10	0.018	0.015	12.301	0.197	
11	0.028	0.026	12.545	0.250	
12	-0.117	-0.128	16.773	0.115	
13	-0.040	-0.069	17.282	0.139	
14	0.127	0.101	22.335	0.050	
15	-0.075	-0.072	24.089	0.045	
16	-0.176	-0.190	33.770	0.004	
17	0.090	0.056	36.305	0.003	
18	-0.010	-0.024	36.335	0.004	
19	-0.034	-0.015	36.706	0.006	
20	-0.015	-0.048	36.775	0.008	
21	-0.015	-0.077	36.848	0.012	
22	0.003	-0.003	36.851	0.018	
23	-0.050	-0.064	37.991	0.018	
24	0.071	0.013	39.642	0.017	

Figure 5. Correlogram of the residuals of the ARIMA model (2,1,0)

As it was indicated in Figure 5, the Q-statistic probabilities concerning the ACF were not statistically significant up to lag 14.

Nevertheless, the correlogram did indicate a significance at lag 16 in both ACF and PACF. Therefore, a re-estimation was performed by adding AR (16) and MA (16) individually to ARIMA (2,1,0). Comparison of those indicators; AIC, BIC, and  $\sigma^2_{volatility}$ , it was confirmed that adding AR (16) terms was more appropriate than adding the terms of MA (16). Thus, ARIMA (2,1,0) + AR (16) was considered the best-fitted model to represent the weekly incidence of dengue in the tested series. In that case, AR(1) was found to be not significant. However, both estimates of AR (2) and AR (16) have significantly deviated from zero. Thus, a model was refitted only with AR(2) and AR(16) (Table 2). The plot of ACF for the residuals of the best-fitted model confirmed that the errors were having randomness too.

Table 2. Details of the parameters of ARIMA (2,1,2) + AR (16)

Included observations: 295  
Convergence achieved after 87 iterations  
Coefficient covariance computed using outer product of gradients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.529103	7.472788	-0.070804	0.9436
AR(2)	0.262049	0.054137	4.840446	0.0000
AR(16)	-0.163280	0.027749	-5.884273	0.0000
SIGMASQ	8475.277	308.0737	27.51055	0.0000

R-squared	0.093936	Mean dependent var	-0.637288
Adjusted R-squared	0.084596	S.D. dependent var	96.88018
S.E. of regression	92.69183	Akaike info criterion	11.91198
Sum squared resid	2500207.	Schwarz criterion	11.96197
Log likelihood	-1753.017	Hannan-Quinn criter.	11.93200
F-statistic	10.05650	Durbin-Watson stat	1.960523
Prob(F-statistic)	0.000003		

### Comparison of the observed and predicted values for both training and validation sets

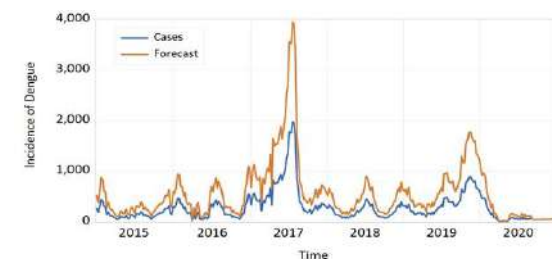


Figure 6. Forecasted and actual values of the incidence of dengue for the training data set

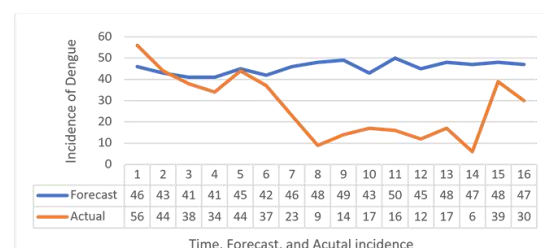


Figure 7. Forecasted and actual values of the incidence of dengue for the validation set (September-December 2020)

Although it seemed the estimations were overexpressed at some points for the training set, the pattern of the estimate was good enough for forecasting the incidence of dengue. However, almost all points were underestimated. As it was presumed that mean absolute percentage error (MAPE) is not a considerable indicator to check the forecasting power of each point, the percentage errors were computed for all points. The percentage error for the training set varied from -10% to -25%. However, for the validation set, as shown in Fig. 7 the forecasted and the actual incidence of dengue was much closer in the first six weeks, and then in the last two. However, there was a considerable gap in weeks in-between and the percentage error was over 100%. It was clear that the forecasted figures were much closer to the actual figures except for the weeks from 7 to 14. The period stipulated for the above forecast was from early September 2020 to the middle of December 2020. Therefore, it was likely that there had been an under-reporting of the dengue cases during that period. In fact, it was the period that Sri Lanka was hardly hit by the effects of the Covid-19 Pandemic. Restricted social mobility, halted human activities, particularly in the risky environments for dengue transmission, and the possibility of less prioritized attention by the public health officials over the Pandemic management, were among the potential reasons behind the shrunken incidence of dengue notified to the Epidemiology Unit.

## CONCLUSION

In the study, ARIMA (2,1,0) with an additional term of AR (16) was found to be an effective statistical model for dengue prediction and forecasting. The fitted model was tested for an independent data set and its goodness was proven. Furthermore, the errors of the model were found to be white noise. Thus, ARIMA (2,1,0) with an additional term of AR (16) is recommended to forecast the incidence of dengue in the Colombo district and so to predict the potential outbreaks of dengue in the district to have optimized responses in outbreak management. Though the inclusion of AR(16) was found to be superior than other models, it used to under estimate for the training set for all points and over estimate for the validation set. These are the typical problems in ARIMA

modelling and it is suggested to develop further to minimize such errors.

## REFERENCES

- Abualamah, W. A., Akbar, N. A., Banni, H. S., & Bafail, M. A. (2021). Forecasting the morbidity and mortality of dengue fever in KSA: A time series analysis (2006–2016). *Journal of Taibah University Medical Sciences*.
- Ali, N. A., Muhammad Pazil, N. S., Mahmud, N., & Jamaluddin, S. H. (2021). Forecasting Dengue Outbreak Data Using ARIMA Model. *International Journal of Academic Research in Business and Social Sciences*, 11(6).
- Box, G. E. P., Jenkins, G. M., Reinsel, G. C., & Ljung, G. M. (2015). *Time series analysis: forecasting and control*. John Wiley & Sons.
- Colón-González, F. J., Soares Bastos, L., Hofmann, B., Hopkin, A., Harpham, Q., Crocker, T., Amato, R., Ferrario, I., Moschini, F., James, S., Malde, S., Ainscoe, E., Sinh Nam, V., Quang Tan, D., Duc Khoa, N., Harrison, M., Tsarouchi, G., Lumbroso, D., Brady, O. J., & Lowe, R. (2021). Probabilistic seasonal dengue forecasting in Vietnam: A modeling study using super ensembles. *PLOS Medicine*, 18(3), e1003542.
- Dom, N. C., Hassan, A. A., Latif, Z. A., & Ismail, R. (2013). Generating temporal model using climate variables for the prediction of dengue cases in Subang Jaya, Malaysia. *Asian Pacific Journal of Tropical Disease*, 3(5), 352–361.
- Hartley, L. M., Donnelly, C. A., & Garnett, G. P. (2002). The seasonal pattern of dengue in endemic areas: mathematical models of mechanisms. *Transactions of the Royal Society of Tropical Medicine and Hygiene*, 96(4), 387–397.
- Johansson, M. A., Apfeldorf, K. M., Dobson, S., Devita, J., Buczak, A. L., Baugher, B., Moniz, L. J., Bagley, T., Babin, S. M., Guven, E., Yamana, T. K., Shaman, J., Moschou, T., Lothian, N., Lane, A., Osborne, G., Jiang, G., Brooks, L. C., Farrow, D. C., & Hyun, S. (2019). An open challenge to advance probabilistic forecasting for dengue epidemics. *Proceedings of the National Academy of Sciences*, 116(48), 24268–24274.

Naish, S., Dale, P., Mackenzie, J. S., McBride, J., Mengersen, K., & Tong, S. (2014). Climate change and dengue: a critical and systematic review of quantitative modeling approaches. *BMC Infectious Diseases*, 14(1).

Schwert, G. W. (1989). Tests for Unit Roots: A Monte Carlo Investigation. *Journal of Business & Economic Statistics*, 7(2), 147.

Shah, S. A., & Sani, J. A. (2011). SP6-37 Predicting dengue fever incidence in Selangor using time series analysis technique. *Journal of Epidemiology & Community Health*, 65(Suppl 1), A464–A464.

World Health Organization, & Malaria, G. P. to R. B. (2004). Using climate to predict infectious disease outbreaks: a review. *Apps.who.int*.

# Natural Sciences



## Current Status and Challenges in Using Plant-Food Waste in the Cosmetic Industry – A Case Study in the Sri Lankan Context

M.A.P.K. Thilakarathne<sup>1\*</sup>, W.D.C.C. Wijerathne<sup>2</sup>

### ARTICLE INFO

#### Article History:

Received Date: 01 July 2022

Accepted Date: 15 September 2022

#### Keywords:

Plant wastes; cosmetic; phytochemicals; food-wastage

#### Citation:

M.A.P.K. Thilakarathne, W.D.C.C. Wijerathne. (2022). *Current Status and Challenges in Using Plant-Food Waste in the Cosmetic Industry – A Case Study in the Sri Lankan Context*. Proceedings of SLIIT International Conference on Advancements in Sciences and Humanities, (11) October, Colombo, 227 - 233.

### ABSTRACT

The majority of contemporary research has focused on the cosmetic application in fresh plant materials but there is a lack of critical analyses on the potential of plant waste material for the cosmetic industry. In this regard, this study was conducted with aid the literature from the 2000-2022 period. Accordingly, we can conclude that the non-edible plant materials such as seeds and peels and food wastes contain a significant number of phytochemicals which are the key ingredient of natural cosmetic products, and low-cost as well as non-toxic ingredients for cosmetic products. But using food waste can be challenging since plants are biodegradable, before using for cosmetics it should be tested for any micro-organism activity which can affect the skin as well. Then availability and collection of waste such as soaked water, seeds, and peels will be difficult since first of all it has to be consumed in the food used in the cosmetic industry. However, the analysis result of the phytochemical content of plant waste has shown a significant value in the cosmetic industry due to their anti-inflammatory activity, antioxidant activity, anti-tyrosinase, and elastase activity for the skin.

\* M.A.P.K. Thilakarathne

## INTRODUCTION

Due to the tropical climate in Sri Lanka, many vegetables and fruits are grown in the majority of the land available. However, due to a lack of waste management strategies during harvesting and post-harvesting, large quantities of fruit and vegetable become wasted annually. Besides, around 15.84% of fruits, vegetables and grains are usually non-edible and hence removed when consumed [1]. However, these non-edible components, post-harvest wastage of fruits and vegetables, and food wastes are enriched with important phytochemicals that are useful in industrial applications such as pharmaceuticals, beverages, and cosmetics. Various phytochemicals with biological effects including anticancer, antibacterial, antioxidant, anti-antidepressant, analgesic, and wound healing activity were discovered [9].

Therefore, the main objective of this review is to focus on the investigation of the current status and challenges of using plant-food waste for cosmetic applications in Sri Lanka.

## METHODS

This review paper investigates the use of non-edible components, post-harvest wastage of fruits and vegetables, and food waste in the Sri Lankan cosmetic industry. Here, an information search was conducted in the Google Scholar database in the period 2000 to 2022, by using the keywords: “non-edible plant materials”, “Sri Lanka”, “food wastes” and “phytochemicals”. A total of 15 key works comprising journal articles, theses, conference proceedings, and book chapter was screened and analyzed in the study.

## RESULTS AND DISCUSSION

Statistics on plant-food wastage in Sri Lanka In Sri Lanka, up to 2020, approximately 210,000 MT of fruits each year, or 30 - 40% of the yield, are lost during postharvest operations which represent yearly economic losses of about US\$ 90 million. About 370,000 metric tons of vegetables are lost annually during post-harvest processes, which represents 20 to 40% of the overall yield which is equivalent to around 110 million US dollars [3]. Furthermore, a large portion of the common waste found in municipal residential regions in Sri Lanka is also caused by food waste [4]. Besides, Fruit and

Vegetable wastage in Sri Lanka is mainly caused due to home wastage. Most of the solid waste from home wastage (68%) is biodegradable waste, which consists of the fruit and vegetable waste [4]. As a tourist country, the hospitality sector in Sri Lanka is one of the biggest consumers of resources and generators of waste. Therefore, the hotel industry's massive development might lead to yet another issue with the destination's sustainable development. The amount of food waste produced by a typical hotel per year is estimated at 46.2% which indicates that, compared to other solid waste categories, the hotel industry creates a great deal of food waste.

Although this plant wastage is unable to be recycled or reused its phytochemical content is valuable for the cosmetic industry.

Phytochemical properties and application of materials found in waste

Table 1 summarizes the corresponding phytochemicals and their applications to selected plant components.

Table 01: Corresponding phytochemical compounds and applications of selected plant materials

Phytochemical compound	Plant wastes	Application in the cosmetic industry	Related works
Phenols	Used black and green tea powder, Potato peels, Pineapple waste (Peel and residual pulp), rice water, citrus peel, pomegranate peel, Grape	Sun protectors, Antiaging agents, Anti-inflammatory agents, Healing agents	[10]



	seeds and skin		
Flavonoids	Banana peel, Tomato seed, and peel, orange peel, Avocado seed, rice water	protective and cleaning effect to skin, anti-aging properties, pigment-saving activity and supportive mechanical strength to hair	[6], [8], [7], [11]
Ascorbic acid	Citrus peels, broccoli, Cabbage, and Strawberry wastes, Tomato seed and peel waste	anti-pigmentary agent, antioxidant agent, anti-aging, photoprotection against UVR, anti-inflammatory agent	[12]
Vitamin E	Cucumber seeds and waste, Tomato seed and peel waste, Grape seed	Hair growth and conditioning, inflammation activity, antiaging agent, reduce depigmentation	[8]
Carotenoids	Banana peel, rice water, sweet potato peels, Tomato seed, and peel waste, apples, carrots,	prevent the degradation of collagen, elastin and fibrillin on skin, stimulate natural mechanisms that protect the	[6], [5], [13]

	mushroom, and pumpkin wastes	skin against UV radiation, Healing agent	
alkaloids	Avocado seeds	As a skin penetrator As an anti-aging agent To improve the strength, smoothing growth, and softening of human hair. As an emulsion to make body lotion and cream	[2], [3]

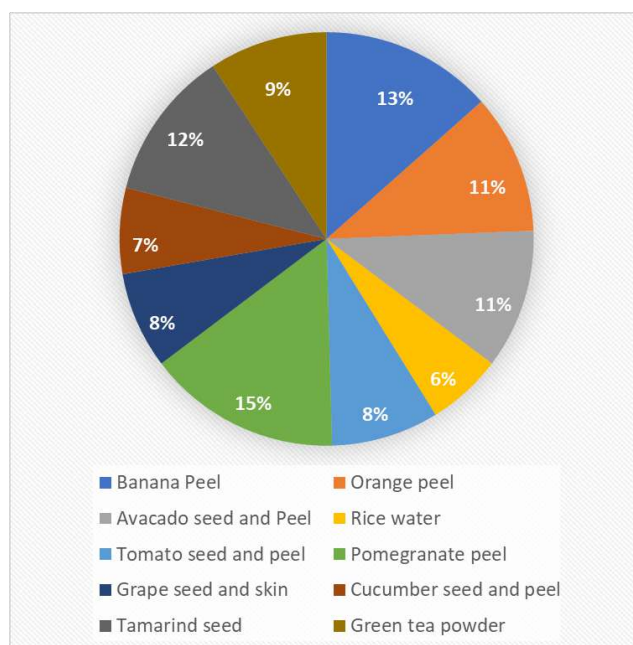


Figure 01: Phytochemical screening researches for 2015-2022 years for each plant wastes

Figure 01 elaborates the results for the amount of work done for the phytochemical screening of relevant plant material for 2015 - 2022 years. Those works were novel for each other by their used extraction technology, extracted solvent, a purpose for the screening, and stability testing for different parameters



such as moisture, and thermal. And some screenings were specific to a species of plant waste or the geological area. However, this confirmed further that this non-edible or wastage of plant materials are rich in phytochemicals.

Current progress and challenges in using plant-food waste for cosmetic industries in Sri Lanka

Sri Lanka has about 20 several leading cosmetic industries including international companies and small and medium enterprises. In their manufacturing processes, plant-based cosmetics are produced as listed in Table 2.

Table 02: Plant-based cosmetic products and their application in the cosmetic industry.

Application in the cosmetic industry	Plant material	Industry	waste form (yes/no)
Bath and shower gel	Aloe vera and lavender, Hibiscus	Industry 01	No
	Lotus, Rose, Jasmine	Industry 02	No
	Lemon grass, Lemon	Industry 04	No
	Neem and Venivel	Industry 07	No
body lotion	Aloe and lavender, Turmeric, Cucumber	Industry 01	No
	White Jasmin, Turmeric, White Rose	Industry 02	No
	Sandalwood, Venivel, Kokum Bark, Turmeric, Valmadata	Industry 03	No
	Aloe vera, Turmeric, Almond	Industry 04	No
	Aloe vera	Industry 07	No
	Hibiscus, Avocado, Jasmine	Industry 09	No
	Saffron	Industry 10	No
	Orange	Industry 14	No
Facewash	Aloe lavender, Hibiscus, Rose, Turmeric, Venivel, Tea tree oil,	Industry 01	No
	Neem and Aloe vera, Sandalwood, Pomegranate, strawberry	Industry 03	No
	Cucumber, Carrot, Papaya, Turmeric, Lotus,	Industry 04	No
	Strawberry, Neem, Tea tree oil, Papaya	Industry 05	No
	Lotus	Industry 07	No
	Aloevera, Venival, Neem, Savandara	Industry 09	No
	Red sandalwood, Saffron, Lemon grass, Green tea	Industry 10	No
	Tea Tree oil, Rose, Strawberry, Jojoba oil	Industry 11	No
	Almond, Apricot, carrot, pumpkin,	Industry 12	No
	Passion and lime, carrot, Papaya	Industry 14	No
Conditioning shampoo	Hibiscus	Industry 01	No

	Aloe Vera, Neem and Jusmin, Virgin coconut	Industry 02	No
	Onion oil and Bamboo, Honey and apple,	Industry 05	No
	Aloe vera and Neem, King coconut,	Industry 07	No
	Aloevera, Amla, King coconut, Grape, Fenugreek	Industry 08	No
	Neem, Aloe vera, Fenugreek, Godapara	Industry 09	No
	Lotus, Blackberry, Neem, Aloe vera	Industry 14	No
Under Eye Dark Circle Remover	White rice	Industry 02	No
	Almond	Industry 02	No
	Gotukola	Industry 04	No
	Aloevera, Jojoba oil	Industry 09	No
	Almond	Industry 14	No
Moisture Body Butter	Cocoa	Industry 01	No
	White Sandalwood	Industry 02	No
	Cocoa	Industry 05	No
	Cocoa and berry	Industry 09	No
	Avacado	Industry 14	No
Foot cream	Neem and Turmeric	Industry 01	No
	Aloe Vera, Neem, Gotukola	Industry 09	No
Pack and scrubs	Turmeric, Seaweeds, Venivel	Industry 01	No
	Coffee	Industry 02	No
	Chickpea and sandalwood	Industry 03	No
	Tamarind, Milk	Industry 04	No
	Apple and Honey, Wheat gram and Carrot	Industry 05	No
	Cucumber	Industry 08	No
	Jojoba beads	Industry 11	No
	White sandalwood	Industry 14	No
Acne treatments	Rose	Industry 01	No
	Neem, White Rose	Industry 02	No
	Lemon and Lime	Industry 03	No
	Aloe Vera, Tamarind, Licorice	Industry 04	No
	Tea tree and Clove	Industry 05	No
	Aloe vera, Jojoba oil	Industry 09	No
	Aloe vera, Neem	Industry 11	No
	Neem, Peppermint leaves,	Industry 14	No
Soaps	Cinnamon	Industry 01	No
	Lotus, Rose, Lavender, Neem, Sandal and Cinnamon, Turmeric and Tea tree	Industry 02	No
	Sandalwood, Lemongrass, Cinnamon Turmeric	Industry 03	No

	Cinnamon and Neem, Tea tree and clove, Shear butter and Aloe vera	Industry 05	No
Face toners	Jasmin, Turmeric, Cucumber	Industry 01	No
	Cucumber	Industry 04	No
	Hazel, Lavender, Cinnamon, Rose	Industry 11	No
	Aloe vera	Industry 12	No
	Cucumber	Industry 14	No

Cosmetic products of Industry 06, 13 and 15 did not use natural ingredients.

Accordingly, the current arena of the cosmetic industry has developed plant base cosmetic products but uses only fresh fruits and vegetables. But with increasing of the population, Sri Lanka can lead to a famine that causes the reduction in fresh plant materials as an ingredient in cosmetic products. But still, there is no evidence for sustaining food waste in the cosmetic industry. Since this food waste is also enriched with phytochemicals which are the key ingredient of beauty products, utilizing waste in the cosmetic product should gain more attention.

But using food waste can be challenging with its biodegradable, micro-organism activity, or toxicity to the skin, availability and collecting of the waste such as rice water, seeds, and peels will be difficult since first of all food has to be consumed to be used in the cosmetic industry. Micro activity may lead to producing flavors and smells that are unpleasant and degrade the quality of the final products [15]. On the other hand, food wastage from home usage, supermarket usage, and industrial wastes should be purified before use. Because the waste may contain adverse compounds such as hazardous substances, by mixing with the chemicals in industrial processes. Using non-food grade solvents in the conventional extraction processes may contaminate the plant extractions [15]. Even at very low concentrations these hazardous substances, including organic and inorganic compounds, can present a significant risk to the health of consumers [15]. Besides, some plant wastes such as waste from Olive are challenged to incorporate as active ingredients, whether used whole or in extract form because of their versatility [14].

## CONCLUSION

The current study was carried out to critically evaluate the use of non-edible components, post-harvest wastage of fruits and vegetables, and food waste in the Sri Lankan cosmetic industry. Accordingly, analysis of the phytochemical compounds of plant waste has shown a significant value in the cosmetic industry. But still, there was a lack of usage of these non-edible parts such as peel, seeds, or plant-soaked water or wastes for the cosmetic industry. Using these plant wastes in the cosmetic industry will be able to reduce as well as value addition the wastage of the environment and form non-toxic, low-cost but highly effective cosmetics. This study can be further extended by analyzing each plant material with its phytochemical compounds for various beauty products.

## REFERENCES

- Ruiz-Torralba, A., Guerra-Hernández, E., & García-Villanova, B. (2018). Antioxidant capacity, polyphenol content and contribution to dietary intake of 52 fruits sold in Spain. *Cyta - Journal Of Food*, 16(1), 1131-1138.
- Adikaram, N. (1986). SURVEY OF POST-HARVEST LOSSES IN SOME FRUITS AND VEGETABLES AND THE FUNGI ASSOCIATED WITH THE. *CEYLON: J.SCI. (BIO. SCI.)*, 19,20.
- P.G.I, D., J.W.A, S., & R.M.U.S.K, R. (2020). A Study on Fruit Wastage in Mass Scale Fruit Processing Industries in Sri Lanka and their Potential to Reuse. *Food Science & Nutrition Research*, 3(1).
- Abeynayaka, A., & Werellagama, D. (2007). Efficiency Improvement of Solid Waste Management Systems with Load Reduction: A Case Study in Kandy City, Sri Lanka. *Proceedings*

Of The International Conference On Sustainable Solid Waste Management,, 5(7), 126-133.

Marto, J., Neves, Â., Gonçalves, L., Pinto, P., Almeida, C., & Simões, S. (2018). Rice Water: A Traditional Ingredient with Anti-Aging Efficacy. *Cosmetics*, 5(2), 26.

González-Montelongo, R., Gloria Lobo, M., & González, M. (2010). Antioxidant activity in banana peel extracts: Testing extraction conditions and related bioactive compounds. *Food Chemistry*, 119(3), 1030-1039.

Ayala, J., Montero, G., Campbell, H., García, C., Coronado, M., & León, J. et al. (2017). Extraction and Characterization of Orange Peel Essential Oil from Mexico and United States of America. *Journal Of Essential Oil Bearing Plants*, 20(4), 897-914.

Savatovic, S., Cetkovic, G., Canadanovic-Brunet, J., & Djilas, S. (2010). Utilization of tomato waste as a source of polyphenolic antioxidants. *Acta Periodica Technologica*, (41), 187-194.

Altemimi, A., Lakhssassi, N., Baharlouei, A., Watson, D., & Lightfoot, D. (2017). Phytochemicals: Extraction, Isolation, and Identification of Bioactive Compounds from Plant Extracts. *Plants*, 6(4), 42.

Dias, R., Oliveira, H., Fernandes, I., Simal-Gandara, J., & Perez-Gregorio, R. (2020). Recent advances in extracting phenolic compounds from food and their use in disease prevention and as cosmetics. *Critical Reviews In Food Science And Nutrition*, 61(7), 1130-1151.

Danihelová, M., Viskupičová, J., & Šturdík, E. (2012). Lipophilization of flavonoids for their food, therapeutic and cosmetic applications. *Acta Chimica Slovaca*, 5(1), 59-69.

Ravetti, Clemente, Brignone, Hergert, Allemandi, & Palma. (2019). Ascorbic Acid in Skin Health. *Cosmetics*, 6(4), 58.

Martins, N., & Ferreira, I. (2017). Wastes and by-products: Upcoming sources of carotenoids for biotechnological purposes and health-related applications. *Trends In Food Science & Technology*, 62, 33-48.

Rodrigues, F., Pimentel, F., & Oliveira, M. (2015). Olive by-products: Challenge application in cosmetic industry. *Industrial Crops And Products*, 70, 116-124.

Socas-Rodríguez, B., Álvarez-Rivera, G., Valdés, A., Ibáñez, E., & Cifuentes, A. (2021). Food by-products and food wastes: are they safe enough for their valorization?. *Trends In Food Science & Technology*, 114, 133-147.



## In Vitro Antibacterial Activity of Sulphur Nanoparticles as a Possible Application to Control Bacterial Blight Caused by *Xanthomonas* spp. in Anthurium

Sriyani E. Peiris <sup>1\*</sup> Gayani Malwattage <sup>2</sup>, Raveena D. Ratnayake <sup>3</sup>, Kasun L. Seneviratne <sup>4</sup>, Colin N. Peiris <sup>5</sup>

<sup>1, 2, 3, 5</sup> Faculty of Humanities and Sciences, Sri Lanka Institute of Information Technology (SLIIT), New Kandy Road, Malabe, Sri Lanka

<sup>4</sup> Integrated Watershed and Water Resources Management Project, Ministry of Irrigation, Colombo, Sri Lanka

### ARTICLE INFO

#### Article History:

Received Date: 01 July 2022

Accepted Date: 15 September 2022

#### Keywords:

Sulfur nanoparticles; *Xanthomonas* spp; Anthurium; Bacterial blight

#### Citation:

Sriyani E. Peiris, Gayani Malwattage, Raveena D. Ratnayake, Kasun L. Seneviratne, Colin N. Peiris. (2022). *In Vitro Antibacterial Activity of Sulphur Nanoparticles as a Possible Application to Control Bacterial Blight Caused by Xanthomonas* spp. in Anthurium. Proceedings of SLIIT International Conference on Advancements in Sciences and Humanities, (11) October, Colombo, 234 - 240.

### ABSTRACT

Anthurium blight is caused by *Xanthomonas* spp. which is regarded as the most threatening disease to the anthurium industry worldwide. Therefore, the current study was carried out to determine whether the application of sulphur nanoparticles (SNPs) is a possible solution for treating anthurium cultivars infected with *Xanthomonas* spp. The bacterium *Xanthomonas* was isolated using standard methods and a single bacterial colony was isolated using nutrient agar. The colonies were identified as *Xanthomonas* spp as they were gram-negative, motile rods due to the colony characters like yellow color because of the xanthin produced. The symptoms appeared in the pathogenicity test which was carried out by injecting purified *Xanthomonas* sp. into disease free anthurium plants confirmed the identification of the bacterial strain. Time-kill assay was conducted using *Staphylococcus aureus*, *Escherichia coli* and isolated *Xanthomonas* spp to investigate the behavior of SNPs. The results showed that suspension treated with 1g of SNPs for 30 minutes inhibited growth of *Staphylococcus aureus* colonies showing mean number of 7.92 CFU/ml compared to the control (mean number of colonies 9.09 CFU/ml ) treatment following 12 hours incubation. However, *Escherichia coli*, and isolated gram-negative rods (*Xanthomonas*

\* Sriyani, sriyani.p@slit.lk

spp) did not show positive influence for SNPs when compared to the control treatment. Therefore, further investigation is required to reach firm conclusions about this matter because the antimicrobial activity of SNPs varies depending on the type of target microorganisms, method and solvent used to dissolve SNPs.

## INTRODUCTION

Anthurium (*Anthurium andraeanum* Linden ex André), having second largest demand in tropical flowers, is cultivated throughout the tropics as well as in greenhouses in temperate areas. *Xanthomonas axonopodis* pv. *dieffenbachiae* (XAD), formerly known as *Xanthomonas campestris* pv. *dieffenbachiae*, has, however, had a substantial impact on anthurium production around the world. The demise of the Hawaiian anthurium industry in the 1980s was caused by this disease, which was first recorded in Brazil in 1960 and then in Hawaii in 1971 (Elibox and Umaharan, 2008). It has now been reported in most nations producing anthurium.

Sulfur has been successfully utilized as a pesticide to treat a variety of plant diseases (Abuyeva et al., 2018; Rao and Paria, 2013). However, extreme hydrophobicity in sulfur has hampered its real use. Nanotechnology, by the way, has opened a new way of utilizing sulfur. Surface modified nano-sized sulfur nanoparticles (SNPs) have been reported to have excellent antimicrobial and antifungal activities (Abuyeva et al., 2018). Therefore, the present study was conducted to study the behavior of the newly synthesized sulfur nanoparticles against the *E.coli*, *Staphylococcus aureus* and isolated strain of *Xanthomonas* spp.. Hence, we suggest that, through further investigations, sulfur nanoparticle treatment method can be implemented for the anthurium blight treatment in anthurium cultivars.

## MATERIALS AND METHODS

Sulfur Nanoparticle (SNP) Synthesizing Method

A  $\text{Na}_2\text{S}_2\text{O}_3 \cdot 5\text{H}_2\text{O}$  (1M) solution was prepared using 62.04 g of  $\text{Na}_2\text{S}_2\text{O}_3 \cdot 5\text{H}_2\text{O}$  solid crystals dissolved in 250 mL distilled water. The mixture was first magnetically stirred at 500 rpm to dissolve crystals, then

heated the solution at 60 °C. The solution was then mixed with 125.0 mL of 1M HCl solution while being constantly stirring and heating. A white color turbidity was immediately formed with a few drops of 1M HCl and then turned into yellow particles, the reaction was terminated after 40 minutes. The yellow precipitate (SNPs) was collected, washed with distilled water (3-5 times) and dried at 70 °C for 2 hours (Li et al., 2013; Suleiman et al., 2014). The SNPs are finally ground into a fine powder using mortar and pestle.

## Characterization of Sulfur Nanoparticles

X-ray Diffractometer (XRD) analysis was carried out using Rigaku Ultima-IV with Cu K $\alpha$  radiation ( $\lambda=1.5405 \text{ \AA}$ , 30 mA, 40 kV), at the scanning rate of 4° min<sup>-1</sup> within the range of 10-80° to determine the crystallographic characteristics of synthesized SNPs.

Isolation of *Xanthomonas* spp. and Pathogenicity test

Diseased leaves of an anthurium plant showing typical bacterial blight symptoms were collected. Inside the laboratory, wounded leaves were surface sterilized with ethanol, and wounded sections were crushed using sterilized scissors. The inoculum preparation followed by the serial dilution method and pour plates techniques were implemented as described by Collins et al., 2004 with slight modifications. Then, a single bacterial colony was isolated and inoculated into a standard nutrient agar (NA) (HIMEDIA India), which was incubated for 48 hours at 36 °C. All experiments were repeated as a triplicate. Individual colonies were then purified through two to three successive transfers and repeated streaking on respective media plates. Pathogenicity test was performed as described by Prior & Rott (1989) with slight modifications. All isolates were evaluated for pathogenicity by injecting 1ml, 2ml and 3ml samples  $1 \times 10^8$  CFU/mL into stems, juvenile and adult leaves of *Anthurium andraeanum* cv 'Tera' (Prior & Rott, 1989 ;Norman and Ali 2012).

## Morphological Identification of *Xanthomonas* spp. (Microscopic method)

Colony morphologies of all isolates were Gram stained and pigmentation, growth, and colony features were noted through light microscopical observations. The Gram staining

was done as per the previous studies (Moyes et al., 2009). Visual colony morphologies according to the standard descriptions, texture, color, and surface were recorded and compared with literature (Arshiya et al., 2014).

### Time-kill Assay

Antibacterial activity of SNPs was performed against *Xanthomonas* spp., *Staphylococcus aureus* (*S. aureus*), and *Escherichia coli* (*E. coli*) using the Time-kill assay followed by Shankar and Rhim technique (Shankar & Rhim., 2018) with minor modifications. Freshly prepared *E. coli*, *S. aureus* and *Xanthomonas* spp inoculum tubes were compared to the McFarland standard to obtain a turbidity of 0.5 McFarland. This was confirmed by measuring the optical density at 540 nm in UV spectrophotometer. Quantities of 50mg, 75mg and 1g SNPs were separately added to the 100ml of microbial suspensions and agitated on a magnetic stirrer at 400rpm for 30 minutes. Then these suspensions were poured into plates according to the pour plate technique. The plates were incubated at 36 °C for 12 h, and viable colonies were determined using plate count on nutrient agar plate. *E. coli*, *S. aureus* and *Xanthomonas* spp. suspended in the distilled water (without SNPs) were used as the control treatment. All treatments were performed in triplicate.

## RESULTS AND DISCUSSION

### XRD Analysis of synthesized SNPs

The results of X-ray Diffraction (XRD) examination of the synthesized SNPs are shown in Figure 2. All diffraction peak positions (2-theta) were compared with XRD International Centre for Diffraction Data (ICDD) database (PDF number 00-024-0733). According to the Debye–Scherrer formula (Seneviratne et al., 2021) the average crystallite size of the synthesized SNPs is around 5.9 nm. There were no impurity peaks apart from sulfur. It suggests that nanoparticle washing removes impurities like sodium chloride (NaCl) from the nanoparticle surface. We do not use ethanol-water for this. We use the gravity filtration method to wash sulfur particles. Therefore, our synthesis and washing method is low-cost and more effective than expensive chemical treatments.

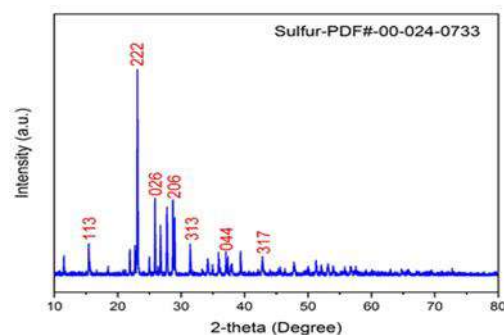


Figure 2: XRD Pattern of Synthesized SNPs

### Morphological Identification of *Xanthomonas* spp. and Pathogenicity test

The colony morphology was identified by visual observations and through the microscopic method. Morphologically around 10-15 colonies were identified in one plate where random colonies were selected, and the purification process was continued. Selected colonies were small to medium in size and form; convex and mucoid (Figure 3A). Due to Xanthin produced by *Xanthomonas* species, raised colonies were yellow. Visual inspection revealed that all XAD isolates had colonies that ranged in color from yellow to light yellow. Under a microscope, the staining reaction was detected, and bacteria were discovered to be gram-negative, motile rods. On NA medium, colonies were round, elevated, and creamy yellowish in color (Figure 3A). These findings were backed up by Breed et al., 1989).

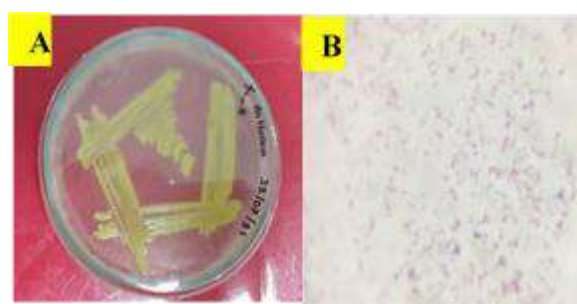


Figure 3: (A) Purified *Xanthomonas axonopodis* pv. *dieffenbachiae* on Nutrient agar plates; (B) Gram's staining of purified *Xanthomonas axonopodis* pv. *Dieffenbachiae*

Moreover, bacterial colonies discovered were motile rods, tiny, medium, and large and pink in color under microscopic examination (figure 3B). The findings were consistent with previous research (Arshiya et al., 2014). The yellow raised colonies are caused by xanthin, which is produced by members of the genus *Xanthomonas*. The colony color of all Xac

isolates ranged from yellow to light yellow, as observed visually (Arshiya et al., 2014). Morphological data, such as size and shape of colonies was small to medium, convex and mucoid recorded (Table 1). Only gram's negative colonies were selected for further analysis.

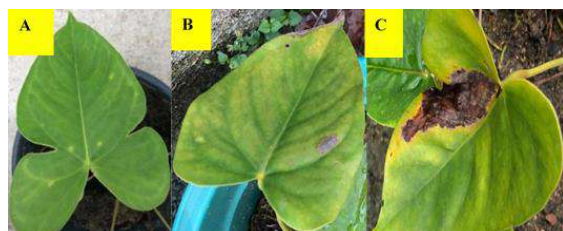


Figure 5: Pathogenicity test; (A), (B) and (C) depict the progression of the disease

## RESULTS AND DISCUSSION

Early leaf symptoms of anthurium bacterial leaf spot were observed to be small, angular, oily spots on the abaxial surface around veins, leaf edges, and spathes (Figure 5A). These lesions grew quickly, producing huge, black necrotic patches that age to grey-black and deform leaves (Figure 5B). Necrotic patches had oily borders and narrow, brilliant chlorotic halos around them. Systemic infections caused a broad yellowing of the entire lamina as well as the usual black, necrotic lesions that develop from the leaf petioles into major veins (Figure 5C). These observations were as same as which were reported by Prior & Rott, 1989 (Prior, P., & Rott, P., 1989).

Table 1: Morphological characterization of XAD colonies

Isolates	Shape	Size	Grams (+/-)	Surface	Margin	Color	Elevation
XA1-a	Rod	small	+	Mucoidal	Even	yellow Light	Convex
XA2-b	Rod	Medium	+	Mucoidal	Even	yellow Light	Convex
XA3-c	Rod	Medium	-	Mucoidal	Even	yellow Light	Convex
XA4-d	Rod	Medium	-	Mucoidal	Even	yellow	Convex
XA5-d	Rod	Medium	+	Mucoidal	Even	yellow	Convex
XA6-d	Rod	small	-	Mucoidal	Even	yellow Light	Convex
XA7-d	Rod	small	+	Mucoidal	Even	yellow Light	Convex
XA8-d	Rod	small	-	Mucoidal	Even	yellow	Convex

### Experiment on Antibacterial activity of SNPs

The antibacterial activity of SNPs, as determined by the total colony count technique is depicted by the Figure 6. Results indicated that the SNPs treatments can significantly ( $p \leq 0.05$ ) decrease the *S. aureus* colonies in three different treatments compared to the control treatment (Table 2). The lowest numbers of colonies mean value 7.92 CFU/ml was given in the *S. aureus* treated with SNPs 1g. *S. aureus* treated with 75 mg and 50 mg showed 8.02 CFU/ml and 8.19 CFU/ml colonies mean values respectively compared to the control treatment. Only *S. aureus* suspension diluted in distilled water (control) treatment showed 9.09 CFU/ml mean value (Table 2). There was no significant difference between the treatments and reduction of *E. coli* and *Xanthomonas* spp. colonies compared to the control treatments (Table 2).



Table 2. Effects of SNPs treatments on colonies formation of selected microbial species

Colonies from each strains (CFU/ml)	Treatments			
	SNPs- 1g	SNPs -75 mg	SNPs -50 mg	Control
<i>S. aureus</i>	7.92 ± 0.038 <sup>a</sup>	8.02 ± 0.030 <sup>b</sup>	8.19 ± 0.009 <sup>c</sup>	9.09± 0.051 <sup>d</sup>
<i>E. coli</i>	9.06 +0.002 <sup>a</sup>	9.05± 0.0005 <sup>a</sup>	9.05 ± 0.002 <sup>a</sup>	9.06 ± 0.013 <sup>a</sup>
<i>Xanthomonas</i> <i>spp</i>	7.81+0.089 <sup>a</sup>	7.79 ± 0.112 <sup>a</sup>	7.78 ± 0.087 <sup>a</sup>	7.77 ± 0.047 <sup>a</sup>

\* Means followed by the same letter within a column are not significantly different at Tukey HSD (p<0 .05) (n=12).

However, results revealed that the SNPs have the strongest antimicrobial efficacy against *S. aureus*. Hence, it was evident that the synthesized nanoparticle dispersion was effective only against gram-positive bacteria.

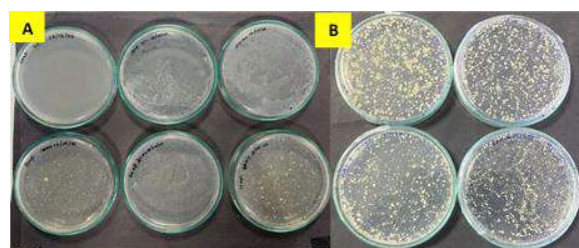


Figure 6: Antibacterial activities of SNPs against *S. aureus* (A) and *Xanthomonas* spp (B)

Moreover, the purified gram-negative isolate results did not show positive influence for SNPs partials (Figure 6B; Table 2). Further investigation is required to reach firm conclusions about this matter because the antimicrobial activity of SNPs varies depending on the type of target microorganisms and solvent used to dissolve SNPs, in addition to the properties of the SNPs, such as size, shape, source of sulfur, and preparation method (Saedi et al., 2020).

SNPs can be identified as promising surface sterilizing agent because of their strong antibacterial capabilities. There have been several reports of SNPs antibacterial action; however, the results have been inconsistent. Paralikar and Rai reported that SNPs reduced the development of *E. coli* (gram-negative) and *S. aureus* (gram-positive) at a concentration of

200 g/mL (Paralikar & Rai.,2017). On the other hand, Suleiman and authors reported that the MIC value of SNPs against *S. aureus* was 5.47 g/mL. However, no antibacterial action was detected against gram-negative bacteria (*E. coli* and *P. aeruginosa*) at concentrations ranging from 0.68 to 800 g/mL (Suleiman et al., 2015). Further, according to the present investigation results showed that 50mg of SNPs decreases the growth of *S. aureus* after 12h incubation (figure 6). As a result, the differences in results provided by various studies may be attributable to differences in SNPs synthesis methods, sulfur sources for SNPs synthesis, types of stabilizing agents, and microorganism species.

Although the precise mechanism underlying SNPs antibacterial activity has not yet been identified, several likely antimicrobial mechanisms have been put forth, including interactions with biological molecules on the surface of bacteria that cause membrane rupture and lysis of the cell membrane, the production of toxic H<sub>2</sub>S gas through reactions with thiol groups in proteins and lipids, and interactions with DNA that cause denaturation of DNA and cell death (Rai et al., 2016).

## CONCLUSION

Our results showed that the synthesized nanoparticle dispersion is effective against selected reference gram-positive bacteria *S.aureus*. The results indicate that the lowest numbers of colonies mean value 7.92 CFU/ml was given in the *S.aureus* treated with SNPs 1g compare to the control (mean value 9.09

CFU/ml). The Morphological and pathogenicity test results confirm that the isolates were gram-negative and more chance to becoming one of *Xanthomonas* spp strain. However, further investigations are needed to confirm the activity of SNPs to treat bacterial blight infection as the results did not show positive results for the isolated gram-negative *Xanthomonas* spp. and the reference gram-negative *E.coli*.

## ACKNOWLEDGEMENT

This research was financially supported by the Accelerating Higher Education Expansion and Development Operation (AHEAD) operation of the Ministry of Higher Education Sri Lanka funded by the World Bank with grant number RIC No-01.

## REFERENCES

- Abuyeva, B. et al., 2018. Preparation of ointment materials based on sulfur nanoparticles in water-soluble polymers. *Materials Today: Proceedings*, 5(11), pp.22894–22899.
- Alvarez, A. M., J. Venette, and D. Norman. 1994. Relationship of aerosols to anthurium blight, p. 20–26. In K. M. Delate and C. H. M. Tome (ed.), *Proceedings of the Fifth Hawaii Anthurium Industry Conference*. HITAH Journal Series 02.02.94. University of Hawaii, Honolulu.
- Arshiya, M., Suryawanshi, A., More, D., Baig, M.M.V., 2014. Repetitive PCR based detection of genetic diversity in *Xanthomonas axonopodis* pv. *citri* Strains. *J. Appl. Biology. Biotech.*, 2(1): 017-022.
- Breed, R.S., Murry E.G.D., Smith, N.R., 1989. *Bergey's Manual of Systemic Bacteriology*. Eds. S.T. Williams
- Collins, C. H., Lyne, P. M., & Grange, J. M. (2004). *Microbiological methods*. 5th. Arnold, a member of the hodder headline Group. London.
- Elibox, W., Umaharan, P., 2008. A quantitative screening method for the detection of foliar resistance to *Xanthomonas axonopodis* pv. *dieffenbachiae* in anthurium. *European Journal of Plant Pathology* 121, 35–42.
- Fukui, R., H. Fukui, R. McElhaney, S. C. Nelson, and A. M. Alvarez. 1996. Relationship between symptom development and actual sites of infection in leaves of anthurium inoculated with a bioluminescent strain of *Xanthomonas campestris* pv. *dieffenbachiae*. *Appl. Environ. Microbiol.* 62:1021–1028. doi: 10.1128/aem.62.3.1021-1028.1996
- Moyes, R., Reynolds, J., & Breakwell, D. (2009). Differential Staining of Bacteria: Gram Stain. *Current Protocols In Microbiology*, 15(1).
- Norman, D.J. and Ali, S.G. (2012) *Anthurium Diseases: Identification and Control in Commercial Greenhouse Operations*. UF/IFAS Extension. 292 – 298.
- Paralikar, P., & Rai, M. (2018). Bio-inspired synthesis of sulphur nanoparticles using leaf extract of four medicinal plants with special reference to their antibacterial activity. *IET Nanobiotechnology*, 12(1), 25–31.
- Prior, P., & Rott, P. (1989). Bacterial Leaf Spot of Anthurium (*Anthurium* spp.) Caused by a *Pseudomonas* sp. in the French West Indies. *Journal Of Phytopathology*, 124(3), 215–224.
- Rai, M., Ingle, A., & Paralikar, P. (2016). Sulfur and sulfur nanoparticles as potential antimicrobials: from traditional medicine to nanomedicine. *Expert Review Of Anti-Infective Therapy*, 14(10), 969–978.
- Rao, K.J. & Paria, S., 2013. Use of sulfur nanoparticles as a green pesticide on *fusarium solani* and *Venturia inaequalis* phytopathogens. *RSC Advances*, 3(26), p.10471.
- Saedi, S., Shokri, M., & Rhim, J. (2020). Antimicrobial activity of sulfur nanoparticles: Effect of preparation methods. *Arabian Journal Of Chemistry*, 13(8), 6580–6588.

- Seneviratne, K.L., Munaweera, I., Peiris, S.E., Peiris, C.N., Kottegoda, N., 2021. Recent Progress in Visible-Light Active (VLA) TiO<sub>2</sub> Nano-Structures for Enhanced Photocatalytic Activity (PCA) and Antibacterial Properties: A Review. *Iran. J. Catal.* 11, 217–245.
- Shankar, S., & Rhim, J. W. (2018). Preparation of sulfur nanoparticle-incorporated antimicrobial chitosan films. *Food Hydrocolloids*, 82, 116-123.
- Suleiman, M., Al-Masri, M., Al Ali, A., Aref, D., Hussein, A., Saadeddin, I., & Warad, I. (2015). Synthesis of nano-sized sulfur nanoparticles and their antibacterial activities. *J Mater Environ Sci*, 6(2), 513-518.



## Effects of Coconut Water on Micropropagation of Caladium Bicolour Cv 'Thai Beauty'

Raveena D. Ratnayake<sup>1</sup>, Sriyani E. Peiris<sup>\*1</sup>, Gayani Malwattage<sup>2</sup>, Colin N. Peiris<sup>3</sup>

<sup>1,2,3</sup>Faculty of Humanities and Sciences, Sri Lanka Institute of Information Technology (SLIIT), New Kandy Road, Malabe, Sri Lanka

### ARTICLE INFO

#### Article History:

Received Date: 01 July 2022

Accepted Date: 15 September 2022

#### Keywords:

Caladium; Micropropagation; Coconut water; 6-benzylaminopurine

#### Citation:

Raveena D. Ratnayake 1, Sriyani E. Peiris \* 1, Gayani Malwattage 2, Colin N. Peiris. (2022). *Effects of Coconut Water on Micropropagation of Caladium Bicolour Cv 'Thai Beauty'*. Proceedings of SLIIT International Conference on Advancements in Sciences and Humanities, (11) October, Colombo, 241 - 245.

### ABSTRACT

Caladium bicolor (Aiton) Vent. is an attractive commercial ornamental plant in the horticulture industry which is popular as potted plants for homescaping and as garden plants for landscaping. Propagation of this attractive plant through micropropagation has more benefits than conventional propagation. The current study describes an in vitro multiplication of Caladium bicolor cv 'Thai Beauty' with coconut water as a supplement. Shoots derived from leaf explants were cultured on Murashige and Skoog (MS) medium supplemented with 0, 0.5, 1 and 1.5 mg/L (6-Benzylaminopurine) with and without 120 mL/L of coconut water. The results showed that coconut water (CW) with 0.5 and 1.5 mg/L BAP in the medium increased caladium shoot multiplication having an average of 6.67 and 7.75 shoots /shoot, respectively, with a large number of high-quality shoots. Coconut water alone in the medium also produced average of 3.42 shoots/ shoot. Hence, the current protocol provides a direct, cost-effective mass propagation method for large-scale commercial cultivation of caladium.

\* Sriyani, sriyani.p@slit.lk

## INTRODUCTION

Caladium is an ornamental aroid that belongs to the family Araceae and is prized for its vibrant and diversely shaped leaves and leaf colour. Because of this, they are frequently grown in the floriculture industry as potted plants or hanging baskets as well as accent or border plants in the landscape. The ornamental value of caladiums is mostly determined by the characteristics of their leaves (Deng, 2012). Commercial cultivars exhibit an enormous variety of leaf shapes, colors, and coloration patterns that are uncommon in other cultivated plants. As a result, caladium has a variety of fascinating leaf and colour patterns (Deng, 2012).

For commercial purposes, caladium is typically propagated using tubers, but tuber propagation has some drawbacks such as the spread of diseases and change of quality in foliage with seasons (Ali et al., 2007). Commercial propagation can also be carried out using seeds. However, it is challenging to use seeds as planting materials due to the small size and high mortality of the seeds as well as the high cost, difficulty in maintaining pathogen-free plants, and significant risk of variability (Deng, 2012., Ali et al., 2007). Hence, techniques for in vitro propagation enable the creation of clonal plants with consistent physiological characteristics and possibly quick multiplication. For the quick production of various plant species and cultivars, especially decorative plants, micropropagation has been widely used (Seydi et al., 2016). Therefore, in vitro growth methods for caladium have been investigated and developed for possible mass propagation (Ali et al., 2007). In many micropropagation studies, several plant growth regulators (PGRs), and dosages have been examined to find the best way to obtain a proper propagation protocol (Seydi et al., 2016).

Liquid endosperm of coconut (*Cocos nucifera* L.) is a rich natural source of hormones that controls plant growth, like auxins and cytokinins (Young et al., 2009). Hence, it was reported that coconut water (CW), has been employed in olive as a source of zeatin in the in vitro culture (Souza et al., 2013). Zeatin is a costly chemical, thus substituting coconut water for it makes in vitro propagation financially feasible (Souza et al., 2013). Spinach (*Spinacia oleracea* L.) callus growth, shoot regeneration and shoot growth

have been demonstrated to be improved by a cell culture medium containing coconut water previously (Al-Khayri et al., 2019). However, there is no study yet documented to observe the role of coconut water in in vitro shoot proliferation of caladium. Therefore, the purpose of this study was to determine how coconut water-supplemented media affected *C. bicolour* cv 'Thai Beauty' micropropagation.

## MATERIALS AND METHODS

### Plant material and Surface sterilization

A healthy, 90% unfolded leaf of *Caladium bicolour* cv 'Thai Beauty' was pre-washed by gently rubbing in a solution of liquid soap (Dettol™ hand wash) and water. Then, using an orbital shaker set to 180 rpm, the leaf was washed for 10 minutes in 100 mL of a 10% Clorox™ solution with two drops of liquid soap. After discarding the washing solution, the explants were washed for 10 minutes with fresh 10% Clorox. The leaves were then rinsed with autoclaved deionized water inside the laminar floor to remove the 10% Clorox. The margins of the disinfected caladium leaves were trimmed and cut into pieces of 8 X 8 mm size. The leaf explants were then placed on semi-solid ½ MS (macro salts in half) medium containing 1 mg/L 6 -benzyl amino purine (BAP), 0.1 mg/L 2,4-dichlorophenoxyacetic acid (2,4-D) and 3% sugar with pH adjusted to 5.8. The cultures were then placed under total darkness at room temperature until shoot regeneration.

### Shoot Multiplication

Coconut water was extracted from mature coconuts and filtered using a 110 mm sterile filter paper. Then the filtrate was sterilized using a microfilter. Shoots produced from callus were first cultured on hormone-free semi-solid MS medium with 3% sugar for shoots to grow further (Figure 1). Then the 2-3 cm shoots were cultured on MS medium with three concentrations of (BAP) with a range of 0.5, 1 and 1.5 mg/L and with a control of 0 mg/L BAP. The medium was supplemented with 120 mL/L of coconut water. Another group of cultures with the same concentrations of BAP without coconut water was used to compare the performance of coconut water with BAP on shoot multiplication of caladium. All the media used were sterilized with the CSUP (Crop

Science, University of Peradeniya) media sterilization methods (Peiris et.al, 2012). Data were recorded in terms of shoot number and shoot length after one month.



Figure 1: Shoot regeneration from leaf explants: A. Callus, B. Emerging shoots, C. Shoots grown on hormone-free medium

### Statistical analysis

The data on the effects of growth regulators on morphogenesis were analyzed by one-way analyses of variance (ANOVAs). Values are means of five replicates from two experiments, and the presented mean values were separated using Tukey HSD Test.

## RESULTS AND DISCUSSION

Results indicated that the combination of BAP and CW significantly ( $p \leq 0.05$ ) induced shoot multiplication. The highest number of shoot multiplication (7.75 shoots/shoot) was produced in the combination of 1.5 mg/L BAP with CW. The same BAP level without CW gave only an average of 4 shoots/shoot. The BAP level of 0.5 mg/L with CW also produced an average of 6.67 shoots/shoot, which is relatively close to the highest number produced from 1.5 mg/L BAP with CW. However, 0.5 mg/L BAP without CW produced only an average of 3.35 shoots/shoot. Coconut water alone also produced more than 3 shoots. There was no significant difference between the shoot length in all the combinations. Therefore, the results indicated that the combination of BAP and coconut water had a synergetic effect on the shoot multiplication of caladium (Figure 2).

Table 1. Effect of different BAP and CW combinations on shoot multiplication caladium

Treatments	BAP + CW	Average Number of shoots	Average Shoot length
	(mg/L, mL)	per explant (mean $\pm$ SD)	(cm) (mean $\pm$ SD)
T1	0.0+0.0	2.00 $\pm$ 1.782 <sup>a</sup>	2.84 $\pm$ 0.78 <sup>a</sup>
T2	0.5 +0.0	3.50 $\pm$ 1.732 <sup>a</sup>	2.76 $\pm$ 0.60 <sup>a</sup>
T3	1.0+0.0	3.33 $\pm$ 1.231 <sup>a</sup>	2.68 $\pm$ 0.64 <sup>a</sup>
T4	1.5+0.0	4.00 $\pm$ 1.651 <sup>ab</sup>	2.23 $\pm$ 1.09 <sup>a</sup>
T5	0.0+120	3.42 $\pm$ 0.953 <sup>a</sup>	2.04 $\pm$ 0.79 <sup>a</sup>
T6	0.5+120	6.67 $\pm$ 2.640 <sup>bc</sup>	2.92 $\pm$ 0.74 <sup>a</sup>
T7	1.0+120	4.25 $\pm$ 3.545 <sup>ab</sup>	2.72 $\pm$ 0.89 <sup>a</sup>
T8	1.5+120	7.75 $\pm$ 3.571 <sup>c</sup>	2.12 $\pm$ 1.15 <sup>a</sup>

\* Means followed by the same letter within a column are not significantly different at Tukey HSD ( $p < 0.05$ ) (n=12).



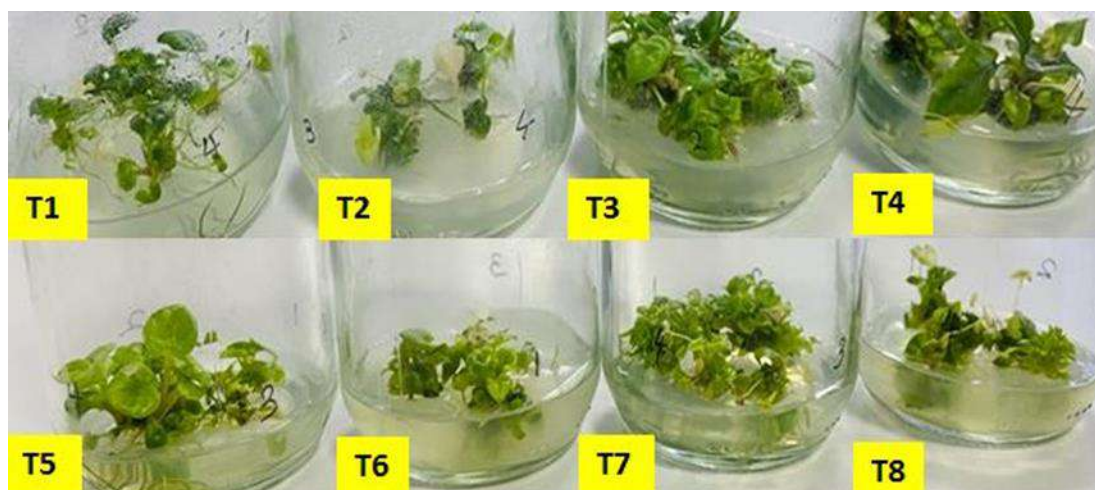


Figure 2: Multiplication stage of *Caladium* with different combinations of BAP concentrations and Coconut Water; Shoot proliferation on MS media supplemented with (T1) 0 mg/L BAP, (T2) 0.5 mg/L BAP, (T3), 1 mg/L BAP, and (T4) 1.5 mg/L BAP, (T5) 0 mg/L BAP + CW, (T6) 0.5 mg/L BAP + CW, (T7) 1 mg/L BAP + CW, and (T8) 1.5 mg/L BAP + CW

Therefore, the observations of the combined effect of BAP and coconut water were aligned with previous similar studies. The best outcomes in terms of olive (*Olea europaea* L.) culture establishment stemmed from using 50 mL/L of coconut water and 1 mg/L BAP as medium supplements. The highest proliferation rates for the in vitro multiplication stage were attained by keeping the concentration of coconut water at 50 mL/L and raising BAP to 2 mg/L, which resulted in an average of 3.4 new explants every 30 days (Peixe et al., 2007).

It was observed that when increasing the BAP concentration without CW (1.5 mg/L BAP) the number of quality shoots produced decreased even though the number of shoots was higher. Thus, it was visible that when increasing the BAP hormone concentration up to 1.5 mg/L BAP along with coconut water, the best cluster formation was given with a higher number of quality shoots. These results were parallel with previous literature (Peixe et al., 2007). It was observed that the average number of shoots per culture of Rose (*Rosa indica* L.) increased as BAP concentration was raised from 0.5 mg/L to 1.0 mg/L. In 10-15 days, the greatest number of shoots (20) per culture was generated at this dosage. However, not only did the rate of shoot formation drop as BAP concentration increased, but it also took longer for shoots to form (Shabbir et al., 2009). Besides, in another experiment, BAP significantly affected the average shoot number, length, and weight but did not affect the total length and total weight per explant in Pineapple (*Ananas comosus* L.

Merr.) cv. Smooth Cayenne (Hamad & Taha, 2008).

#### Conclusion

In conclusion, the current approach provides an efficient protocol for the successful shoot proliferation of *Caladium* using coconut water, which could be used in large-scale commercial cultivation. The results revealed that coconut water with both 0.5 and 1.5 mg/L BAP and coconut water alone promoted *caladium* in vitro shoot multiplication with a significant number of excellent quality shoots. As a result, it can be concluded that adding coconut water to the multiplication medium is significantly more beneficial than BAP alone in the medium. Hence the proposed approach offers a straightforward, cost-effective mass propagation strategy for large-scale commercial *Caladium* propagation.

#### ACKNOWLEDGMENT

The authors acknowledge the Accelerating Higher Education Expansion and Development Operation (AHEAD) of the Ministry of Higher Education Sri Lanka sponsored by the World Bank under grant number RIC No-01 supported to carry out this research.

#### REFERENCES

- Ali, A., Naz, S., & Munawar, A. (2007). An in vitro study on Micropropagation of *Caladium bicolor*. *International Journal of Agriculture and Biology*, 9(5), 731-735.

- Al-Khayri, J. M., Huang, F. H., Morelock, T. E., & Busharar, T. A. (1992). Spinach tissue culture improved with coconut water. *Hort Science*, 27(4), 357-358.
- Deng, Z. (2012). *Caladium Genetics and Breeding: Recent Advances. Forticulture And Ornamental Biotechnology*, (1), 53-61.
- Hamad, A., & Taha, R. (2008). Effect of Benzylaminopurine (BAP) on in vitro Proliferation and Growth of Pineapple (*Ananas comosus* L. Merr.) cv. Smooth Cayenne. *Journal Of Applied Sciences*, 8(22), 4180-4185.
- Peiris, S. E., De Silva, E. D. U. D., Edussuriya, M., Attanayake, A. M. U. R. K., & Peiris, B. C. N. (2012). CSUP technique: a low cost sterilization method using sodium hypochlorite to replace the use of expensive equipment in micropropagation. *Journal of the National Science Foundation of Sri Lanka*, 40(1), 49.
- Peixie, A., Raposo, A., Lourenço, R., Cardoso, H., & Macedo, E. (2007). Coconut water and BAP successfully replaced zeatin in olive (*Olea europaea* L.) micropropagation. *Scientia Horticulturae*, 113(1), 1-7.
- Seydi, S., Negahdar, N., Andevvari, R., Ansari, M., & Kaviani, B. (2016). Effect of BAP and NAA on Micropropagation of *Caladium bicolor* (Aiton) Vent., an Ornamental Plant. *Journal Of Ornamental Plants*, 6(1), 59-66.
- Shabbir, A., Hameed, N. A., Ali, A., & Bajwa, R. (2009). Effect of different cultural conditions on micropropagation of rose (*Rosa indica* L.). *Pak. J. Bot*, 41(6), 2877-2882.
- Souza, R. A. V. D., Braga, F. T., Setotaw, T. A., Vieira Neto, J., Azevedo, P. H. D., Azevedo, V. H. D., & Cançado, G. M. D. A. (2013). Effect of coconut water on growth of olive embryos cultured in vitro. *Ciência Rural*, 43, 290-296.
- Young, J. W., Ge, L., Ng, Y. F., & Tan, S. N. (2009). The chemical composition and biological properties of coconut (*Cocos nucifera* L.) water. *Molecules*, 14(12), 5144-5164.





## Commercialization of *Dracaena Sanderiana* (Lucky Bamboo) as a Foliage Crop in Hambanthota District of Sri Lanka

H.I.G.K.Anuruddi<sup>1</sup> and D.L.C.K. Fonseka<sup>1\*</sup>

<sup>1</sup> Department of Crop Science, Faculty of Agriculture, University of Ruhuna

\* Fonseka, kumarifonseka23@gmail.com

### ARTICLE INFO

#### Article History:

Received Date: 01 July 2022

Accepted Date: 15 September 2022

#### Keywords:

Challenges; *Dracaena sanderiana*; Dry zone; Hambantota; Potentials

#### Citation:

H.I.G.K.Anuruddi and D.L.C.K. Fonseka. (2022). *Commercialization of Dracaena Sanderiana (Lucky Bamboo) as a Foliage Crop in Hambanthota District of Sri Lanka*. Proceedings of SLIIT International Conference on Advancements in Sciences and Humanities, (11) October, Colombo, 246 - 250.

### ABSTRACT

*Dracaena sanderiana* is an in-demand cut foliage plant belongs to family Agavaceae. *Dracaena* varieties are commercially produced in export-oriented large scale plantations in Sri Lanka. The crop is mainly cultivated in the wet zone due to the favourable growth conditions which enhance the export quality characteristics of the plant. The climatic conditions in the dry zone is also favourable for its growth under appropriate conditions. But the supply of the crop still falls short of the demand. A survey was conducted to identify possibilities of introducing *Dracaena* as a future commercial foliage to the Hambantota district. Randomly selected 40 flower growers from selected divisional secretariat divisions (DSD) in Hambantota were interviewed administering a pre-tested questionnaire during early 2022. Data were subjected to a percentage analysis while descriptive statistical methods were used to represent the results using Microsoft Excel. According to the survey, bulk of them (60%) continue floriculture business as a full time employment. Middle aged women work in floriculture enterprises in large numbers. The majority of responders (70%), are willing to incorporate *Dracaena* as a fresh floriculture produce for their nurseries. Fifty percent of them have additional land with natural shade up to 0.25 acres, which is possible to utilize for *Dracaena* cultivation with proper intervention. Sixty percent of them stated that they prefer to

train on value addition of *Dracaena* plants by knitting. Fifteen percent (15%) of them possess shade net houses and other infrastructure in place. An export-oriented *Dracaena* producer society in Beliatta DSDs is ready to impart its knowledge and offer advice to novice producers. The need of marketing the products collectively to reduce transportation costs is understood by the respondents. The initial investments on growth structures and irrigation pose a significant challenge. A majority of growers (70%) anticipate receiving financial assistance from the government. A lack of awareness of the crop, low availability of planting materials, high transportation costs along with high prices of fertilizer and fungicides in the markets were other challenges. It is necessary to provide finance support, trading facilities, production aid, and awareness and training initiatives to introduce *D. sanderiana* as a lucrative crop for the Hambantota district.

## INTRODUCTION

Floriculture is a flourishing industry in Sri Lanka with a great potential in both domestic and export markets. But the supplies of many floricultural products from the country have not met the demand. Therefore, it is required to expand the cultivation of floricultural crops around the country to fulfil this demand. *Dracaena sanderiana* is a foliage ornamental plant with a high demand in export market. Currently *Dracaena sanderiana* commercial cultivation is limited to some parts of wet zone in Sri Lanka and not a popular cultivation in dry and intermediate zones. Since there are no export oriented ornamental foliage plant growers in the southern dry zone and intermediate zones, evaluating the possibilities for new crops to cultivate in these areas will aid in sustainable utilization of the lands available in this region while providing more employment opportunities for youth in down south. Southern province of Sri Lanka is identified as a sensitive geographical location with a high population density and a high unemployment rate. According to population housing report, 2012 population of Southern province is 12.1% out of the total population in Sri Lanka. Also, unemployment rate among females is more than twice as males in Southern region. Unemployment rate for Southern province was 3.9% for males and 9.1% for

females in 2018 (Labour force survey, 2018). Unemployment is acutely felt by Hambantota district where 9.6% of labour force is unemployed in 2008. Also, comparatively to many other provinces, a higher level of poverty prevailed in Southern province. Another important characteristic in Southern region is the presence of a large number of economically inactive population. In this context, alternative strategies for regularizing employment opportunities are required in enhancing the income of the farmers. Meanwhile Sri Lankan economy is currently facing a tough time as the COVID19 outbreak and economic crisis, badly affected on majority of the ornamental businesses and heavily impacted on livelihood of farmers. Therefore, increasing the employability of youth is required to overcome this economic downfall. Supportive actions as improving floriculture related commercial ventures would act as a livelihood activity for many women-headed households in the region. Therefore identification of potentials and possible challenges for *Dracaena sanderiana* cultivation in dry and intermediate zone will aid in successful introduction of the crop to the down south. Therefore this survey was designed to identify the challenges and potentials of introducing *D. sanderiana* to some selected areas of Hambantota district.

## MATERIALS AND METHODS

This study was carried out as a field survey in Hambantota district: Sooriyawewa (Veniwel Ara, Mahapelessa, Hathporuwa Grama Niladhari Divisions (GNDs)), Ambalantota (Ridiyagama, Lunama, Nonagama GNDs), Thissamaharama (Kirinda, Kawanthissapura, Joolpallama GNDs), Hambantota (Pallemalla and Siribopura GNDs), Tangalle (Ranna, Rekawa and Netolpitiya GNDs) and Beliatta (Galagama GND) DSDs which belong to Southern province, Sri Lanka by visiting the medium and small scale flower growers. A pre tested semi structured questionnaire was used for the interviews. The data collection was done in January 2022. The data were collected from 40 flower growers of these DSDs and samples were selected randomly from a list of registered flower growers. Socio personal data gathered as age, occupation and education level of the respondents. Socio economic data such as their monthly income, currently cultivated varieties and their nursery size, expandable land area for

a new floriculture business, infrastructure facilities for the business, main selling products, source of the materials sold, transportation methods, future investments and interactions with financial institutions were gathered. Some of the communication variables such as any membership in flower grower societies, support given by the government institutes were gathered. Psychological variables such as respondent's willingness to cultivate *Dracaena sanderiana* as a new foliage crop, their willingness to continue floriculture as a business were evaluated.

## RESULTS AND DISCUSSION

### Socio-personal Information of the Respondents

According to Table 1, a majority (70%) of the respondents were females. The growers ranged in age from 35 to above 65 years old with a higher distribution of age between 40-50 years

(60%). A majority (60%) of the respondents were engaged in the business as a full-time employment while there were graduates and diploma holders among the respondents who engage in government jobs. Most of the growers utilize family labour for the business. According to a study conducted in Colombo district in Sri Lanka to investigate the drivers and barriers faced by women entrepreneurs, their families have encouraged almost all the entrepreneurs when they start their businesses (Dayarathna et al., 2018). Most of the female respondents (60% out of 70% of the female respondents as given in table 01) are willing to participate for training programs on value addition of *D. sanderiana* by knitting. They are ready to be introduced to new market channels which they can sell their value added plants. Therefore, there is a potential for the majority of unemployed female force to be armed with a new innovative venture through this introduction.

Table 1: Background information of the respondents

Variable	Categories	Frequency	Valid %
<b>Sex</b>	Male	12	30
	Female	28	70
<b>Age (Years)</b>	Young (Up to 30)	0	0
	Middle (30 to 60)	24	60
	Old (above 60)	16	40
<b>Occupation</b>	Self employed	24	60
	Farming	13	32.5
	Government job	3	7.5

### Socio-economic Information of the Respondents

Monthly incomes of the respondents from floriculture operations vary from Rs 10 000 to 40 000. The average monthly income was noted as Rs 20, 000. Most of the (60%) of the flower vendors engage in the business for around 2 to 4 years. A majority of them sell plants grown in their own nurseries (70%) while 10% sell plants purchased from other growers in different parts of the country and 20% have their own nurseries and buy products from other growers. The average nursery size was reported as 0.5 acres. Most importantly 50% of them have available space/ lands (more than 0.25 acres) to expand their business if necessary support is given. Also, a majority of them (30%) are willing to utilize those extra land for *Dracaena*

cultivation as a new floriculture venture. It is identified as a positive factor for introduction of *D. sanderiana* to these localities. Only 15% of them possess net houses allocated for the business and others use natural shades like trees and have placed their plants under patios. Most of them mentioned that the existing shade net houses are not utilized in the full potential. None of the respondents grow *D. sanderiana* as a commercial crop in the area. The most challenging task for the 70% of the respondents was transportation of the products to the end users. Most of them either use hired vehicles or public transportation. They suggests that even if they cultivate *D. sanderiana*, transportation to the buying outlets/ exporters will increase their cost of production.

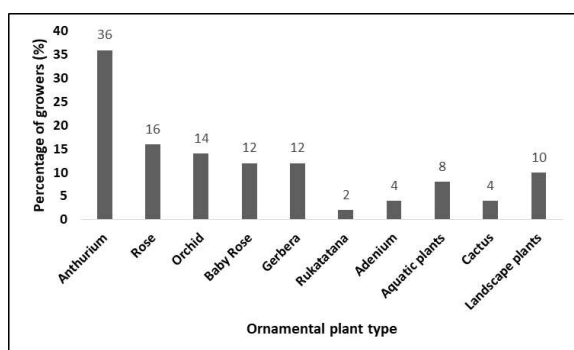


Figure 01: Different types of ornamental plants cultivated by the respondents

#### Communication variables of the respondents

In Beliatta DS division (Intermediate zone) 8 farmers gathered and have formed a grower society to cultivate *D. sanderiana*. They have already cultivated three *Dracaena* varieties; Victory, White and Gold providing temporary shades (not properly established shade net houses) and minimum inputs. They produce export quality cuttings and provide to an export oriented company in Colombo. The biggest challenge they face is transportation cost. Therefore, cost effective transportation methods should be introduced to the rural farmers. As a suggestion, gathering farmers into flower grower societies and marketing the product as a group will reduce the transportation cost up to some extent and thus the profit will be increased. Respondents in other DS divisions are not in flower grower societies and 20% of the respondents in Beliatta were also not in any society. They also wish to join the already established *Dracaena* society once they cultivate *Dracaena*. Most of the growers (70%) expect financial support / loans from the government or from a possible institute to cultivate *Dracaena* as a future crop.

#### Psychological variables of the respondents

A majority of the respondents (70%) are willing to expand their business further. They wish to allocate their excess cultivable lands on *Dracaena* as a new venture. The growers requested advices and support for pre trials of *Dracaena* in their lands. The members in *D. sanderiana* grower society in Beliatta are willing to share their experiences and aid in market channel development of new growers from other areas of the district.

### Potentials and challenges of introduction of *Dracaena sanderiana* as a future crop

#### Potentials

Dry zone in Sri Lanka is comprised with more than 2/3 of land area having many potentials for future agricultural development (Srikrishnah et al., 2012). The climate in these areas is ideal for growing tropical foliage under suitable conditions. Introducing new floriculture crops is an important intervention where farmers can earn utilizing available natural resources including land. *Dracaena sanderiana* has a better price in the market almost year around. Introducing floricultural crops in Hambanthota district as a commercial venture will up bring several benefits to the community. It will be a good livelihood activity for many women-headed households. According to this survey, 60% of the respondents are self-employed while 32.5% are engaged in farming activities. The women respondents are willing to grow *Dracaena* as a new venture. Also they are willing to learn how to value add *Dracaena* plants by knitting. 50% of the respondents have available extra land space which are up to 0.25 acres that can be expanded into a new floriculture crop. Also a majority of them (30%) are willing to utilize those extra land for *Dracaena* cultivation as a new floriculture venture. Already established *Dracaena* Grower society in Beliatta area is a good example for other people who are willing to enter this new market. Willingness of the members in already established grower society to share their experiences and expand their cultivation with other members is also a great potential. Willingness of the respondents to market their product as a group will reduce the transportation cost.

#### Challenges

One major challenge is the initial investments on growth structures, net houses and irrigation. Most of the growers (70%) are expecting financial support / loans from the government or from a possible institute. According to Dayarathna et al., 2018 Credit accessibility positively relates for people's willingness to adopt for the challenges. When they are provided with loans at low interest rates, they

can easily develop their business by investing on infrastructure or on any aspect of the business. Financial literacy of women entrepreneurs in floriculture industry in Battaramulla and Panadura areas in Sri Lanka was at a moderate level (Sooriyarachchi et al., 2020) This would increase their production and their income. A lack of planting material was another barrier exposed by Dracaena growers in Beliatta. High transportation costs and lack of fertilizer availability in the markets was another challenge. However, organic fertilizers such as Gliricidia leaves can be utilized as a nitrogen source. But there are no organic alternatives for fungicides introduced to the farmers. Also, a lack of awareness of the farmers on Dracaena sanderiana as a profitable foliage crop in the export market will be another challenge when introducing this crop to the selected areas. A study conducted in Bangladesh has identified some suggestions to uplift their floriculture industry; providing trainings for farmers and as well as traders, providing production assistance, storage facilities & building countrywide permanent trading infrastructure, introducing credit policies and packages were among the suggestions (Mou, 2012).

## CONCLUSION/S

Awareness programmes are required to introduce the importance of Dracaena sanderiana as a commercial level export oriented floriculture crop. Growers' willingness to expand their nurseries to cultivate Dracaena is a great potential in this area. Unemployed female labour force will be benefitted with value addition training programmes of D. sanderiana. Government support or loan schemes for initial establishment of growth

structures and irrigation are required. More research on organic fertilizers and pesticides are required with the lack of commercial fertilizers in the market. Free consultation and training programmes conducted along with commercial level Dracaena growers will be helpful in the introduction process.

## REFERENCES

- Census of population and Housing. (2012). Department of Census and Statistics, Sri Lanka.
- Dayarathne, H. M. P. M., Abeysekara, W. C. S. M., Sooriyaarachchi, P., & Sandika, A. L. (2018). Identification of Drivers and Barriers of Women Entrepreneurs: A case study in Floriculture Industry. *Saudi J. Business and Mgt. St*, 2, 891-897.
- Mou, N. H. (2012). Profitability of flower production and marketing system of Bangladesh. *Bangladesh Journal of Agricultural Research*, 37(1), 77-95.
- Sooriyarachchi P, Dayarathna HMPM, Abeysekara WCSM and Sandika AL (2020). Financial Literacy of Women Entrepreneurs in Floriculture Industry: A case study in Battaramulla and Panadura Areas in Sri Lanka. *International Symposium of Agriculture and Environment*, University of Ruhuna
- Sri Lanka labor force survey. (2018). Department of Census and Statistics, Sri Lanka.



## Urban Farming: A Review on Techniques Used in Urban Farming in Mayan Civilizations

Sadani Kulathunga<sup>\*1</sup>, Thilini Perera<sup>2</sup>, TGUP Perera<sup>3</sup> and Chameera Udawattha<sup>4</sup>

<sup>1\*,3,4</sup>Department of Estate Management and Valuation, Faculty of Management Studies and Commerce, University of Sri Jayawardanapura

<sup>2</sup>Department of Plant Science, Faculty of Science, University of Colombo

---

\* Fonseka, kumarifonseka23@gmail.com

---

### ARTICLE INFO

#### Article History:

Received Date: 01 July 2022

Accepted Date: 15 September 2022

#### Keywords:

Urban Agricultural History, Urban Farming History, Mayan Civilizations

#### Citation:

Sadani Kulathunga, Thilini Perera, TGUP Perera and Chameera Udawattha. (2022). *Urban Farming: A Review on Techniques Used in Urban Farming in Mayan Civilizations*. Proceedings of SLIIT International Conference on Advancements in Sciences and Humanities, (11) October, Colombo, 251 - 255.

### ABSTRACT

Urban farming (UF) is emerging in the urban areas of the modern world due to food scarcity in urban areas. Urban agriculture is enjoying a resurgence in popularity that began decades ago. It's now widely acknowledged and accepted as a means of gaining several environmental, economic, and social advantages. However, the cradle of urban farming is from our ancestral civilization. Hence, documenting different urban farming techniques used by our ancestors is very important. Consequently, this study is launched to study how our ancestors used urban farming to feed their ever-growing urban population. To structure the database, the UF-related words and keywords are divided into five categories. After that, using different keyword combinations for both 'history' and UF the online databases Scopus, ScienceDirect and ISI Web of Science (WoS) were searched. The samples presented here demonstrate the diversity of landscapes found in the Mayan Civilizations. Spatial variances in the underlying environment, various environmental changes, and civilizations' adaptability across time all contributed to this heterogeneity. Whether this civilization chose to focus on agriculture in wetlands or dry uplands, how they dealt with the annual problem of the dry season and water availability, and how diverse and nutritious soils were across the broader landscape all showcase

the adaptive strategies used by the civilization to suit the different environmental conditions. Techniques like Raised bed farming in Mayan Civilization, are great examples of their adaptability to the climatic changes using creative solutions. All these civilizations flourished for centuries before their collapse. As a framework for addressing community cohesiveness and food access, Urban farming is entering a new phase. Urban agriculture has the potential to help people adapt to climate change. Mitigation and adaptation will be aided by avoiding reliance on fragile transportation connections, experimenting with seasonality and crop selection, and developing community bonds. When new challenges develop, urban agriculture will be there to meet them, and it will continue to evolve as it reacts to key issues that shape our cities. And to aid this process a comprehensive look at the ancient world's agro-urban civilizations would be very beneficial.

## INTRODUCTION

Urban agriculture can provide a source of food and income for urban people by defining it as "small spaces (e.g., unoccupied plots, gardens, verges, balconies, containers) within the city for growing vegetables and raising small animals or milk cows for own consumption or sale in local markets" (Medici et al., 2021). It contributes to food security and safety, as well as improving environmental quality and greening the country, particularly in urban areas. Urban farming is becoming increasingly important as cities expand to fulfil the demands of a rapidly changing urban environment. Urban agriculture in and around a town, city, or metropolis, largely (re-)uses human and material resources, products, and services found in and around that urban area, and in turn largely supplies human and material resources, products, and services to that urban area (Mougeot LJA, 2000). Small community gardens, peri-urban farming, small farming, urban gardens, the construction of vertical farming or greenhouses are all examples of systems that fall under the umbrella term of urban agriculture in some form or another. These farms promote self-sufficiency in the food chain as well as food safety to a segment of the community. Urban farming has the potential to increase agricultural productivity and sustainability in urban environments.

Urban agriculture is enjoying a resurgence in popularity that began decades ago. It's now widely acknowledged and accepted as a means of gaining several environmental, economic, and social advantages. Many individuals have taken notice, from entrepreneurs and community leaders to the general public. Urban agriculture, whether in the form of vertical farms, rooftop greenhouses, or community gardens, is not a new concept. It truly dates back to the invention of the wheel.

The objective of this study is to explore and identify the available literature on Urban farming in Mayan civilization and the techniques that was used.

## MATERIALS AND METHODS

To structure the database, the UF-related words and keywords were divided into five categories (see Table 1). After that, we experimented with different keyword combinations for both 'history' and UF. The online databases Scopus, ScienceDirect, and ISI Web of Science (WoS) were chosen since they are the most widely utilized in the field. The search was carried out in January of 2022. The first section introduces the concept of urban farming in the ancient world. The next part discusses research techniques, research scope, literature sources, and the filtering process. The results and statistical data from the included publications will be presented thereafter. Benefits, problems, and recommendations are presented in section 4. The limitations and conclusion of the review paper are presented in the final section.

Table 1

Urban Farming (UF)	Urban agriculture Urban Farming/Farms Urban gardening/gardens Urban food systems Community gardening
Vertical agriculture	Vertical farming/vertical farms Vertical farm systems Zero-acreage farming (zfarming) Vertical greenhouses Indoor farms Interior gardens

Urban horticulture	Urban horticultural systems Organoponics Soilless systems Hydroponics Aquaponics Fogponics Aquaculture	<p>urban-type which is best described as 'agro-urban landscapes.' In some agro-urban landscapes, such as the agricultural terracing that intersperses with residential and civic-ceremonial architecture at Caracol (Chase et al., 2011) and the walled gardens at Chunchucmil (Dahlin B. H. et al., 2005) empirical support for urban farming is unequivocal, but the evidence for agriculture in Maya cities is in most cases much more subtle and ambiguous (Isendahl, 2012).</p> <p>A vast pre-Hispanic rainwater reservoir is in the heart of the agro-urban environment, playing an essential economic, political, and symbolic role in the physical alteration and social development of the area (Isendahl C, 2011). On the outskirts of zones of deep and productive soils, 500 m to the south of the reservoir, the major civic ceremonial buildings were located on a series of low hills. Since Maya agro-urban environments were separated into lineage-based communities, each with its government (McAnany, 2013) urban pattern planning was decentralized to some extent.</p> <p>The study of Pre-Columbian lowland Maya tropical urbanism reveals patterns of dispersed urban landscapes marked by a high retention of urban open space within the densely constructed environment (Dunning et al., 2018). Researchers have used several descriptive labels to recognize the relative dispersion of architectural pieces and population over wide expanses of territory. The terms tropical urbanism (Graham, 1996), garden cities (Chase D. Z. &amp; Chase A. F., 1998), green cities (Graham, 1998), agrarian cities (Arnauld, 2008), low-density urbanism (Fletcher, 2009), and agro-urban landscapes (Graham, 1998), capture the idea that the form of lowland Maya tropical urbanism differs from models of urbanism prevalent (Graham &amp; Isendahl, 2018; Isendahl, 2012).</p> <p>It is necessary to include the direct hinterlands, or what is today referred to as peri-urban settlements, to appreciate the peculiarities of major urban centers of lowland Maya society (Simon &amp; Adam-Bradford, 2016). We use the Maya agro-urban landscape name in this work to reflect that the hinterlands and peri-urban communities should be understood as fully interwoven in how the city functioned, rather than perceiving social practice as polarizing the urban centre to the rural hinterland (Evans et al., 2021).</p>
Urban rooftop agriculture (URA)	Building-integrated agriculture Rooftop greenhouses Rooftop farming/farms/gardens Hydroponic rooftop gardening/gardens	
Others	Community gardens Home gardens Agricultural gardens Allotment gardens War gardens Citizen Farms Public parks	

## RESULTS

As a consequence, 60 references were gathered, which had to be refined further. Furthermore, because the focus of our study was solely on Urban Agriculture, we eliminated studies on conventional agriculture from the analysis. Finally, we eliminated all the redundant references. The final count was 40 references for analysis that had both history and UF. The selected references were then divided into three categories in the second phase based on the techniques discussed, such as raised bed farming, terrace farming and other methods.

## DISCUSSION

Pre-Hispanic Maya cities have been described as 'green cities' (Graham E, 1999) 'garden cities' and 'forest gardens' (Dunning N. P. & Beach T, 2011) because of expanding urban sprawl with farmsteads clustering around loci for civic-ceremonial and other urban services (Ford A & Nigh R, 2009).

However, the intermixing of agrarian land-use with urban organizations, as well as the blurring of the conceptual, bio geophysical, and spatial boundaries between city and rural side, suggest that we are dealing with a hybrid of



### **Mayan Farming: Raised Bed Farming**

Raised beds near canals can be seen in Mayan Civilization. The Maya, like the Aztecs, farmed fields that rose above the bajos, or low, swampy places. They dug up the mud from the bottom and placed it on woven reed mats two feet above the water level to create these rich farm zones (Wagner, 1982). Fish, turtles, and other aquatic life might be seen in the canals between the beds. In the water, water lilies sprouted, preventing the water from drying out. Raised bed farming required a lot of effort but yielded a good harvest. Every year, each field produced two or three crops.

### **Mayan Farming: Terrace Farming**

The Maya built terraces on steep hillsides in mountainous locations. A retaining wall holds little fields dug into the hillside. These can be planted with maize or other crops to create a succession of steps that prevent water flow and erosion. These terraces make the most use of land that is either mountainous or hilly. The Maya also used canals to water their crops (Healy et al., 2013).

### **Mayan Farming: Miscellaneous Other Methods**

In addition to from the three agricultural practices described above, the Maya also practised Mesopotamian centres forest gardening, which involved planting trees that supplied them with economic benefits such as food or firewood (Ford & Nigh, 2009). Cacao and gum trees, for example, were encouraged to grow. Maya people also foraged in the woods, seeking tubers, roots, and berries to consume.

### **CONCLUSIONS**

The samples presented here demonstrate the diversity of landscapes found in the Mayan Civilizations. Spatial variances in the underlying environment, various environmental changes, and civilizations' adaptability across time all contributed to this heterogeneity. Whether this civilization chose to focus on agriculture in wetlands or dry uplands, how they dealt with the annual problem of the dry season and water availability, and how diverse and nutritious soils

were across the broader landscape all showcase the adaptive strategies used by these civilizations to suit the different environmental conditions. Techniques like Raised bed farming in Mayan Civilization, are great examples of their adaptability to the climatic changes using the elements at hand.

With time, these civilizations have realized the consequences of soil erosion and have adopted soil conservation technologies to create more stability in their agricultural lands. This further highlights the adaptability of the people of the ancient world. This research on the agri-urban civilizations provide information on the unique urban historical convention. In this paper, it is suggested that this information is crucial in understanding modern urban space planning and contemporary urban processes, expanding the available knowledge on urbanization while providing a greater range of possibilities to consider while thinking about cities in today's world. As urban farming is becoming more and more a topic of discussion, it appears that urban farming was a widespread concept in the ancient world.

All these civilizations flourished for centuries before their collapse. As a framework for addressing community cohesiveness and food access, Urban farming is entering a new phase. Urban agriculture could help people adapt to climate change. Mitigation and adaptation will be aided by avoiding reliance on fragile transportation connections, experimenting with seasonality and crop selection, and developing community bonds. When new challenges develop, urban agriculture will be there to meet them, and it will continue to evolve as it reacts to key issues that shape our cities. And to aid this process a comprehensive look at the ancient world's agro-urban civilizations would be very beneficial.

### **REFERENCES**

Arnauld, M. C. (2008). Maya urbanization, agrarian cities in a preindustrial world. *Urbanización maya: ciudades agrarias en un mundo pre-industrial*. In Mastache; A.G., Cobean; R.H., Cook; A.C., & Hirth; K.G (Eds.), *El urbanismo en Mesoamérica = Urbanism in Mesoamerica* (2nd ed., pp. 1–36). Pennsylvania State University, Mexico & University Park.

- Chase D. Z., & Chase A. F. (1998). Scale and intensity in Classic period Maya agriculture: terracing and settlement at the "garden city" of Caracol, Belize. *Culture and Agriculture*, 20, 60–77.
- Chase, A. F., Chase D. Z., Weishampel J. F., Drake J.B., Shrestha R.L., Slatton K.C., Awe J.J., & Carter W.E. (2011). Airborne LiDAR, archaeology, and the ancient Maya landscape at Caracol, Belize. *Journal of Archaeological Science*, 38, 387–398.
- Dahlin B. H., Beach T., Luzzadder-beach S., Hixson D., Hutson S., Magnoni A., Mansell E., & Mazeau D. (2005). Reconstructing agricultural self-sufficiency at Chunchucmil, Yucatan, Mexico. *Ancient Mesoamerica*, 16, 229–247.
- Dunning N. P., & Beach T. (2011). Farms and forests: spatial and temporal perspectives on ancient Maya landscapes. In Martini I.P. & Chesworth W. (Eds.), *Landscapes and societies: selected cases* (pp. 369–389). Springer.
- Dunning, N. P., Beach, T., Graham, E., Lentz, D., & Luzzadder-Beach, S. (2018). Maize, manioc, mamey, and more : Pre-Columbian lowland Maya agriculture. *The Archaeology of Caribbean and Circum-Caribbean Farmers (6000 Bc–Ad 1500)*, 329–352.
- Evans, D. L., Vis, B. N., Dunning, N. P., Graham, E., & Isendahl, C. (2021). Buried solutions: How Maya urban life substantiates soil connectivity. *Geoderma*, 387, 114925.
- Fletcher, R. (2009). Low-density, agrarian-based urbanism: a comparative view. *Institute of Advanced Studies Insights*, 2(4), 2–19.
- Ford A, & Nigh R. (2009). Origins of the Maya forest garden: Maya resource management. *Journal of Ethnobiology*, 29, 213–236.
- Graham, E. (1996). Maya cities and the character of a tropical urbanism. In P. Sinclair (Ed.), *The development of urbanism from a global perspective*. Uppsala University.
- Graham, E., & Isendahl, C. (2018). Neotropical Cities as Agro-Urban Landscapes: Revisiting 'Low-Density, Agrarian-Based Urbanism. In A. Ekblom, C. Isendahl, & K.-J. Lindholm (Eds.), *The Resilience of Heritage. Cultivating a Future of the Past. Essays in Honour of Professor Paul J.J. Sinclair* (pp. 165–180). Uppsala University Press.
- Healy, P. F., Lambert, J. D. H., Amason, J. T., & Hebda, R. J. (2013). Caracol, Belize: Evidence of Ancient Maya Agricultural Terraces. [Http://Dx.Doi.Org/10.1179/009346983791504200](http://Dx.Doi.Org/10.1179/009346983791504200), 10(4), 397–410.
- Isendahl, C. (2012). Agro-urban landscapes: the example of Maya lowland cities. 1112–1125.
- McAnany, P. A. (2013). *Living with the ancestors: Kinship and kingship in ancient Maya society*. (Vol. 1). Cambridge University Press
- Simon, D., & Adam-Bradford, A. (2016). Archaeology and contemporary dynamics for more sustainable, resilient cities in the peri-urban interface. In *Balanced urban development: Options and strategies for liveable cities* (pp. 57–83). Springer, Cham.
- Wagner, P. L. (1982). Wilhelmy's Geographical Appraisal of Mayan Civilization. *Geographical Review*, 72(2), 223.
- This research is funded by the Research council of the University of Sri Jayewardenepura by the grant ref : ASP/01/RE/MGT/2022/43



## Social and Economic Effects of the Cultivation of *Solanum Virginianum*; A Case Study in Anamaduwa DS Division, Sri Lanka

Siriwardena B. P<sup>1\*</sup>, Vidanapathirana N. P<sup>2</sup>, Ketipearachchi K. G<sup>3</sup>, Rajasekara L. R. W. D. M<sup>4</sup>  
<sup>1,2,3,4</sup> University of Colombo Institute for Agro Technology and Rural Sciences

\* Siriwardena, buddhika@uciars.cmb.ac.lk

### ARTICLE INFO

#### Article History:

Received Date: 01 July 2022

Accepted Date: 15 September 2022

#### Keywords:

Cultivation; Economical; Farmers; Social;  
*Solanum virginianum*

#### Citation:

Siriwardena B. P, Vidanapathirana N. P, Ketipearachchi K. G, Rajasekara L. R. W. D. M. (2022). *Social and Economic Effects of the Cultivation of Solanum Virginianum; A Case Study in Anamaduwa DS Division, Sri Lanka*. Proceedings of SLIIT International Conference on Advancements in Sciences and Humanities, (11) October, Colombo, 256 - 260.

### ABSTRACT

*Solanum virginianum* is a plant which belongs to the Solanaceae family that is used for medicinal purposes. This plant is rather widespread in Sri Lanka and the advantages of farming these plants might either be for economic or for social purposes. In none of the research that has been undertaken so far has the significance of these socioeconomic outcomes been highlighted. Consequently, this study's objective is to investigate the economic and social implications of farmers' cultivation of *Solanum virginianum*. For the study, seventy (70) farmers who cultivate *Solanum virginianum* were selected from the Anamaduwa Divisional Secretariats Division in Sri Lanka's North-western Province. Using a stratified random sampling technique, all respondents in the sample were requested to complete a pre-tested, standardized questionnaire form. Qualitative data was gathered by using a five-point Likert scale ranging from strongly disagree to strongly agree. Most farmers are male, between the ages of 41 and 50, and they possess a high school diploma. In addition, many of them are married. Farmers in the region rely not just on the production of *Solanum virginianum*, but also on a variety of other crops, and many farmers in the sample have extremely low incomes. The study determined that when economic and sociological elements were integrated, the

dependent variables did not produce statistically significant outcomes. In addition, the between-subject effects of economic and social factors seen during *Solanum virginianum* production were not statistically significant. Therefore, the authorized individuals should be concerned with these effects to increase the cultivation of *Solanum virginianum* for the Sri Lankan medicinal industry.

## INTRODUCTION

Katuwelbatu (*Solanum virginianum*) is a common name of a plant that is used for medicinal purposes and is a member of the Solanaceae family (Pereira et al., 2019). The plant is somewhat common to Sri Lanka, where it grows in arid regions which are horizontal with the ground. It should be noted that the therapeutic characteristics of the plant, [it] provides numerous benefits to human health (Amir and Kumar, 2004). Demand for herbal products in every region of the world has been consistently increasing on a yearly basis. This plant is planted in the country because of the increased demand for it as a crop for therapeutic purposes. The benefits of cultivating these plants can take the form of either economic or societal advantages. The importance of these socioeconomic consequences is not stressed directly in any of the research that has been conducted to date. Considering, the objective of this study, it is to investigate the consequences of growing *Solanum virginianum* in terms of both the economy and the society.

## MATERIALS AND METHODS

### Study area

Sri Lanka's North-Western province is where *Solanum virginianum* (Katuwelbatu) cultivation is most prevalent. The study location was therefore the Anamaduwa DS division, where sufficient numbers of farmers cultivate *Solanum virginianum* (Katuwelbatu) plants for medical purposes. In the North-Western province of Sri Lanka, the Anamaduwa DS division contains thirty-five (35) Grama Niladhari divisions.

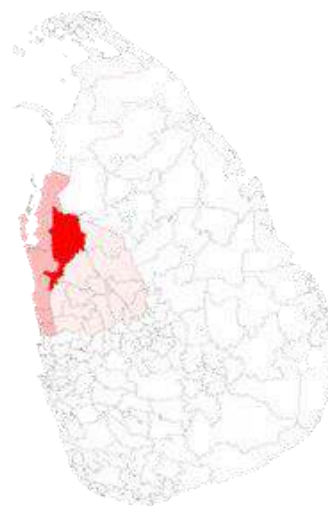


Figure 01. Anamaduwa Divisional Secretariate area

### Sample Selection

Seventy (70) *Solanum virginianum* cultivating farmers from all GN Divisions in the Anamaduwa DS division were chosen for this study (two farmers from each GN divisions). The sample technique employed for the investigation was stratified random sampling.

### Data Collection

By analyzing both primary and secondary data, the study's objectives can be accomplished. Secondary data were acquired from previously published literature, while primary data were obtained from a pre-tested survey questionnaire. According to the study's aims, variables were incorporated into the questionnaire's design. To measure the identified factors, a Likert scale ranging from strongly disagree (1) to strongly agree (5) was established.

### Variables and measurements

Concerning demographic and socioeconomic characteristics, gender, age, marital status, primary source of income, education level, and monthly income were utilized.

Farmers' cultivation of *Solanum virginianum* was evaluated using the following variables to determine its social and economic impact.

Table 01. Operational variables of the study

Factor	Sub factors
Production of <i>Solanum virginianum</i>	<ul style="list-style-type: none"> <li>Extent of cultivation</li> <li>Profitable</li> <li>Easy to cultivate</li> <li>Disease resistance</li> <li>Climate suitability</li> <li>Irrigation</li> </ul>
Sociological impact from <i>Solanum virginianum</i> farming	<ul style="list-style-type: none"> <li>Infrastructure development</li> <li>Livelihood development</li> <li>Real state value</li> <li>Knowledge on medicinal plants</li> <li>Knowledge dissemination</li> <li>Relationship developments</li> </ul>
Economic impact from <i>Solanum virginianum</i> farming	<ul style="list-style-type: none"> <li>Supply and Demand</li> <li>Net income</li> <li>Marketing linkages</li> <li>Employment opportunities</li> <li>Value added services</li> <li>Market price</li> </ul>

## RESULTS AND DISCUSSION

### Demographic and socio-economic status of the *Solanum virginianum* growing farmers

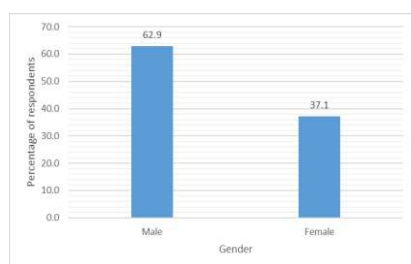


Figure 02. Gender distribution

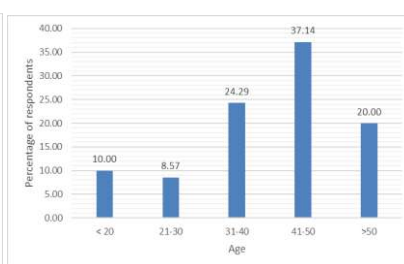


Figure 03. Age distribution

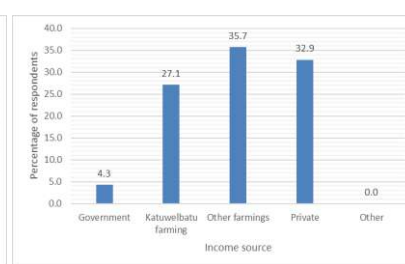


Figure 04. Income source distribution

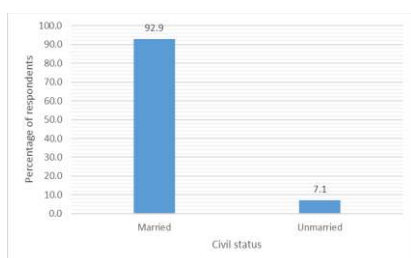


Figure 05. Marital status distribution

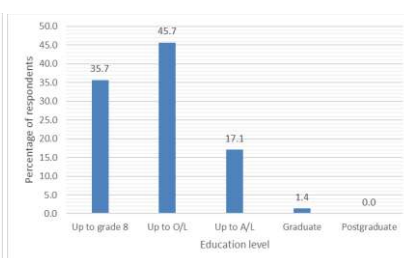


Figure 06. Education level distribution

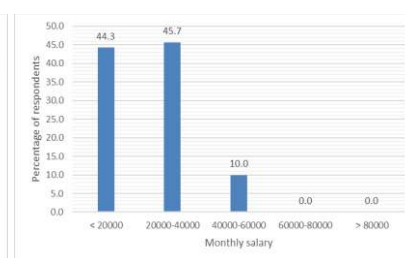


Figure 07. Income distribution

Cultivation in the arid zone is particularly difficult for females, as seen in figure 02, where the percentage of male respondents (63%) is greater than the number of female respondents (37%). Figure 03 depicts that most farmers are between the ages of 41 and 50 (37%) when compared to other age groups, this is mostly because this type of agriculture requires a great deal of experience. Farmers in the region depend not just on the production of *Solanum virginianum*, but also on a variety of other

crops. As shown in figure 04, most respondents (36%), except for those engaged in *Solanum virginianum* farming, derive most of their income from other types of farming. According to the data, farmers participate in a variety of income-generating activities to maintain their standard of living. According to figure 05, many farmers are married (93%) and relatively few are single (7%). The selected area is rural; therefore, the farmers lack education. figure 06 demonstrates that many farmers (46%) have a

primary or secondary education. A greater proportion of farmers (46%) have incomes between 20,000 and 40,000 rupees (figure 07).

### **Social and economic aspects of growing *Solanum virginianum***

#### **I. Reliability analysis test for the selected variables**

This test examines the degree of internal consistency between a variable's several measurements. The Cronbach alpha coefficient was used to assess the reliability of the latent variables (Tavakol and Dennick, 2011). According to the SPSS Survival Manual (Pallant, 2013), Cronbach's Alpha equal to or more than 0.70 with a significant value of  $P < 0.05$  shows the reliability and validity of a research instrument, in addition it reveals a better level of internal consistency. It was observed that Cronbach's Alpha is greater than 0.60 and that the study's instruments fell within a suitable range. The coefficient alphas (reliability estimates) for the dependent variables

Economic factors (EC) and Sociological factors (SO) were 0.851 ( $p < 0.05$ ) and 0.800 ( $p < 0.05$ ), respectively. The estimated reliability (alpha coefficients) for the independent variable Production factor (PR) was 0.601 ( $p < 0.05$ ). These values are all within the allowed range. The production variable had a mean value of 3.53, the economic variable had a mean value of 3.95, and the sociological variable had a mean value of 3.82.

#### **II. Multivariate Analysis of Variance (MANOVA) on Production factors (PR) in relation to Economic (EC) and Sociological factors (SO) of *Solanum virginianum* farmers**

##### **a. Multivariate test**

Wilk's Lambda is a level of significance used in MANOVA to determine if the means of designated groups of subjects differ on a collection of dependent variables. Each of the two dependent variables can express and evaluate its significant value for the test of between-subject effects.

Table 02. Multivariate test

Effect		Value	F	Hypothesis df	Error df	Sig.
Production	Wilks Lambda	0.656	1.197	22	112.00	0.265

The Wilks Lambda significance level is not significant in Table 02 and indicates that there are no differences in the means of the subjects in the identified groups of subjects across the set of dependent variables.

##### **b. Tests of between subject effects**

Table 03. Tests of between subject effects

Source	Dependent Variable	df	Mean square	F	Sig.
Corrected model	Economic impact	11	0.341	1.633	0.114
	Sociological impact	11	0.156	0.831	0.611

Both economic and social variables were not significantly distinct ( $p$  value  $> 0.05$ ) from other variables when we considered the variables listed in Table 03 with various levels. The farmers of the selected region were not significant social and economic impact on cultivating the *Solanum virginianum*. The reasons for the non-significance of those variables were due to the limitations on desired cultivations. Hence, they were not able to achieve optimum harvest. Due to restrictions on intended cultivations, those variables not substantial, making it difficult for them to produce an ideal harvest.

### **CONCLUSION/S**

The primary purpose of the study is to investigate the impact of *Solanum virginianum* production on the economic and social characteristics amongst farmers in the selected region. The study found that when both economic and sociological factors were combined, the dependent variables did not provide significant results. In addition, the between-subject effects that were seen during the production such as economic and social impact of *Solanum virginianum* were not significant. Most farmers are male, fall between

the ages of 41 and 50, and have completed their primary and secondary schooling. Additionally, many of them are married. Taking all this into consideration, authorized personnel should be concerned with these impacts in order to promote the production of *Solanum virginianum*. Identifying these consequences is crucial for the future production of *Solanum virginianum* in Sri Lanka specially for the medicinal industry.

## REFERENCES

Amir, M., & Kumar, S. (2004). Possible industrial applications of genus *Solanum* in twenty first century-A review.

Pallant, J. (2013). SPSS survival manual. McGraw-Hill Education (UK).

Pereira, A. P. A., Angolini, C. F. F., Adani, H. B., Usberti, F. C. S., Paulino, B. N., Clerici, M. T. P. S., ... & Pastore, G. M. (2021). Impact of ripening on the health-promoting components from fruta-do-lobo (*Solanum lycocarpum* St. Hill). *Food Research International*, 139, 109910.

Tavakol, M., & Dennick, R. (2011). Making sense of Cronbach's alpha. *International journal of medical education*, 2, 53.



## Abandonment of paddy lands and its causal factors in Bentota Pahalagamhaya Agrarian service division, Sri Lanka

A.H Hansika<sup>\*1</sup>, S.T.C Amarasinghe<sup>2</sup>, T.G.I Sandamali<sup>3</sup>

<sup>1</sup>Department of Agribusiness Management, Faculty of Agricultural Sciences, Sabaragamuwa University of Sri Lanka

<sup>2</sup>Department of Agribusiness Management, Faculty of Agricultural Sciences, Sabaragamuwa University of Sri Lanka

<sup>3</sup>Rice Research Station, Bentota

### ARTICLE INFO

#### Article History:

Received Date: 01 July 2022

Accepted Date: 15 September 2022

#### Keywords:

Multiple regression; paddy land abandonment; rice cultivation; willingness to re-cultivate

#### Citation:

A.H Hansika, S.T.C Amarasinghe, T.G.I Sandamali (2022). *Abandonment of paddy lands and its causal factors in Bentota Pahalagamhaya Agrarian service division, Sri Lanka*. Proceedings of SLIIT International Conference on Advancements in Sciences and Humanities, (11) October, Colombo, 261 - 265.

### ABSTRACT

Paddy is the most significant and highly valued crop in Sri Lanka. Paddy cultivation has been given top priority in the agriculture industry due to its strong links to food security and the socio-economic development of the rural community. Paddy is the most significant commercial crop in the Galle district of the Low Country Wet Zone (LCWZ). However, the Galle district has a substantial amount of abandoned paddy land due to various circumstances. Abandoned paddy lands have an impact on paddy production, rural livelihood and food security in Sri Lanka. Therefore the objectives are to identify factors affecting paddy land abandonment and farmers' willingness to re-cultivate abandoned paddy lands in Pahalagamhaya Agrarian service division. One hundred paddy farmers with abandoned paddy lands were selected by purposive sampling while adopting a questionnaire survey method to perform multiple regression analysis and descriptive statistics. Frequent flood conditions, wild animal damage, poor drainage system, salinity and inadequate infrastructure facilities were identified as the factors that affect paddy land abandonment according to the results of multiple regression analysis. Descriptive statistics revealed that 69% of farmers are willing to re-cultivate abandoned

\* Hansika, hansikahasini4@gmail.com



paddy lands. The findings will aid the government and other responsible organizations in the effective management and control of the factors that cause paddy land abandonment in Bentota, Pahalagamhaya Agrarian service division. Reducing the number of abandoned paddy lands will help boost the food security in this area.

## INTRODUCTION

Rice is the staple food of the Sri Lankan inhabitants. Paddy crops are planted as a wetland crop in every district. The paddy sector in Sri Lanka has played a significant role in fulfilling the country's food requirements. Low Country Wet Zone (LCWZ) always serves as a buffer zone for rice production (Wickramasinghe et al., 2016). In order to secure national food security, it is critical to boost the productivity of rice lands in the LCWZ. Paddy is the main commercial crop in the Galle districts of Sri Lanka's LCWZ. Despite the district's paddy field extent, the paddy planted extent in Galle district has declined significantly since 2008 due to numerous socio-economic and political causes (Silva & Gunasekara, 2022). Only 245 hectares of paddy lands were cultivated in 2013, compared to 2524 hectares in 1983, in the Bentota area. It is dreadful to see 1385 hectares of abandoned paddy fields that have not been used for anything yet (Piyadasa et al., 2018). According to the Department of Agrarian Development (DOAD, 2022), Kalutara and Galle districts have the most cultivable paddy fallow lands, with 12,456 acres and 10,005 acres, respectively. Bentota river basin is below the agricultural production capacity level and no strategy has been implemented or introduced so far regarding these vast abandoned paddy lands.

The objectives of this study are to identify the factors affecting paddy land abandonment in Bentota Pahalagamhaya Agrarian service division and to identify the farmers' willingness to re-cultivate abandoned paddy lands. Identifying causal factors of paddy land abandoning would be helpful to improve paddy production by resolving the problems. The implementation of this research in Bentota, Pahalagamhaya Agrarian service division in Galle district will reduce the tendency of abandoning paddy lands in this area by providing a considerable contribution to Galle district paddy production. The finding of this

study will assist prospective researchers and academics to identify where future research is required and provide knowledge to develop land management plans and programs for rural development stakeholders, other land management agencies and the government.

## MATERIALS AND METHODS

Bentota, Pahalagamhaya Agrarian service division was selected as the study area where a total of 100 paddy farmers were selected through the purposive sampling technique during the primary data collection through the survey strategy. A structured questionnaire was designed to collect the primary data for the study. The questionnaires were distributed among paddy farmers who have abandoned paddy lands in the Bentota area. In this research secondary data was gathered from the Department of Census and Statistics, Central bank, Department of Agriculture, Rice Research Station Bentota, Journal articles, Publications and websites. The questionnaire consisted of three major sections. The first section was adapted to gather demographic and paddy cultivation-related information with open-ended and close-ended questions. Section two focused on information related to factors affecting paddy land abandonment. A Five-point Likert scale was used to gather information under this section (1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree). The third section was used to identify farmers' willingness towards paddy land re-cultivation.

Multiple regression analysis, descriptive statistics, normality, reliability and validity tests were used to analyze the data. SPSS 22 version and MS Excel 2010 version were used to statistically analyze the data. Descriptive statistics were used to analyze primary data such as demographic information and farmers' willingness towards re-cultivation using frequencies and charts. Multiple regression analysis was used to analyze causal factors of paddy land abandonment.

## RESULTS AND DISCUSSION

In this study, a total of 100 paddy farmers were investigated. According to demographic and farming data, the majority of farmers (76 percent) were male and 24 percent were female farmers. The majority of farmers were

married (92 percent) and others were single (18 percent). The majority of farmers (55) have acquired primary education, while others 40, 3, and 2 percent have received secondary education, diploma and degree, respectively. The majority of farmers (31 percent) had 4 members in their families while 21, 19, 12, 9, 6 and 2 percent had 3, 5, 6, 2, 7 and 1 members in their families respectively.

Considering the paddy farming experience, 78 percent of farmers had more than 20 years of experience in paddy farming. Furthermore,

the majority of the farmers (31 percent) had 1 acre of abandoned paddy lands and 21 percent of farmers had 0.5 acres of abandoned paddy lands. When considering the time period of paddy lands abandonment, the majority of farmers (55 percent) have abandoned their paddy lands for 6-15 years while 15, 13, 9 and 8 percent of farmers have abandoned their paddy lands for, Less than 5 years, 16-25 years, 36-45 years and 26-35 years respectively.

Table 1: Coefficient results of regression analysis

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	-.988	.607		-1.628	.107
<b>Environmental Factors</b>					
Salinity	.184	.069	.170	2.661	.009
Rainfall patterns	.104	.064	.095	1.619	.109
Frequently flooding	.214	.080	.176	2.683	.009
Wild animal damage	.891	.165	.672	5.416	.000
Pest and diseases	.026	.073	.020	.354	.724
<b>1 Technological Factors</b>					
Drainage system	-.431	.087	-.286	-4.974	.000
Machineries and equipment	.108	.063	.097	1.721	.089
Infrastructure facilities	-.243	.097	-.218	-2.498	.014
<b>Institutional Factors</b>					
Credit facilities	.102	.106	.083	.964	.338
Government support	.026	.078	.022	.331	.741

a. Dependent Variable: Abandoned land extent

According to the results salinity ( $\beta = 0.184$ ,  $p < 0.01$ ) has a positive effect on paddy land abandonment. Rice yield is affected by salinity level at or above 3.0dS/m (Grattan et al., 2002, Othaman et al., 2020). The productivity of most of the paddy-growing lands in Bentota area may decline due to salinity problems that occur by the changing climate conditions. The salinity level of the Bentota Pahalagamhaya Agrarian service division coastal paddy lands increases due to salt accumulation through tidal waves and seawater intrusion both linked to climate-induced sea level.

Frequent flood condition ( $\beta = 0.214$ ,  $p < 0.01$ ) also has a significant effect on paddy land abandonment. The major problem in the wet zone seems to be drainage when annual rainfall exceeds 2000mm (Dhanapala, 2005). Because of high rainfall intensity, flood conditions can affect the low-lying rice fields in Bentota.

According to the Rice Research Center 2022, Bentota, annual rainfall recorded as 3139.3mm, 1968.7mm, 2892.5mm, 2320.6mm, 3342.8mm, 2235.8 mm, and 2620.2mm in 2015, 2016, 2017, 2018, 2019, 2020 and 2021 respectively.

Wild animal damage ( $\beta = 0.891$ ,  $p < 0.01$ ) has a positive significant effect on paddy land abandonment. Mostly wild pig has affected the abandonment of paddy lands. Farmers in this area are facing a serious threat from wild animals. Because of wild animal damage, the yield has decreased over time. It has been a severe effect on paddy land abandonment. Environmental factors such as rainfall patterns ( $\beta = 0.104$ ,  $p > 0.10$ ), and pests and diseases ( $\beta = -0.026$ ,  $p > 0.10$ ), have no significant effect on paddy land abandonment.

Drainage system ( $\beta = -0.431$ ,  $p < 0.01$ ) has a negative relationship with paddy land abandoning. So the poor drainage system in this

area has led to an increase of paddy land abandonment. Farmers have neglected paddy farming due to water drainage issues. It was difficult to drain water from the fields in a timely manner due to poor water canal maintenance. Because of the poor drainage systems, the entire crop was sometimes lost during heavy rains which led to submerged conditions and thus led to the abandonment of paddy lands.

Infrastructure facilities ( $\beta = -0.243$ ,  $p < 0.05$ ) have a negative effect on paddy land abandoning. Poor infrastructure facilities have led to an increase of paddy land abandonment. It was difficult to cultivate paddy with the poor access roads to paddy field. Therefore farmers have abandoned paddy lands due to the lack of infrastructure facilities in this area. According to the regression analysis machinery and equipment ( $\beta = 0.108$ ,  $p > 0.10$ ) have not affected paddy land abandonment.

When considering institutional factors, there was no effect from institutional factors on paddy land abandonment as credit facilities ( $\beta = 0.102$ ,  $p > 0.10$ ) and government support ( $\beta = 0.026$ ,  $p > 0.10$ ) have not affected paddy land abandonment.

From the analysis, the following regression equation was obtained

$$\hat{Y} = -.988 + (0.184) X_1 + (0.214) X_2 + (0.891) X_3 - (0.431) X_4 - (0.243) X_5 + \epsilon$$

$\hat{Y}$  = Abandoned land extent (Dependent variable)

$X_1$  = Salinity

$X_2$  = Frequent flooding

$X_3$  = Wild animal damage

$X_4$  = Drainage system

$X_5$  = Infrastructure facilities

$\epsilon$  = Error term

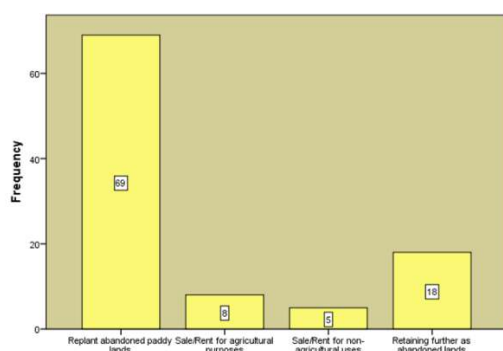


Figure 1: Farmers' willingness to re-cultivate the abandoned paddy lands in the Pahalagamhaya Agrarian service division

Figure 1 reports farmers' willingness (in the Pahalagamhaya area) to replant abandoned paddy lands to maintain the food security of the country. The results indicate that 69% of paddy farmers are willing to replant abandoned paddy fields. 18% of farmers are willing to be retained further as fallow lands. 8% of farmers are willing to sell/rent for agricultural purposes while 5% of farmers are willing to sell/rent for non-agricultural purposes.

## CONCLUSION

It can be concluded that high salinity, frequent flood condition, poor drainage system, lack of access roads to paddy fields and wild animal damage have a significant effect on paddy land abandonment in the selected area. Use of rice varieties that can withstand saline conditions and submergence, maintaining proper drainages systems, building and maintaining bunds, wherever possible in the Pahalagamhaya area to eliminate seawater intrusion during the more dangerous months are some suggestions to alleviate the problem. Further, building fences to prevent wild animal damage and the development of the rural infrastructure such as road facilities by the government will reduce farmers' difficulties and will help to reduce the abandoned paddy land extent and further abandoning. Further results revealed that the majority of respondents willingness to re-cultivate abandoned paddy lands. Identifying and providing solutions for those factors will increase the farmers' willingness towards re-cultivation, thus decreasing the abandoned paddy land extent in this area.

## ACKNOWLEDGMENT

I convey my heartfelt gratitude to my supervisors, all lectures in the department of Agribusiness Management, Agriculture faculty, Sabaragamuwa University of Sri Lanka and staff members of Rice Research Station, Bentota.

## REFERENCES

- Dhanapala, M. P. (2005). The wet zone rice culture in Sri Lanka: A rational look. *Journal of the National Science Foundation of Sri Lanka*, 33(4), 277-279. <https://doi.org/10.4038/jnsfsr.v33i4.2119>

- Grattan, S. R., Shannon, M. C., Roberts, S. R., & Zeng, L. (2002). Rice is more sensitive to salinity than previously thought. December, 189–195.
- Piyadasa, R. U. K., Ranasinghe, T. K. G. P., & Herath, H. M. M. S. D. (2018). Enhancing Community Resilience via Sustainable Management of Abandoned Paddy Lands in Bentota, Sri Lanka. *Colombo Journal of Multi-Disciplinary Research*, 3(2), 45.
- Silva, K. N. N., & Gunasekara, S. D. W. (2022). Analysis of the paddy cultivation pattern in Galle and Matara districts in the Southern province of Sri Lanka. *Journal of Agro-Technology and Rural Sciences*, 1(2), 6.
- Wickramasinghe, W. R. K. D. W. K. V., Gunarathne, S. P., Jayasundara, D. M., Sajeewani, H. A. I., Samarathne, K. D. S., & Kannangara, J. B. K. (2016). PERFORMANCE OF BW RICE VARIETIES GROWN IN THREE DIFFERENT SOIL. *TROPICAL AGRICULTURIST*, 164, 137–147.
- DOAD. (2022). Department of Agrarian Development. Retrieved 04 16, 2022, from [agrariandep.gov.lk:https://www.agrariandept.gov.lk/web/index.php?option=com\\_content&view=article&id=56&Itemid=148&lang=en#information-regarding-paddy-lands](https://www.agrariandept.gov.lk/web/index.php?option=com_content&view=article&id=56&Itemid=148&lang=en#information-regarding-paddy-lands)

# **Nursing & Health Sciences**



## Common Maternal and Neonatal Outcomes of Pregnancies Diagnosed with Endometriosis

E. A. K. Epaarachchi<sup>\*1</sup>, B. S. S. De Silva<sup>2</sup>

<sup>1</sup>\*Sri Lanka Institute of Information Technology

<sup>2</sup>The Open University of Sri Lanka

### ARTICLE INFO

#### Article History:

Received Date: 01 July 2022

Accepted Date: 15 September 2022

#### Keywords:

Endometriosis, Maternal outcomes, Neonatal outcomes, adverse effects.

#### Citation:

E. A. K. Epaarachchi, B. S. S. De Silva. (2022). *Common Maternal and Neonatal Outcomes of Pregnancies Diagnosed with Endometriosis*. Proceedings of SLIIT International Conference on Advancements in Sciences and Humanities, (11) October, Colombo, 267 - 274.

### ABSTRACT

Endometriosis is a progressive stirring disease marked by the appearance of endometrial glands and stroma exterior of the uterus. It affects 8%–10% of reproductive-age women, and is linked to develop primary or secondary infertility in 30% of these women. The main objective of this systematic review was to critically analyse the current related literature to explore the maternal and neonatal outcomes of pregnancies diagnosed with endometriosis. Pregnant women with endometriosis are more likely to develop negative pregnancy outcomes and complicated neonatal outcomes, and therefore they may benefit from extra screening and early detection. Related literature within 5 years (2016 - 2021) was searched from databases like CINAHL, MEDLINE, and PUBMED. Additionally, a few numbers of studies prior to 2016 were taken due to the availability of related information. A total number of 23 articles related to the search criteria was found and out of that, eight articles were selected due to their extreme relevancy. After critically analysing the eight studies authors explored that pregnant women diagnosed with endometriosis are at elevated risk to develop Placenta previa, hypertensive disorders, postpartum hemorrhage, emergency caesareans and preeclampsia as common maternal outcomes and premature birth, Low birth weight and still birth as common neonatal

\* Epaarachchi, kumudumalie93@gmail.com

outcomes. In conclusion, women with endometriosis are at elevated risk of developing adverse maternal and neonatal outcomes in their pregnancies.

## INTRODUCTION

Endometriosis is a progressive stirring disease marked by the appearance of endometrial glands and stroma exterior of the uterus (Leyland et al., 2010). Furthermore, it is associated with chronic pelvic pain, which often affects 8%–10% of reproductive-age women, and it is linked to primary or secondary infertility in 30% of these women (Velasco, 2004). However, endometriosis can continue as a minor or non-existent condition in some cases, or it can disappear on its own in others (Ozkan et al., 2008). But, there have been many studies in literature especially within the past 10 years, showing increasing evidence on the association between endometriosis and increased risk of pregnancy complications such as placenta Previa, hypertensive disorders of pregnancy (HDP), small for gestational age (SGA), placental abruption, postpartum hemorrhage (PPH) and neonatal complications, such as preterm birth and low birth weight (Chen et al., 2018; Berlac et al., 2017; Healy et al., 2010).

In related to many of these cases, endocrine and ovulatory abnormalities in women with endometriosis include luteinized unruptured follicle syndrome, compromised folliculogenesis, luteal phase defect, and premature or multiple luteinizing hormone (LH) spikes, all of which have a significant effect on their pregnancies and outcomes (Practice Committee of the American Society for Reproductive Medicine, ASRM, 1996). Invasion and tissue penetration, development of endometriomas or “chocolate cysts”, extreme pelvic adhesions, or pelvic blockage that may damage other organs, as well as pelvic carcinomas, can trigger severe symptomatology (Oxholm, 2007). Furthermore, currently there is no satisfactory treatment for all endometriosis patients; endometriosis treatments are problematic because they can reduce pain, increase pregnancy symptoms and outcomes, and also improve infertility, but they do not cure the disorder. However, it can be concluded that having endometriosis may lead to developing serious complications in pregnancies. Consequently, to overcome the

possible negative outcomes, clinicians should be aware of the potential endometriosis-related complications, particularly during pregnancy and labor (Farland et al., 2019). The prevalence of endometriosis has been studied in a variety of ways, with diverse estimates reflecting the variations in diagnosis parameters and population size (Berlac et al., 2017). Therefore, increased interest towards endometriosis around the world resulted in finding long-term health and endometriosis-related comorbid conditions in both women and newborns (Farland et al., 2019). Consequently, many research works have been conducted to identify the maternal and neonatal outcomes related to endometriosis and are reviewed with different and occasionally contrastive outcomes. Through this systematic review, the researcher intended to synthesize and discuss the common possible outcomes of pregnant women diagnosed with endometriosis, and adverse neonatal outcomes associated with endometriosis.

## METHOD AND MATERIALS

In the current study, a systematic review method is followed as the study design. Literature from following online databases like CINAHL, MEDLINE and PUBMED is used as search libraries to collect relevant literature for the topic maternal and neonatal outcomes of pregnancies diagnosed with endometriosis. Retrospective cohort studies and primarily written articles which are less than 5 years ago were considered and their eligibility criteria for the study are based mainly on the PICO approach, date of publication, and the study design. Articles on the neonatal and maternal outcomes of pregnant mothers with diagnosed endometriosis were considered for the study, and no restrictions were made based on the country, patient's age, and race. Using the keywords ‘Endometriosis’, ‘Maternal outcomes’, ‘Neonatal outcomes’, and ‘Adverse effects’, a total number of 1569 related articles were found and of which 825 articles from CINAHL, 505 articles from MEDLINE and 239 articles from PUBMED. Out of which articles in duplicates, not in English language or English translations and subsequently further modified and restricted for the search keywords were excluded, reducing the number of total articles to 709.

The article's title and abstract were appraised, and the search period was confined to a time span from 2016 to 2020. After the above process, further 646 articles were excluded from the filtered literature, and the number of related articles was reduced to 63. After conducting a further eligible review of the selected 63 articles, the number of related literature was further reduced to 23 articles. Eventually, the selected 23 articles from the search databases were subjected to filter according to their methodological quality and research findings. After the exclusion of all irrelevant articles, 8 research articles were finalized for the systematic review using the PRISM flow chart (Figure 1).

Furthermore, full-text articles in English or translations were considered in the inclusive criteria. The researcher excluded the studies that are not reliably extracted, duplicates, or consisting of overlapping data. Furthermore, articles not in the English language and articles with no full-text availability are also being excluded.

## RESULTS

Each study is critically analyzed in terms of study design, sample size, sample type, exclusive criteria, comprehensive criteria, data analysis, and key findings based on data availability (Table 1). The results of the eight selected studies lead to the conclusion that endometriosis during pregnancy can cause negative pregnancy outcomes for both women and neonates. According to the results, postpartum haemorrhage, emergency caesareans, placenta Previa, Hypertensive disorders, preeclampsia, and GDM are identified as common maternal outcomes of pregnancies diagnosed with endometriosis. Preterm deliveries, low birth weight, and stillbirth are identified as common neonatal outcomes. Therefore, the two main themes emerged after analysing the findings by the researcher, which are as follows. Theme 1- Pregnant mothers are under high risk. Theme 2- Keep awareness of neonates.

## DISCUSSION

Related literature within 5 years (2016-2021) was taken for research, and few related literature over 5 years was taken due to the availability of relevant information.

Nevertheless, as with a comprehensive review of observational studies, it is constrained by the nature and variability of the studies used. Most of the papers found during the search process are closely related to the research topic, making it easy for researchers to find the right solution to their current problem. However, control composition was not standardized in most trials, and some studies used a wider range of controls compared to the affected groups. As a result, there is a risk of reliability, and prejudice issues when considering the results. Despite these restrictions, some studies have taken into account or limited the amount of time, equality, and pregnancy. These variables contributed to the heterogeneity of the study, as expected in a systematic empirical sample.

However, the two themes emerged after analysing the final results from eight eligible studies discussed in the Discussion.

### **Pregnant mothers are under high-risk**

Endometriosis has been linked to several adverse pregnancy outcomes in previous studies (Brosen et al., 2012, Chen et al., 2018). However, Maggiore et al (2017) published two interesting and detailed studies that concluded that the risk of endometriosis-related complications during pregnancy is low. However, this study identified that among the study participants with endometriosis, a high incidence of placenta previa was detected as one of the most frequent endometriosis pregnancy outcomes (Ucella et al., 2017, Farland et al., 2019). These results are in line with previous research that has stressed the connection between endometriosis and placenta previa (Maggiore, 2017). In addition, researchers have found an increase in placenta previa. This is a condition that affects only women with deep infiltrative endometriosis. Pregnant women with endometriosis generally need to be reassured about the course of their pregnancy (Maggiore, 2017). In addition, current studies show that women with endometriosis have a higher incidence of emergency cesarean sections and lower vaginal delivery rates for both selective and non-selective purposes. Previously, a similar pattern of emergency cesarean section was observed in several studies, demonstrating the same fact (Exacoustos et al., 2016). Similarly, current studies have observed that obstetric complications such as placenta accreta and



postpartum bleeding are significantly associated with endometriosis.

On the other side, obstetrical problems, such as placenta accreta and postpartum haemorrhage, were found to be substantially correlated with endometriosis in the current study. Marcellin et al. (2015) established that the decidua of women with endometriosis can produce endometriosis-like lesions as it comes into contact with the fetal membranes in an *in-vitro* analysis. Furthermore, this finding may help in explaining the increased risk of placenta accreta and postpartum haemorrhage.

In addition, the study found that women with a history of endometriosis were at increased risk of developing gestational diabetes (GDM) or hypertensive pregnancy disorders. The finding was also published in a recent meta-analysis of 12 studies, which found that women with endometriosis had a 26% higher risk of GDM and hypertensive disease than women without endometriosis. (Perez-Lopez et al., 2018). Furthermore, the endometriosis disease stage has been linked to heterogeneity in the relationship between endometriosis and hypertensive disorders of pregnancy (Harada et al., 2016). However, the current study shows that the entire population is at increased risk of hypertensive pregnancy disorders, and the relationship is stronger in the second and subsequent pregnancies (Farland et al., 2019). In the current study, it was revealed that women with prior diagnosed endometriosis, on the other hand, had a higher rate of Preeclampsia in the subsequent pregnancies than women without endometriosis. According to Maggiore et al. (2017), a recent meta-analysis of 13 studies also suggests that women with endometriosis are at increased risk of preeclampsia (95%). Women who have previously had endometriosis are more likely to develop preeclampsia in subsequent pregnancies and should have enhanced maternal and fetal monitoring.

#### **Keep awareness on neonates**

Endometriosis causes complicated outcomes in neonates, similar to maternal complications. Women with a history of endometriosis were found to have a higher risk of stillbirth or intrauterine death, preterm birth, and low birth weight; all of which are common neonatal outcomes. According to a recent study, women with endometriosis are at increased risk of

preterm birth before 34 weeks of gestation (Farland et al., 2017). Glavind et al. (2017) reported in a recent study in the Aarhus Birth cohort that women with endometriosis are at increased risk of preterm birth and are at the highest risk of preterm birth. Endometriosis causes local and systemic inflammation in women (Mu et al., 2018). As Goldenberg (2008) states, inflammation is one mechanism thought to be increasing the risk of preterm birth in endometriosis groups, compared to controls. Leone et al. (2016) contend that endometriosis can cause growth restriction due to insufficient uterine contractility and improper placentation. Current studies confirm that pregnancy in women with endometriosis is highly associated with low birth weight compared to women without endometriosis. Moreover, the current study shows an increased risk of neonatal death associated with spontaneous abortion and ectopic pregnancy compared with women with no history of endometriosis. A recent meta-analysis discovered that women with endometriosis have a 75% percent higher risk of spontaneous abortion and a 21% and 29% percent higher risks of stillbirth, respectively (Lalani et al., 2018). Progesterone resistance in endometriosis patients is thought to cause deregulation of genes involved in embryo implantation, which could result in pregnancy loss (Vannuccini et al., 2016).

#### **CONCLUSION**

In conclusion, Women with endometriosis are at elevated risk for serious and important adverse maternal, foetal and neonatal outcomes. Our results indicate that women with a previous diagnosis of endometriosis are at a high risk of having placenta Previa, postpartum haemorrhage, and hypertension disorders as maternal outcomes. On the other hand stillbirth, preterm birth, and Low birth weight were identified as common neonatal outcomes of pregnancies diagnosed with endometriosis. These results inform women previously diagnosed with endometriosis of potential obstetric complications associated with endometriosis and provide prejudices or recommendations during the prenatal period. In addition, close monitoring by health professionals should be continued and prepared to overcome ongoing complications. The neonatal intensive care unit should be

notified and prepared prior to delivery to avoid unnecessary delays in managing neonatal complications. Finally, although this review has achieved the goal of providing an integration of existing literature on this important subject, the

exact mechanism by which endometriosis exacerbates pregnancy outcomes remains unclear.

## TABLES AND FIGURES

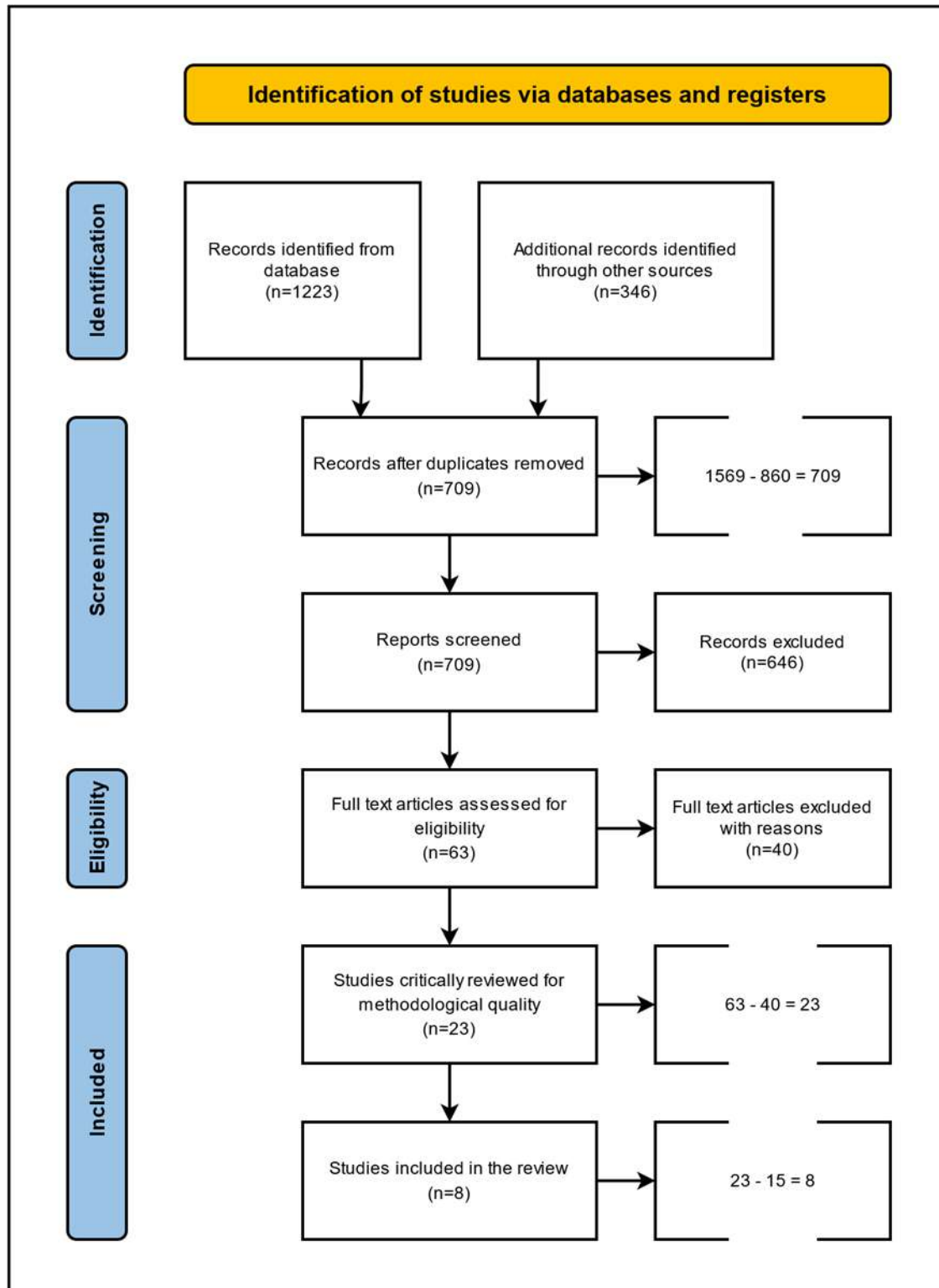


Figure 1. PRISMA flow chart of the article selection

Table 1. Key findings of the eight studies

Author	Study Design and Focus	Time frame and sample size	Key findings
<b>Smeuli et al (2017)</b>	<b>Retrospective Cohort Study.</b> To explore the obstetrical and neonatal outcomes of pregnancies complicated by endometriosis	2007 to 2014 Endometriosis group (135) Control group (61400)	<b><u>Maternal outcomes</u></b> Postpartum haemorrhage, emergency caesareans, placenta Previa. <b><u>Neonatal outcomes</u></b> no neonatal complications were noted
<b>Uccella et al (2019)</b>	<b>Retrospective Cohort Study.</b> To identify maternal and neonatal outcomes of endometriosis specified with the location of the disease	2011 to 2014. Endometriosis group (118) Control group (1680)	<b><u>Maternal outcomes</u></b> Placenta Previa. Hypertensive disorders. <b><u>Neonatal outcomes</u></b> preterm deliveries
<b>Pan et al (2017)</b>	<b>Nationwide population-based longitudinal study.</b> To explore the risk of gestational hypertension and preeclampsia in women with preceding endometriosis.	1998 to 2012 Endometriosis group (2578) Control group (10312)	<b><u>Maternal outcomes</u></b> preeclampsia Hypertensive disorders. <b><u>Neonatal outcomes</u></b> preterm deliveries Low birth weight
<b>Li et al (2017)</b>	<b>Retrospective Cohort Study.</b> To explore the obstetrical and neonatal outcomes of pregnancies complicated by endometriosis	2011 to 2013 Endometriosis group (98) Control group (300)	<b><u>Maternal outcomes</u></b> Gestational diabetes mellitus placenta Previa postpartum haemorrhage <b><u>Neonatal outcomes</u></b> preterm deliveries
<b>Farland et al (2019)</b>	<b>Prospective cohort study.</b> to explore the maternal and neonatal outcomes of pregnancies associated with endometriosis	1989 Endometriosis group (8875) Control group (196,722)	<b><u>Maternal outcomes</u></b> Gestational diabetes mellitus Hypertensive disorders <b><u>Neonatal outcomes</u></b> Still birth
<b>Conti et al (2015)</b>	<b>Multi-centric, observational, and cohort study.</b> To evaluate pregnancy, delivery, and neonatal outcomes in singleton primiparous versus multiparous women with or without endometriosis	Endometriosis group (316) Control group (1923)	<b><u>Maternal outcomes</u></b> Gestational diabetes mellitus <b><u>Neonatal outcomes</u></b> Preterm Delivery Low birth weight.
<b>Miura et al, (2019)</b>	<b>Case-control study.</b> Adverse effects of endometriosis on pregnancy	2010 to 2017 Endometriosis Group (316) Control group (1923)	<b><u>Maternal outcomes</u></b> Risk of placenta Previa Postpartum haemorrhage Gestational Diabetic mellitus <b><u>Neonatal outcomes</u></b> Preterm Delivery

<b>Berlac et al (2017)</b>	<b>National cohort study</b> to assess the obstetrical complications and neonatal outcomes in women with endometriosis	2007 to 2014 Endometriosis group (135) Control group (61,400)	<b><u>Maternal outcomes</u></b> placenta Previa postpartum haemorrhage <b><u>Neonatal outcomes</u></b> no neonatal complications were noted
----------------------------	--	---	---

## ACKNOWLEDGEMENT

Sincere gratitude to my research supervisor, Mr. Sunil de Silva for giving me the opportunity to do research and providing invaluable guidance through this dissertation. Nevertheless, extending heartfelt thanks to my dear Madam Mrs. Hiranga Wijedasa and Madam Mrs Chandrika Dasanayake for your encouragement and positivity and extremely grateful for your invaluable guidance.

## REFERENCES

- American Society for Reproductive Medicine (ASRM).(1996), Revised American Society for Reproductive Medicine classification of endometriosis, *Fertil Steril*, 67, 817-821
- Berlac, J.F., Hartwell, D., Skovlund, C.W., Langhoff-Roos, J. & Lidegaard, O. (2017), Endometriosis increases the risk of obstetrical and neonatal complications, *AOGS*, 96(6), 751-760.
- Brosens, I., Brosens, J. J., Fusi, L., Al-Sabbagh, M., Kuroda, K., & Benagiano, G. (2012). Risks of adverse pregnancy outcome in endometriosis. *Fertility and sterility*, 98(1), 30-35.
- Chen, I., Lalani, S., Xie, R. H., Shen, M., Singh, S. S., & Wen, S. W. (2018). Association between surgically diagnosed endometriosis and adverse pregnancy outcomes. *Fertility and sterility*, 109(1), 142-147.
- Conti, N., Cevenini, G., Vannuccini, S., Orlandini, C., Valensise, H., Gervasi, M.T., Ghezzi F., Di Tommaso, M., Severi, F.M. & Petraglia, F. (2014), Women with endometriosis at first pregnancy have an increased risk of adverse obstetric outcome, *J Matern Fetal Neonatal Med*, 28(15)
- Exacoustos, C., Lauriola, I., Lazzeri, L., De Felice, G., & Zupi, E. (2016). Complications during pregnancy and delivery in women with untreated rectovaginal deep infiltrating endometriosis. *Fertility and sterility*, 106(5), 1129-1135.
- Farland, L. V., Ai-ris, Y. C., Correia, K. F., Grodstein, F., Chavarro, J. E., Rich-Edwards, J., & Missmer, S. A. (2016). Who receives a medical evaluation for infertility in the United States?. *Fertility and sterility*, 105(5), 1274-1280.
- Farland, L. V., Prescott, J., Sasamoto, N., Tobias, D. K., Gaskins, A. J., Stuart, J. J., ... & Missmer, S. A. (2019). Endometriosis and risk of adverse pregnancy outcomes. *Obstetrics and gynecology*, 134(3), 527.
- Garcia-Velasco, J. A., Mahutte, N. G., Corona, J., Zúñiga, V., Gilés, J., Arici, A., & Pellicer, A. (2004). Removal of endometriomas before in vitro fertilization does not improve fertility outcomes: a matched, case-control study. *Fertility and Sterility*, 81(5), 1194-1197.
- Glavind, M. T., Forman, A., Arendt, L. H., Nielsen, K., & Henriksen, T. B. (2017). Endometriosis and pregnancy complications: a Danish cohort study. *Fertility and sterility*, 107(1), 160-166.
- Goldenberg, R. L., Culhane, J. F., Iams, J. D., & Romero, R. (2008). Epidemiology and causes of preterm birth. *The lancet*, 371(9606), 75-84.
- Lalani, S., Choudhry, A. J., Firth, B., Bacal, V., Walker, M., Wen, S. W., ... & Chen, I. (2018). Endometriosis and adverse maternal, fetal and neonatal outcomes, a systematic review and meta-analysis. *Human reproduction*, 33(10), 1854-1865.
- Li, H., Zhu, H. L., Chang, X. H., Li, Y., Wang, Y., Guan, J., & Cui, H. (2017). Effects of Previous Laparoscopic Surgical Diagnosis of

- Endometriosis on Pregnancy Outcomes, Chinese medical journal, 130(4), 428–433.
- Maggiore, U. L. R., Inversetti, A., Schimberni, M., Vigano, P., Giorgione, V., & Candiani, M. (2017). Obstetrical complications of endometriosis, particularly deep endometriosis. Fertility and sterility, 108(6), 895-912.
- Marcellin, L., Santulli, P., Gogusev, J., Lesaffre, C., Jacques, S., Chapron, C., ... & Méhats, C. (2015). Endometriosis also affects the decidua in contact with the fetal membranes during pregnancy. Human Reproduction, 30(2), 392-405.
- Miura, M., Ushida, T. & Imai, T. (2019) Adverse effects of endometriosis on pregnancy: a case-control study, BMC Pregnancy Childbirth, 373
- Mu, F., Harris, H. R., Rich-Edwards, J. W., Hankinson, S. E., Rimm, E. B., Spiegelman, D., & Missmer, S. A. (2018). A prospective study of inflammatory markers and risk of endometriosis. American journal of epidemiology, 187(3), 515-522.
- Oxholm, D., Breth Knudsen, U., Kryger-Baggesen, N., & Ravn, P. (2007). Postmenopausal endometriosis. Acta obstetrica et gynecologica Scandinavica, 86(10), 1158-1164.
- Ozkan, S., Murk, W., & Arici, A. (2008). Endometriosis and infertility: epidemiology and evidence-based treatments. Annals of the New York Academy of Sciences, 1127(1), 92-100.
- Pan, M. L., Chen, L. R., Tsao, H. M. & Chen, K. H. (2017), Risk of gestational hypertension-preeclampsia in women with preceding endometriosis: A nationwide population-based study, PLoS ONE, 12(7).
- Roshi, E., Burazeri, G., & Toci, E. INTRODUCTION TO EPIDEMIOLOGICAL STUDIES. Health Investigation: Analysis-Planning-Evaluation, 149.
- Shmueli, A., Salman, L., Hirsch, L., Ashwal, E., Hadar, E., Wiznitzer, A., Yogev, Y. & Aviram, A. (2017), Obstetrical and neonatal outcomes of pregnancies complicated by endometriosis, J Matern Fetal Neonatal Med, 32(5), 845-850.
- Szklo, M. (1998). Population-based cohort studies. Epidemiologic reviews, 20(1), 81-90.
- Uccella, S., Cromi, A., Casarin, J., Bogani, G., Pinelli, C., Serati, M., & Ghezzi, F. (2014). Laparoscopy for ureteral endometriosis: surgical details, long-term follow-up, and fertility outcomes. Fertility and Sterility, 102(1), 160-166.
- Vannuccini, S., Clifton, V. L., Fraser, I. S., Taylor, H. S., Critchley, H., Giudice, L. C., & Petraglia, F. (2016). Infertility and reproductive disorders: impact of hormonal and inflammatory mechanisms on pregnancy outcome. Human reproduction update, 22(1), 104-111
- Vannuccini, S., Clifton, V. L., Fraser, I. S., Taylor, H. S., Critchley, H., Giudice, L. C., & Petraglia, F. (2016). Infertility and reproductive disorders: impact of hormonal and inflammatory mechanisms on pregnancy outcome. Human reproduction update, 22(1), 104-115.



## Correlates of Severe Pain: Descriptive Study among Patients with Cancer in Sri Lanka

Edirisinghe NP<sup>\*1</sup>, Makuloluwa PTR<sup>2</sup>, Amarasekara AATD<sup>3</sup>, Goonewardena CSE<sup>4</sup>

<sup>1</sup>Faculty of Graduates Studies, University of Sri Jayewardenepura, Sri Lanka, Department of Nursing, Faculty of Humanities and Science, Sri Lanka Institute of Information Technology, Malabe, Sri Lanka

<sup>2</sup>Department of Clinical Sciences, Faculty of Medicine, General Sir John Kotelawala Defence University, Sri Lanka

<sup>3</sup>Department of Nursing and Midwifery, Faculty of Allied Health Sciences, University of Sri Jayewardenepura, Sri Lanka

<sup>4</sup>Department of Community Medicine, Faculty of Medical Sciences, University of Sri Jayewardenepura, Sri Lanka, Cancer Research Center, Faculty of Medical Sciences, University of Sri Jayewardenepura, Sri Lanka

### ARTICLE INFO

#### Article History:

Received Date: 01 July 2022

Accepted Date: 15 September 2022

#### Keywords:

Cancer pain; associated factors; correlates; Sri Lanka

#### Citation:

Edirisinghe NP, Makuloluwa PTR, Amarasekara AATD, Goonewardena CSE. (2022). *Correlates of Severe Pain: Descriptive Study among Patients with Cancer in Sri Lanka*. Proceedings of SLIIT International Conference on Advancements in Sciences and Humanities, (11) October, Colombo, 275 - 279.

### ABSTRACT

The most prevalent and unpleasant symptom that cancer patients encounter is pain. Pain is a highly subjective feeling resulting from the intricate interaction of bio-psycho-social aspects of the individual. The study aims to describe the correlates of severe pain in cancer patients in Sri Lanka. Methods: The descriptive study involved 384 cancer patients from Apeksha Hospital, Maharagama. Patients over 18 years who experienced cancer pain for three months or more, related to the primary lesion, secondary lesions, radiation, or chemotherapy were eligible. Patients whose pain is due to a non-cancerous source, triggered under three months of the assessment, and those who are too frail or disoriented with evidence of brain metastases are either unable or unwilling to give informed consent were excluded. The patients fulfilling inclusion criteria were recruited using the consecutive sampling method. The correlates of severe pain were determined using logistic regression. A validated Sinhala version of the Short Form Brief Pain Inventory and a pre-tested socio-demographic questionnaire was used to collect data. The correlates of severe pain were determined

\*Edirisinghe, nirossha.e@slit.lk

using logistic regression. Statistically significant correlation was shown between severe pain and 'male gender', (AOR=1.723;  $p=0.035$ ); 'being in marriage' (AOR =1.947;  $p=0.026$ ); 'patients with no perceived family commitments' (AOR=1.8;  $p=0.013$ ) and pain of three months or more duration (AOR = 1.76;  $p=0.021$ ). In conclusion it is discovered that the severe pain is positively correlated with males, 'being in a marriage,' 'no perceived family commitments, and in pain for over a three months duration.

## 1. INTRODUCTION

Pain is an enormous global health problem, growing day by day. It is a multifaceted and complicated experience that encompasses physical, social, and psychological dimensions. 'Globocan' report on Sri Lanka states that the incidence of cancer patients reported in 2018 was 23,530, while the number of cancer deaths was 14,013 with a five-year prevalence of 56,054 (Bray et al, 2018).

Identification of correlates for severe pain in patients with cancer would be helpful for earlier and better management of cancer-related pain. Pain may be more widespread in some subpopulations of cancer survivors, such as those diagnosed with breast and lung cancers related to the stage of cancer or the type of surgery done (Mayer et al, 2011; Forsythe et al, 2013). The severity and prevalence of chronic pain among cancer survivors also vary by racial group (e.g., blacks report more severe pain than whites) and gender (i.e., females experience more pain than males) (Green et al, 2011).

Moreover, younger age, longer duration of the disease, cancers of stage I-III, and specific treatment modalities like chemotherapy and radiotherapy have been found to correlate with the severity of pain (Beaek et al, 2021; van den Beuken-van Everdingen et al, 2016). The meta-analysis by Zaza and Babe showed that pain and psycho-social well-being are correlated (Zaza & Baine, 2002).

Apart from the recent evidence in the global literature on associated factors of cancer pain, it failed to trace data from similar studies done locally. Therefore, it is presumed that a proper understanding of this entity will have the potential to positively impact the preventive and therapeutic measures of cancer pain. This study primarily aims to describe the correlates

of severe pain among cancer patients in Sri Lanka.

## 2. METHODS AND MATERIALS

A descriptive cross-sectional study was carried out. The Ethics Review Committee of the Faculty of Medical Sciences, University of Sri Jayewardenepura, Sri Lanka, granted the ethical approval (App no: 28/17).

### 2.1 Setting and Subject Recruitment

The target population consists of patients, who are over the age of 18 years, diagnosed with cancer pain scores of  $>3$  on the Numerical Rating Scale (NRS) that lasted at least three months or more due to the primary or secondary lesions, radiotherapy, or chemotherapy were included. The pain of non-cancerous origin lasted for less than three months, and patients who were frail/mentally unfit or disoriented and were unable or unwilling to provide informed permission were eliminated. The patients fulfilling inclusion criteria were recruited using the consecutive sampling method.

### 2.2 Study instruments

The Sinhala translated and validated Short Form Brief Pain Inventory (SF BPI) (Edirisinghe et al, 2021) and pre-tested questionnaire to assess associated factors for severe pain were used as an interviewer-administered questionnaire in this study.

### 2.3 Data collection

The study's eligibility criteria were verified by reviewing the patients' medical records and speaking with them. Prior to collecting data, informed written consent was obtained from the participants of the research. Data was collected by the principal investigator and a trained data collector during face-to-face interviews using the abovementioned instruments.

### 2.4 Statistical Analysis

The data analysis was performed using IBM SPSS Statistics version 23. The cut-off values for mild, moderate, and severe pain on the NRS scale were decided based on the widely

accepted findings from the study conducted by Serlin et al. (Serlin et al., 1995).

For bivariate analysis, the dependent variable; the 'worst pain,' was categorized into two: mild to moderate pain (NRS < 7 for 'worst pain') and severe pain (NRS > 7 for 'worst pain'). The independent variables chosen for correlation were combined into two groups based on the evidence from literature and expert opinion. To summarize the demographic and clinical characteristics of the patients, descriptive analysis was performed. Categorical variables such as gender, marital status, education, religion, and clinical features were compared using Chi-square and Fisher's exact tests. The correlates of severe pain were determined using logistic regression. The multivariate analysis considered only variables with a p-value of less than 0.1 as statistically significant in bivariate analysis. P values less than 0.05 were deemed statistically significant.

### 3. RESULTS

The mean age was 56.17, and SD  $\pm 11.83$  ranged from 19–88 years, with a female: male ratio of 1.5:1.0 among the study participants. The majority were Sinhalese accounting for 86.7% (n = 333) and the proportion of Tamils were 8.6% (n = 33). The study population represented four main religions in Sri Lanka, with the majority being Buddhists (n = 285; 74.2%). Nearly 80% of study participants (n = 306) were married and 7% (n = 27) were unmarried while 9.6% (n=37) were widowed.

As per the bivariate analysis, the male participants were 2.01 times more likely to experience severe pain than females (OR= 2.01; 95% CI=1.235-3.289, p=0.005). Age, ethnicity, religion, and marital status did not significantly correlate with severe cancer pain. There was no statistically significant association between

severe pain and assessed socio-economic characteristics, the patient's highest educational attainment (p=0.235), and the current status of employment (p= 0.746). The study participants who did not have family commitments were 1.73 times more likely to experience severe cancer pain than those with family commitments (OR = 1.73; 95% CI=1.098 - 2.744, p=0.018). Statistically, a significant association was not shown between the experience of severe pain and the availability of a caregiver (p=0.546) or type of the family (p=0.7). The participants who experienced the cancer pain over three months were 1.72 times more likely to develop severe pain than those who had pain for less than three months (OR= 1.72; 95% CI 1.097 - 2.727, p=0.018). No statistically significant association was found between severe pain and the type of cancer, time since the diagnosis of cancer (p=0.103), and the presence of co-morbidities (p=0.15). No statistically significant association was found with active cancer treatments (p=0.228) or previous surgery (p=0.904).

The omnibus testing of model coefficients indicated a final model with a chi-square value of 22.1 that was statistically significant at the p<0.001 level. The final model explained between 5.6% (Cox and Snell R<sup>2</sup>) and 8.1% (Nagelkerke R<sup>2</sup>) of the variance in severe pain. All variables included in the multivariate analysis were retained as significant correlates of severe pain in the final model after adjusting for confounding effects. Males (AOR=1.723, 95% CI = 1.03 – 2.86), who were married (AOR= 1.947, 95% CI= 1.082-3.504), having a pain for more than three months (AOR=1.76; 95% CI = 1.09 – 2.84), with no family commitments (AOR= 1.84; 95% CI = 1.136-2.993) showed a statistically significant correlation with severe pain as shown in Table 1.

Table 1: Correlates of severe pain experienced following Multivariate Analysis

Factor	B	SE (B)	Wald	P-value	Adjusted OR Exp (B)	95% CI for Exp( B)
Duration of cancer pain for more than three months	0.567	0.245	5.368	0.021	1.763	1.091-2.848
Absence of family commitments	0.612	0.247	6.131	0.013	1.844	1.136-2.993
Being in marriage	0.666	0.300	1.940	0.026	1.947	1.082-3.504
Male gender	0.544	0.259	4.423	0.035	1.723	1.038-2.860



Note: OR = odds ratio. CI = confidence interval, B = unstandardized regression weight,

#### 4. DISCUSSION

This descriptive cross-sectional study described the correlates of severe pain among cancer patients. At the time of designing the study, research with similar objectives had not been conducted and published locally.

In the current study, associated factors of severe pain are described under four main areas: demographic and socioeconomic factors, current health status-related factors, family-related factors, and cancer treatment-related factors. The gender being male emerged as a significant correlate of severe pain in our study; however, a more recent study by Broemer et al. (Broemer et al., 2021) and Shega et al. (Shega et al., 2014) find a significant association between moderate to severe cancer pain with females, which is not in line with the findings of the present study. Further, Broemer et al. find that younger patients who are less educated and unemployed experience more severe pain frequently (Broemer et al., 2021). Similarly, Shega et al. (Shega et al., 2014) report that younger patients (<55 years) whose school education is limited to ten years or less, experience a higher pain severity than those who have more than ten years of education, which is not a significant finding in the present study.

Current health-related characteristics were taken into special consideration as predictors of severe pain. However, only the participants with more than three months of pain are more likely to experience severe pain. This observation may reflect the extent of the underlying disease and inadequate measures taken to control pain. According to Broemer et al. (Broemer et al., 2021), the highest pain levels are found in patients with cancers in the head and neck area. Similarly, it is observed that those with oro-facial cancers have severe pain, two times higher than others in the present study; however not statistically significant. Similarly, Isaac et al. (Isaac et al., 2012) report that compared to individuals with other cancers, those with cancers in the head, neck, stomach, or thorax are more prone to experience severe pain. In bivariate analysis, none of the cancer treatment-related characteristics emerge as significant predictors of severe pain, although participants frequently complain of pain while on cancer treatments.

Finally, the present study discovers a statistically significant association between severe pain and patients who are not perceived with family commitments. However, this aspect has not been reported in previous studies. Moreover, a significant positive correlation between severe pain and those in marriage is found; in contrast to the literature which has reported an insignificant association between marital status and the extent of pain (Parás-Bravo et al. 2017).

The study includes only the associated factors of cancer-related pain, which are measurable in the context of the study and it is identified as a limitation of the study. Therefore, the final logistic regression model explains 5.6% to 8.1% of the variance in having severe pain, suggesting that nearly 9/10 of the variance is left unexplained.

In conclusion, a significant positive correlation is shown between severe pain and males, who are married 'not having family commitments, and pain for over three months duration. Proactive measures are recommended to disseminate findings and raise awareness among the members of pain teams in Sri Lanka with a view to improve patient outcomes. Potential exists for further studies to shed light on the field.

#### REFERENCES

1. Bray F, Ferlay J, Soerjomataram I, Siegel RL, Torre LA, Jemal A (2018). Global cancer statistics 2018: GLOBOCAN estimates incidence and mortality worldwide for 36 cancers in 185 countries. *CA: A Cancer Journal for Clinicians*. 68(6):394–424.
10. Broemer, L., Hinz, A., Koch, U., & Mehnert-Theuerkauf, A. (2021). Prevalence and Severity of Pain in Cancer Patients in Germany. *Frontiers in Pain Research*, 2, 703165.
11. Shega, J. W., Tiedt, A. D., Grant, K., & Dale, W. (2014). Pain measurement in the National Social Life, Health, and Aging Project: presence, intensity, and location. *The journals of gerontology. Series B, Psychological sciences and social sciences*, 69 Suppl 2(Suppl 2), S191–S197.
12. Isaac, T, Stuver, S. O., Davis, R. B., Block, S, Weeks, J. C, Berry, D. L, Weingart, S.N (2012).

Incidence of severe pain in newly diagnosed ambulatory patients with stage IV cancer. *Pain Research and Management*. 17: 347-352.

13. Parás-Bravo, Paula et al. (2017). "Association among the presence of cancer pain, inadequate pain control, and psychotropic drug use." *PloS one* vol. 12,6 e0178742. , doi:10.1371/journal.pone.0178742

2. Mayer DK, Travers D, Wyss A, Leak A, Waller A. (2011) Why do patients with cancer visit emergency departments? Results of a 2008 population study in North Carolina. *J Clin Oncol*; 29(19):2683–8.

3. Forsythe LP, Alfano CM, George SM, McTiernan A, Baumgartner KB, Bernstein L, et al. (2013). Pain in long-term breast cancer survivors: the role of body mass index, physical activity, and sedentary behavior. *Breast Cancer Res Treat*;137(2):617–30.

4. Green CR, Hart-Johnson T, Loeffler DR. (2011). Cancer-related chronic pain: examining the quality of life in diverse cancer survivors. *Cancer*;117(9):1994–2003

5. Baek SK, Shin SW, Koh S-J, Kim JH, Kim HJ, Shim BY, et al. (2021) Significance of descriptive

symptoms and signs and clinical parameters as predictors of neuropathic cancer pain. *PLoS ONE* 16(8): e0252781.

6. van den Beuken-van Everdingen, M. H. J., Hochstenbach, L. M. J., Joosten, E. A. J., Tjan-Heijnen, V. C. G., & Janssen, D. J. A. (2016). Update on Prevalence of Pain in Patients With Cancer: Systematic Review and Meta-Analysis. *Journal of Pain and Symptom Management*, 51(6), 1070-1090.e9.

7. Zaza, C., & Baine, N. (2002). Cancer Pain and Psycho-social Factors: A Critical Review of the Literature. 24(5), 17.

8. Edirisinghe, N. P., Makuloluwa, T. R., Amarasekara, T. D., & Goonewardena, C. S. E. (2021). "Evaluating Psychometric Properties of the Short Form Brief Pain Inventory Sinhala Version (SF BPI-Sin) among Sinhala Speaking Patients with Cancer Pain in Sri Lanka." *BMC Psychology* 9, no. 1: 34.

9. Serlin, R. C., Mendoza, T. R., Nakamura, Y., Edwards, K. R., & Cleeland, C. S. (1995). When is cancer pain mild, moderate or severe? Grading pain severity by its interference with function: *Pain*, 61(2), 277–284.



## Satisfaction Level and Quality of Life of patients Living with Split-Thickness Skin Graft, Following a Burn Injury in Burns Unit of the National Hospital, Colombo, Sri Lanka

Sirini Chamika Rajaguru <sup>\*1</sup>, Ruwan Thushara Gunawardana<sup>2</sup>

<sup>1</sup>BScN, RN, National Hospital, Colombo, Sri Lanka

<sup>2</sup>RN, National Hospital, Colombo, Sri Lanka

\*Sirini, srresirini2@gmail.com

### ARTICLE INFO

#### Article History:

Received Date: 01 July 2022

Accepted Date: 15 September 2022

#### Keywords:

QOL; Split Thickness Skin Graft; Short Form health survey 36

#### Citation:

Sirini Chamika Rajaguru, Ruwan Thushara Gunawardana. (2022). *Satisfaction Level and Quality of Life of patients Living with Split-Thickness Skin Graft, Following a Burn Injury in Burns Unit of the National Hospital, Colombo, Sri Lanka*. Proceedings of SLIIT International Conference on Advancements in Sciences and Humanities, (11) October, Colombo, 280 - 284.

### ABSTRACT

Burn is one form of traumatic injury and also a global public health problem. A high prevalence of burn injury rate is reported in low and middle-income countries and African and south-east Asian countries. The study aimed to describe the satisfaction and quality of life of patients with split-thickness skin grafts. A mixed method was used to conduct the study and the data were collected from post-split thickness skin graft patients, who participated in the Burn Clinic in the National Hospital, Sri Lanka. A descriptive cross-sectional research design and a simple random sample (n=109) of burn victims was selected to conduct the quantitative survey. The qualitative phase was conducted through in-depth interviews and using a purposive sample. Data were analyzed by using SPSS Version 20 and the thematic analysis method. Many of the burn victims' age ranges were 18-24 years (24.8%). The majority 61.5% were married. Each sub-domains of the SF36 is divided into physical and mental health According to the chi-square test. There was a positive association between physical health and mental health (0.001). Assessed mean value of the SF36 Scale by used total sum of the questionnaire. It called "Average Mean" of the study (Mean=54.29; High QOL >54.29; Low QOL< 54.29). Finally, the quality of life was measured by using that average mean results of that, the post -split-thickness skin graft

patients had high scores of quality of life 57 (52.3%, Mean > 54.29). Next thematic analysis in the qualitative phase identified three themes. They are: 'satisfied with 'new skin', 'living with split-thickness skin grafts' and 'are willing to participate in future activities'. Also, the qualitative results supported the quantitative findings. The conclusion of the findings revealed that quality of life was compromised in the majority of post-burn patients. But after facing split thickness graft surgery most victims reported a high quality of life and high satisfaction level than others.

## INTRODUCTION

Burn is one form of traumatic injury caused by thermal, electrical, chemical, radiation agents and contact or friction. It is a global public health problem, accounting for an estimated 180,000 deaths annually (WHO, 2018). Skin grafting is a common surgical intervention for these patients. It was generally classified as split-thickness or full-thickness grafts. When a graft includes only a portion of the dermis, it is called a split-thickness skin graft (Valencia, Falabella and Eaglstein., 2000). Many qualitative and quantitative studies were found in this area of research. Some qualitative studies address body image, returning to work after a burn, and scars in general (Lawrence et al., 2012). Some qualitative literatures, describe the experience of having a split-thickness skin grafting surgery and the impact of living with a split-thickness skin graft (STSG). The study aimed to explore the experience and assess the quality of life of patients living with split-thickness skin grafts, following a burn injury in a selected burns unit. The most recent study found that many patients faced unpleasant side effects and symptoms like poor image, lack of elasticity and altered sensation after getting a burn & which directly affected the patient's quality of life (Burnett, 2013). Burn patient satisfaction level assessment is more important, but a limited research addresses this challenge. Many studies have introduced more reliable quality of life scales related to a patient with burn which identify the impact of burn scarring on health-related quality of life (Simon et al., 2019).

## MATERIALS AND METHODS

A mixed method was chosen as the design of this research. This part of the study generated quantitative results by using a descriptive survey and the qualitative part was conducted by using an in-depth interview. One hundred nineteen who underwent post-split thickness skin graft in 2 months to 1 year period agreed to participate in burns clinic at National hospital in Sri Lanka. The study was conducted during six months period. The study combined a quantitative survey assessing patient's personal characteristics and quality of life about new skin (n=109). Simple random sampling was used, it was analyzed using "The Pearson Chi-Square test" and a qualitative focus group study (n=7; sample was selected purposefully, which analyzed using thematic analysis). Burnt patient's life experience and satisfaction living with split thickness skin graft and experience of surviving from burn were researched in this part. SF 36 and self-administered questionnaires were used to gather data. This study was approved by the Research Ethics Board at the University of KIU and the National Hospital of Sri Lanka.

Results: Participants of the quantitative study were 109 individuals (56 women and 53 men) who completed the questionnaire appropriately. The subjects had a mean age of 37.8 years (SD: 1.601). It is emphasized that 44(40.4%) had incomplete secondary education (nursery to grade 10 education). The majority of burn patients were married (62.4%). A lot of self-employed persons with face burn injuries was 29 (26.6%). According to this study, accidental burn patients displayed nearly fifty per cent of the total was 48 (44%) (Table ii ).

Table.ii. Demographic data

	Demographical data	Percentage
Gender	Female	51.4%
Age	18-24years	24.8%
Education level	Nursery to grade 10	40.4%
Civil status	Married	62.4%
Occupation	Self employed	26.6%
History of injury	Accidental	44.0%

Table.iii.Chi-square test and ANNOVA

Factors	Chi-square result	ANOVA
Age*Quality of life	0.248	0.735
Gender* Quality of life	0.400	--
Marital status* Quality of life	0.604	0.776
Education level*Quality of life	0.521	0.640
Occupation*Quality of life	0.370	0.314
History*Quality of life	0.455	0.627

Results of that age between 45yrs to 64 years represented a higher quality of life than the other ages According to (Figure-I) and (Figure II), females were reported to have a higher quality of life(>30%) than the males but it has not reached the upper half level. Moreover, married persons had high QOL than the comparison of Low QOL (Figure-III). However, the education level, history of injury, and type of occupation had no specific differences from each other. Finally, quality of life was measured using the average mean (Mean=54.29). So, post-split-thickness skin graft patients had high scores of quality of life 57 (52.3%, Mean> 54.29) than their previous life as survivors of burn injury.

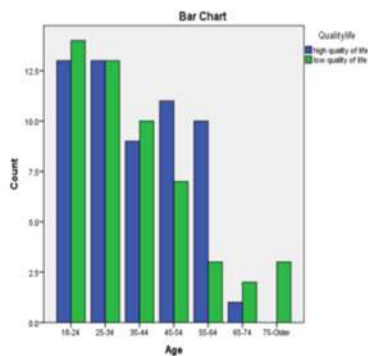


Figure-I-Age vs QOL

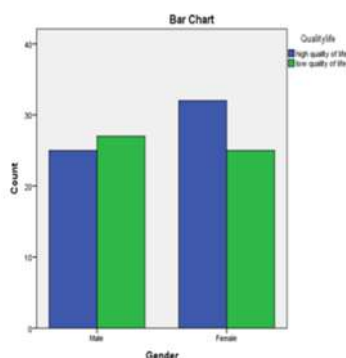


Figure-II- Gender vs QOL

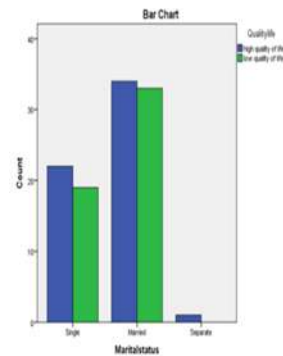


Figure-III- Marital status vs QOL

## RESULT OF THE QUALITATIVE SURVEY

Burn is an unforgettable painful memory of these patients. Some suicidal patients dislike remembering the incident. However, others thanked their gods for recovering them after this type of a severe injury. One person explained that life was saved as a miracle:

“... I have burn 3000W electrocution when cut down the tree. ...During hospitalized my village members thought... I am death. However still I impressed my life saving and it's a miracles. I think the Load Buddha's save my life...(P4)

Otherwise, participants with over 10% of burns in their bodies surface were typically on sedating analgesics for acute injuries, and therefore much of the details regarding the STSG were reported to have understood only after the procedure. These participants expressed confusion, fatigue, shock or heavy sedation prior to their STSG, and therefore any communication prior to the procedure was forgotten or unclear to them (Burnett., 2015). There was a significantly different reaction that may occur from the participant. Some were shocked after seeing the new outcome. The new skin was very ugly, dark color, altered sensation, and keloid scar appeared. According to that they were wearing long sleeves, refused to go to crowded areas and tried to isolate themselves inside of home because, they were conscious of others' thoughts about their skin. Therefore, assessing satisfaction about a new skin was better. A young interviewer in this study expressed his own feeling about new skin:

“ My skin appearance looks like” DEVIL OF GARA”. So I don't like to participate in any family events. Because I know that my face looks unpleasant to others.

Living with split-thickness skin graft is a new experience and some were struggling to live with their new skin. In fact, all the participants in this research retained at least one physical

symptom. All seven members explained that itching was a usual side effect among others. Due to this reason, some new wounds have appeared over the grafted skin. One such interviewer explained the itching on his word:

"My hateful feeling is... itching.... I cannot put any clothes on my body due to this reason... If I wear some little rough shirt, it starts to itch. ...Several times it feels like someone is cutting my body using sharp knife..."(P7)

The main reason of movement limitation is the loss of elasticity of the skin. In case of this change of daily routine and dependence on others gradually impact the one's personality. Therefore, family aid services and counseling are essential. All seven members in this study stated that they are willing to participate in the future clinical trials due to their improved appearance. The majority of participants wished to reduce symptoms by using some external applications, injections and wearing pressure garments because they refused face surgeries. Some were accepting to participate future research trails with concern risk, trustworthiness and outcomes

## DISCUSSION

Patient demo-graphical data and quality of life were assessed by using a quantitative and qualitative approach. According to the results of the quantitative survey, most burn victims were females (56%) who sustained accidental (48%), suicidal (42%) and homicidal effects. Major burn cases were reported in the age groups of 18-24 and 25-34 (24.8% and 23.9%). It means that mainly the young generation may be affected to burn injuries from their workplaces or own residences as they are risk takers who try to do unusual activities without concerning their protection. Furthermore, the perception of QoL has no statistically significant difference between the means of different levels of the demographical findings ( $p > 0.05$ ). But the main two domains of SF36 physical health and mental health had a positive association. Utah Health Sciences Center published in their research, assessed the association between burn risk and socio-economic economic status. All the risk factors were placed into categories pertaining to ethnicity, income, family structure and education, occupations and general socio-economic status (Edelman., 2007) but, in this study comparatively there was no association

between demographical characteristics and the quality of life. Lastly, it was identified that there is a positive association between physical and mental domains which means all physical conditions directly impact someone's mentality. According to quality level with demographical data, the majority of female 45-64year age group had a high quality of life, but lower quality of life was seen in the age groups of 25-34years. It was found that the females' quality of life was higher than the males, but an American study observed that the QoL of women is poorer than men and certain symptoms and morbidity independently influence the domains of SF-36 in this population (Sabbah et al., 2003). A Patient's experience of a burn was more important and unforgettable in their lives. It directly impacted a patient's mind. (Williams et al., 2003). All of the participants in this study described at least one physical symptom they found bothersome in the split-thicknesses skin grafts regardless of the time since their procedure. Some recent studies were done to assess the patient mentality association with physical symptoms (Burnett et al., 2014). Moreover, patient's satisfaction level is related to the final outcome of the split thickness skin. Other than that the majority of the participant from this study was willing to participate in academic research. Overly, Patient experience and survey data are now widely used to measure the quality of health services. This study may help to identify burn patients' problems and what they need. Finally, the study observed whether the patients who faced split thickness skin graft surgery have a productive quality of life compared to the conditions before the surgery.

## CONCLUSION

The findings of this study contributes to knowledge about the burn injury, satisfaction with skin grafts, real experiences related to skin grafts and also identifies the characteristics which impact burn- patient's quality of life. In general, findings identified factors that reduce patients' quality of life. So, some community groups offer a range of activities which may assist in having social support to improve the quality of life. In conclusion, if patients prepare for surgery, major requirements which need to be fulfilled are the need of counseling, education on the outcome of the surgery and health education as they may assist in reducing

loneliness, negativism and increasing social connections for split thickness skin graft.

## ACKNOWLEDGEMENT

Our warm gratitude is bestowed on the directors and staff of the Colombo National hospital of Sri Lanka and my supervisory committee for their friendly support. And I would like to thank all the patients and their family members who participated in this research.

## REFERENCES

- Burnett, L. N., Carr, E., Tapp, D., Bouchal, S. R., Horsch, J. D., Biernaskie, J., & Gabriel, V. (2014). Patient experiences living with split thickness skin grafts. *Burns*, 40(6), 1097-1105.
- Edelman, L.S.(2007). Social and economic factors associated with the risk of burn injury. *Burns*, 33(8), 958-965.
- Sabbah, I., Drouby, N., Sabbah, S., Retel-Rude, N. & Mercier, M.(2003). Quality of life in rural and urban populations in Lebanon using SF-36 health survey. *Health and quality of life outcomes*, 1(1), 1-14.
- Simons, M., Price, N., Kimble, R. & Tyack, Z.(2016). Patient experiences of burn scars in adults and children and development of a health-related quality of life conceptual model: a qualitative study. *Burns*, 42(3), 620-632.
- Valencia, I.C., Falabella, A.F. & Eaglstein, W.H.(2000). Skin grafting. *Dermatologic clinics*, 18(3), 521-532.
- Williams, N.R., Davey, M. & Klock-Powell, K.(2003). Rising from the ashes: stories of recovery, adaptation and resiliency in burn survivors. *Social Work in Health Care*, 36(4), 53-77.
- World Health Organization(2018). *Burns*, World health organization.





## Case Study on the Patient with Ovarian Cancer: Palliative Nursing Management

Nirmala Alahakoon <sup>1\*</sup>, Lalitha Meegoda<sup>2</sup>

<sup>1</sup>Department of Nursing and Midwifery, Faculty of Allied Health Sciences, University of Sri Jayewardenepura, Sri Lanka

<sup>2</sup>Department of Nursing and Midwifery, Faculty of Allied Health Sciences, University of Sri Jayewardenepura, Sri Lanka

### ARTICLE INFO

#### Article History:

Received Date: 01 July 2022

Accepted Date: 15 September 2022

#### Keywords:

Ovarian cancers, Anxiety, Depression, Spiritual needs

#### Citation:

Nirmala Alahakoon, Lalitha Meegoda. (2022). *Case Study on the Patient with Ovarian Cancer: Palliative Nursing Management*. Proceedings of SLIIT International Conference on Advancements in Sciences and Humanities, (11) October, Colombo, 285 - 289.

### ABSTRACT

This case study is on a 59 year old female patient who was admitted to the medical ward due to severe abdominal pain. Four years ago, she was diagnosed with Carcinoma in the Ovary. She underwent – Total abdominal hysterectomy (TAH), bilateral Salpingo-oophorectomy (BSO) and Omentectomy. Chemotherapy and radiotherapy treatments followed the surgery. She had been diagnosed with Diabetes Mellitus & Hypertension too.

This patient mainly showed significant pain, abdominal distension, and gastrointestinal dysfunction. Apart from the other physical symptoms, she showed psychological and spiritual problems too. During the assessment her eyes were full of tears. She was highly worried about her health condition & worried about her elder son who is unable come the see her because he lives abroad. The sensitive aspect of this patient was her psychological status. More attention must be paid to alleviate anxiety and depression.

The holistic approach is very important in caring for a patient on palliative care. There was a problem found with her caregiver at home. Because she lives with her husband and her younger son is at home. A Caregiver plays a major role in caring for this palliative patient. Therefore, it is essential to assess the caregiver condition for preventing caregiver burden.

In providing nursing care for this patient to relieve pain and other physical problems they

\*Nirmala, nirmalaalahakoon185@gmail.com



used pharmacological and non-pharmacological interventions. Though her pain & other physical problems were relieved by the day her psychological status was deteriorating. This may have caused depression and anxiety. It is suggested to take care of the patient's mental health and to implement appropriate psychological strategies, nursing interventions, and precautionary measures to minimize the level of psychological distress and to increase patient's quality of life.

## INTRODUCTION

The ovaries are unique organ that organizes menstruation, hormonal balance, bone metabolism and fertilization. One of the cancers in adult women with the worst prognosis is ovarian cancer (Furuya, 2012). Ovarian cancers are the second most common gynecological malignancy in developed countries (Kurnit et al., 2020).

Pathologic studies have revealed that ovarian cancers depending on histologic types. The most common histological subtypes of epithelial ovarian carcinomas are serous, mucinous, endometrioid and clear cell types (Furuya, 2012). Genetic factors, increasing age, the use of postmenopausal hormone therapy, infertility, and nulliparity are several factors that can increase the risk of developing ovarian cancer (Ebell et al., 2016). A higher risk was associated with infertility and a late age menopause (Booth et al., 1989). Some studies have identified obesity as a possible risk factor for the development of postmenopausal ovarian cancer (Matulonis et al., 2022).

Ovarian cancer is usually diagnosed in older women (Ebell et al., 2016). The signs & symptoms of ovarian cancer are non-specific and can be attributed to other potential disease processes. The clinical presentation of the disease includes abdominal bloating, pelvic or abdominal pain, gastrointestinal dysfunction (such as constipation, bowel obstructions, diarrhea, nausea, vomiting and gastrointestinal reflux), and fatigue. Extensive intra-abdominal malignancy with ascites, which results in diaphragmatic pressure, pleural effusions, can cause respiratory difficulties (Matulonis et al., 2022).

Diagnostic evaluation includes physical examination of the patient, which consists of pelvic examination and rectovaginal examination, in addition to radiographic

imaging (Trans vaginal ultrasonography, abdominal ultrasonography, CT scan). Ovarian cancer may also be detected using blood tests in combination with other diagnostic procedures (Matulonis et al., 2022). Early identification of the disease and managing the disease condition is very important to minimize the progression of the disease. Management of ovarian cancer includes surgery, chemotherapy, radiotherapy and Immunotherapy. Cytoreductive surgery and platinum-based chemotherapy are the standard therapies for newly diagnosed cancer. Surgery alone may be effective in the treatment of early disease. Advanced disease may require complex management and therapy (Rooth, 2013).

Nurses have a huge set of responsibilities for handling a patient with cancer. The holistic approach is essential in caring a patient on palliative care which includes assessing and the management of the physical, psychological, and social and spiritual needs of the patient and their families. The goal of palliative care is to provide relief from pain and other physical symptoms, psychological and spiritual care and maximize the quality of life.

Patients should also be routinely screened for psychological distress, such as depression, anxiety, fear of recurrence or change in body image. Mindfulness and active participation in care may help patients manage feelings of uncertainty.

## CASE PRESENTATION

This patient, a 59 year old female from the Sinhala community was admitted to the medical ward due to the severe abdominal pain. 4 years ago she was diagnosed of Carcinoma in Ovary. Her present condition is deteriorating and liver metastasis present. Laparotomy Total abdominal hysterectomy (TAH), bilateral salpingo-oophorectomy (BSO) and Omentectomy surgeries have been carried out on her. She has undergone chemotherapy and radiotherapy treatment.

Along with this condition she was also has diagnosed with Diabetes mellitus & Hypertension. This patient has no allergies for food, drugs and plasters. She has a family history of cancer. Her 87 year old mother was recently diagnosed with carcinoma in breast.

Regarding the patient's Socio- economic status; she is a housewife and a mother of two

children. She was educated up to O/L. Her husband is a businessman. Her elder son is in abroad, and the younger son is an accountant. She lives with her husband and younger son in their own single story house. Her husband has hypertension. Their monthly income is satisfactory to covers their expenses. Her financial & family support are good. She is a non – smoker, a non- alcoholic and has no special health habits. She can do her daily activities of walking, bathing, and dressing as functional activities with the help of assistance.

According to the physical assessment of the patient, the present complaints were severe pain, and the pain score was 8/10. The patient complained about abdominal distention, and difficulty in swallowing nausea and vomiting. The patient had constipation for 2 days. During the assessment it was identified that she had shortness of breath (SOB), dry mouth, and leg edema. Catheterizations and cannulization were done for this patient. At the assessment vital signs were PR:72 min-1, BP:110/85 Hgmm, RR: 18 min-1, SPO2: 98%, Body Temperature – 98.4 F. Patient takes only small frequent liquid feeding because of the difficulty in swallowing.

Assessment of the psychological status of the patient identified that she had unbearable psychological problems. During the assessment her eyes were full of tears. She was highly worried about her disease condition and worried about that her elder son was unable to come and see her because he lived abroad. The most sensitive aspect of this patient was her psychological status. More attention must be paid to alleviate anxiety and depression. Her facial expression was poor and had a very sad low mood and complained about poor sleep during the night.

According to her explanation she had spiritual problems too. She is Buddhist and has done only good things in the past. She verbalized her inner conflict about beliefs, asking why this situation occurred to me. She described sleep disturbances due to the over thinking about her disease condition and her family. In addition, she described about being unable to participate in her usual religious practices because of the hospitalization. She spoke about feelings of hopelessness too.

Usual basic investigations were recommended by the medical officer assigned for medical management. She has been prescribed with Syrup Lactulose 10ml SOS, Oral tramadol 50mg bd, Subcutaneous Morphine

5mg 6H/SOS, Oral Omeprazole 20mg bd, Oral Domperidone 10mg tds, Oral Famatadine 20mg bd, Syrup Zincovit 10ml daily, Vitamin D 10000 IU daily as medication management related to the disease condition. Referrals for Nutrition, Counseling, pain management, palliative care were done for this patient.

Nursing management plays a major role in caring for the patient. Nursing interventions for this patient to relieve pain were assessed the pain level including location, characteristics, onset, duration, frequency, severity (e.g., 0 -10 scale) & precipitating or aggravating factors for pain were checked. Administer medications were prescribed as well as Non – pharmacological methods for pain relief such as education about the importance of relaxation therapy, distraction therapy and massage therapy.

Impaired nutrition less than body requirement related to nausea & vomiting was identified. To improve the nutritional status of this patient she was encouraged to take a small frequent liquid diet. Diet should be prepared according to the preference of the patient. Nurses should educate the patient and caregiver about how to prepare liquid feeding, what are the foods more suitable for this patient, and how to feed the patient. An intake and output chart for this patient had to be maintained. It was also decided to educate and assist the patient about oral hygiene and to instruct the patient about the upright position while eating and to maintain that position for 1 to 2 hours post meal. The patient had to be encouraged about adequate nutrition & hydration. It was also decided to instruct the caregiver about dehydration symptoms because poor oral intake may cause electrolytes imbalance and dehydration.

Constipation related to poor oral intake and side effects of medications were observed. Improve bowel elimination, encourage the patient to do exercise/increase physical activity, encourage regular period of elimination, administer laxatives were also decided upon. Risk for altered oral mucous membranes related to dry mouth was also seen and therefore, demonstrated methods for good oral care to improve oral hygiene. This had to be monitored and explained and signs of oral super infection (thrush) were to be watched out for. It was decided to encourage fluid intake, adequate hydration which helps to keep mucous membranes moist. Impaired skin

integrity related to leg edema was observed. The patient was encouraged to change the position every 2 hourly to maintain skin integrity and encouraged ambulation if the patient is able. Encouraged adequate nutrition & hydration reinforced the importance of turning, mobility, and ambulation regularly. The patient and the caregiver were educated about the proper skin care.

Nursing interventions of starting to improve her psychological status was advised. Nurses were asked to reassure the patient and listen to the patient carefully while allowing time to express her ideas and feelings. They were also asked to maintain frequent contact with patient and have a therapeutic relationship with her. This meant they had to talk with her and perform a therapeutic touch appropriately. They had to communicate properly with the patient to relieve anxiety, Promote calm and create a quiet environment. Arrange family meetings and discussion with the family members regarding their problems, determine the family understanding of the current situation and previous methods of coping with life's problems had to be discussed. Counseling and encouraging family members to support the patient were also advised. Involving the family members in preparing the discharge plan was also suggested because those things could relieve the anxiety and depression of the patient.

The caregiver plays a major role in palliative patients. Currently, the caregiver of this patient is a formal caregiver. Nurses should assess the health status of the caregiver too as it may help to prevent caregiver burden and provide best care for this patient.

In the evaluation of the case, nursing care was provided to the patient to relieve the physical problems. Patient verbalized adequate relief of her pain and other physical problems. Patient verbalized the understanding of importance of nutritional status and oral care. However, day by day her psychological status was deteriorating. It may cause depression and anxiety. The most sensitive aspect of this patient was her psychological status. More attention must be paid to alleviate anxiety and depression. Nurses play an invaluable role in helping to improve the quality of life of women with ovarian cancer.

## DISCUSSION

One of the most prevalent malignant diseases in adult women is ovarian cancer (Furuya, 2012). When discussing about the nursing care for the patient with ovarian cancer it is imperative to consider about physical, psychological, social and spiritual needs of the patient.

Pain is the significant symptom among cancer patients. Therefore, it is important to provide care for total pain. More than any other member of the medical team, nurses spend more time with patients. They perform a crucial, active, and highly significant role in managing pain and relieve suffering in cancer patients. The psychological condition of the cancer patient, cancer pain, cancer pain treatment, harmful effects of unrelieved cancer pain, and the patient's sociocultural background must be understood by the nurse in order to manage cancer pain effectively (Mahfudh, 2011). Pharmacological and non-pharmacological intervention both play a major role in relieve the pain of the patient. Nurses should have a clearer role in cancer pain management in relation to counseling and patient education. In this case nurses take measures to relieve pain. The nurse can coordinate with the occupational therapist, social supporters, spiritual therapists and the psychiatrist to address different types of pain. It has positive effects on the patient's condition to relieve suffering. Significant outcomes achieved through nursing care include improved physical status of the patient.

Psychological distress is a common psychological health problem among patients with cancer. Nurses play a crucial role in supporting patients with psychological distress. Providing information, education, encouragement, and using evidence-based care programs including psycho-educational support programs and mindfulness/meditation-based programs relevant to the patients' preferences are important nursing interventions. When discussing about the psychological status of this patient, anxiety, low mood and poor sleep were identified. The most sensitive aspect of this patient was her psychological status. More attention must be paid to alleviate her anxiety and depression. However, her psychological status was deteriorating because of the little attention paid on it. Some study found that there were higher levels of anxiety and/or

depression which were associated with younger age, having a more advanced disease at diagnosis, having more physical symptoms, and having had the diagnosis for a shorter amount of time. Increased levels of anxiety and depression were also associated with physical symptoms and impairment (Arden-Close et al., 2008). Psychological interventions for these ovarian cancer patients are very important.

## CONCLUSION

Nurses pay more attention to the physical status of the patient. This is positive because it has an effect on relief from suffering and other physical problems. However, they do not give much attention to the psychological status of the patient. Since her psychological status was deteriorating day by day, it negatively affected the quality of life of the patient. The sensitive aspect of this patient was her psychological status. More attention must be paid to alleviate anxiety and depression. The evidence here can be used as a preliminary guide when deciding which patients to assess for anxiety and depression and whom to target when designing psychological interventions. Nursing care may involve practical, informational, and emotional support for the patient. Screening patients for psychological distress can be conducted quickly and is important to identify patients requiring additional interventions. Nurses play an invaluable role in helping to improve the quality of life for women with recurrent ovarian cancer. It is suggested to take care of the patient's mental health and to implement appropriate psychological care, and precautionary measures to minimize the level of psychological distress and to increase the patient's quality of life.

## REFERENCES

- Aletti, G. D., Gallenberg, M. M., Cliby, W. A., Jatoi, A., & Hartmann, L. C. (2007). Current Management Strategies for Ovarian Cancer. *Mayo Clinic Proceedings*, 82(6), 751–770.
- Arden-Close, E., Gidron, Y., & Moss-Morris, R. (2008). Psychological distress and its correlates in ovarian cancer: a systematic review. *Psycho-Oncology*, 17(11), 1061–1072.
- Booth, M., Beral, V., & Smith, P. (1989). Risk factors for ovarian cancer: a case-control study. *British Journal of Cancer*, 60(4), 592–598.
- Ebell, M. H., Culp, M. B., & Radke, T. J. (2016). A Systematic Review of Symptoms for the Diagnosis of Ovarian Cancer. *American Journal of Preventive Medicine*, 50(3), 384–394.
- Furuya, M. (2012). Ovarian Cancer Stroma: Pathophysiology and the Roles in Cancer Development. *Cancers*, 4(3), 701–724.
- Kurnit, K. C., Fleming, G. F., & Lengyel, E. (2020). Updates and New Options in Advanced Epithelial Ovarian Cancer Treatment. *Obstetrics & Gynecology*, 137(1), 108–121.
- Mahfudh, S. S. (2011). Nurse's Role in Controlling Cancer Pain. *Journal of Pediatric Hematology/Oncology*, 33(Supplement 2), S146–S148.
- McMullen, M., Karakasis, K., Rottapel, R., & Oza, A. M. (2021). Advances in ovarian cancer, from biology to treatment. *Nature Cancer*, 2(1), 6–8.
- Nezhat, F. R., Apostol, R., Nezhat, C., & Pejovic, T. (2015). New insights in the pathophysiology of ovarian cancer and implications for screening and prevention. *American Journal of Obstetrics and Gynecology*, 213(3), 262–267.
- Nezhat, F. R., Pejovic, T., Finger, T. N., & Khalil, S. S. (2013). Role of Minimally Invasive Surgery in Ovarian Cancer. *Journal of Minimally Invasive Gynecology*, 20(6), 754–765.
- Rooth, C. (2013). Ovarian cancer: risk factors, treatment and management. *British Journal of Nursing*, 22(Sup17), S23–S30.



## Psychosocial Impact of a Young Adult Undergone a Permanent Colostomy Caused by a Perineal Injury following a Road Traffic Accident: A Case Report

Karunasingha U.D.A.D.<sup>1\*</sup>, Rajapaksha R.W.M.K.G.H.N.<sup>1</sup>, Dasanayake C.D.K.<sup>2</sup>

<sup>1\*</sup>Post Basic College of Nursing, Colombo.

<sup>1</sup>Post Basic College of Nursing, Colombo

<sup>2</sup>School of Nursing, Faculty of Humanities and Science, Sri Lanka Institute of Information Technology, Malabe, Sri Lanka

### ARTICLE INFO

#### Article History:

Received Date: 01 July 2022

Accepted Date: 15 September 2022

#### Keywords:

Permanent colostomy, perineal injury, quality of life, traumatic event, body image

#### Citation:

Karunasingha U.D.A.D., Rajapaksha R.W.M.K.G.H.N., Dasanayake C.D.K. (2022). *Psychosocial Impact of a Young Adult Undergone a Permanent Colostomy Caused by a Perineal Injury following a Road Traffic Accident: A Case Report*. Proceedings of SLIIT International Conference on Advancements in Sciences and Humanities, (11) October, Colombo, 290 - 294.

### ABSTRACT

Many traumatic injuries to the perineal area cause to live with colostomies throughout the lifetime of a person. Living with a permanent colostomy brings severe changes to the patient's life in terms of physical, social, spiritual, sexual, and psychosocial health. The aim of the present study was to explain the importance of understanding the psychosocial aspects of a young adult during a hospital stay with a permanent colostomy. This is a qualitative case study based on interpretive phenomenology. Interviews and direct observations were conducted as the data collection methods to obtain in-depth information regarding the case study topic and gathered data through patient direct observation. The study was about a 28-year-old male engineer who met with a road traffic accident that severely damaged his perineal area and finally undergone a permanent colostomy due to loss of anal sphincter muscles and anal opening. The data analysis was performed by the method of content analysis.

This incident was a huge psychological disaster for him to accept the reality and adjust his permanent colostomy. Young people may have profoundly negative impacts on permanent colostomies. Adaptation is a long-term process that requires effective communication, acceptance and understanding. Nurses should

\* Karunasingha, asanthidilhara@gmail.com

be vigilant to do careful assessment on psychosocial needs of patients with permanent colostomies in order to improve the quality of their lives. Therefore, it is suggested that the nurses should acquire specialized knowledge, skills, and training on stoma care in order to provide personalized holistic care to the patients who have undergone permanent colostomies.

## INTRODUCTION

Perineal injuries due to blunt pelvic perineal traumas are the worst type of associated anal sphincter injury. Severe injuries to anal sphincters required permanent stomas to prevent lifetime incontinence. Patients with permanent colostomies face significant life changes in a traumatic way. Experiencing the traumatic event, living with the new reality and efforts to improve quality of life are challenging for a patient with a permanent colostomy. Living with a permanent colostomy brings severe changes to patients' lives in terms of physical, social, spiritual, sexual, and psychosocial health. This shocking change makes the patients, difficult to cope with their stomas and life modifications.

This study explains the life experiences and feelings of a young adult while undergoing a permanent colostomy following an unfortunate road traffic accident. The aim of the present study is to explain the importance of understanding the psychosocial aspects of a young adult during a hospital stay with a permanent colostomy. A qualitative research approach was used to conduct this study to explore the patient's experiences, views, and emotions towards permanent colostomy. Data collection methods were interviewing and gathering data associated with direct observation of the patient. Through interviewing, the researcher can collect rich data by giving the participants the opportunity to express themselves freely (Merkouris, 2008). Data analysis was conducted demonstrating the client experiences and emotions by his own words. The data analysis was done by manually in the present study.

Three main themes emerged from the analysis of data as extreme emotions towards the new reality due to the traumatic event, personal and social changes due to permanent colostomy and efforts to improve quality of life.

## CASE REPORT

A 28 years old, male Engineer who works at a leading engineering company in Sri Lanka, was admitted to the Emergency Service Department following a road traffic accident while he was traveling to his workplace on a motorbike. He was knocked on a blunt edge of a lorry and thrown away from the road. The patient had been admitted to the Emergency Department with a deep perineal laceration. On admission, the patient was conscious, GCS – 15/15 and there was bleeding from the perineal area. R/S abdominal abrasion+, L/S scapula Fracture+. Immediately, the patient was sent to the operation theater after taking the informed consent.

The patient underwent "Perineal wound exploration and Transverse Colostomy under General anesthesia at the same day of his accident. Transverse colostomy was done due to extensive tissue loss of the perineum and the external sphincter of the anus was partially lost. The patient was transferred to the surgical ward after the surgery.



Figure 1: Before the surgery (perineal area)



Figure 2: After the Surgery (perineal area)

According to him, initially he suffered with severe pain from the surgical wound after the surgery. Oral paracetamol/6h, Oral. Diclofenac Sodium 50mg/8h and S/C Morphine 5mg / 6h were administered for the pain management.

His perineal wound was dressed with Betadine-soaked gauze towels. IV Cefuroxime 750mg / 8hourly was given as antibiotics. There was a huge oozing from that wound. His Hb level decreased to 8.6g / dl and 3 point of blood was transfused in the ward. Nutrition referral was done to schedule a high protein diet as it is more important for wound healing. 1800 Calories were calculated as his daily requirement to fulfill daily nutritional need. In post operative day 5, Serum K<sup>+</sup> levels reduced to 3.0mmol /L. Oral KCL 1tab / Daily was given and after 9 days following the surgery his perineal wound was pseudomonas+. Then the antibiotics were changed to IV Ciprofloxacin 400mg / bd as medical advice and the perineal wound was dressed with Acetic acid after that. A vacuumed draining tube had been inserted to the perineal wound site and it was a major cause for proper wound healing. The perineal wound was sutured after one month following the surgery.

Colostomy functioned well and there were semi solid fecal matters from that. The patient was referred to the consultant Gastroenterologist after the surgery to take opinion regarding the reversal of colostomy. However unfortunately, his opinion was to keep the colostomy permanently throughout the lifetime as the anal sphincter muscles and anal opening also had been lost and there is not a possibility to reverse the colostomy. The patient and his family members were informed regarding the permanent colostomy and the patient should be with the permanent colostomy throughout his lifetime.

He was in the "Denial" stage in psychologically in initial stage as he did not accept this reality. He was very anxious and worried regarding his body image as he was at his young age and already planned to have his wedding next year with his fiancé. This incident was a huge psychological disaster to him. He did not face his friends and relations and tried to isolate by himself. According to him, he worried about her professional life as a talented engineer of his company and as well as he felt fear and anxiety regarding his relationship with the young lady and his future family life. His thoughts regarding the disturbed body image, had resulted in a huge disappointment of his life as he was a person with more social interrelationships with lot of friends. His parents and relations also were not able to tolerate that unfortunate incident and they

engaged in many spiritual activities to wish him a speedy recovery. After two months of hospital stay, he was discharged from the hospital with the permanent colostomy and followed up from the Surgical clinic of his ward.

## DISCUSSION

Perineal injuries due to accidental traumas are not very common in the trauma and emergency setting. Perineal injuries due to blunt pelvic perennial trauma was the worst type associated anal sphincter injury. Severe injuries to anal sphincters, require permanent stomas to prevent lifetime incontinence especially, young people may have profoundly negative impact against permanent colostomies.

Patients' experiences undergoing colostomy have been studied before and after ostomy creation. According to a relevant study, patients shortly after ostomy surgery expressed feelings of uncertainty and anxiety derived from the disease and the ostomy itself, and these negative emotions remain for quite some time after surgery (Capilla et al., 2019).

In this case study, the patient has experienced denial, anxiety and fear, low self-esteem, body image disturbance, impairment of social relations, and adjustment problems during the hospitalization period. Various studies showed the psychosocial complications of individuals with stomas and their adjustment. Psychosocial problems identified in this study were low body image perception and self-respect, depression, and anxiety, influenced coping, and less psychosocial adaptation (Ayaz-Alkaya, 2019).

The lives of stoma patients also seem to be affected by aging, as elderly people experience more constrains in physical functions, while young people are more concerned with emotional issues and future economic perspectives (Andrade et al., 2016). Most of the patients with permanent colostomies try to isolate themselves from others to hide the present situation. Research demonstrates issues of uncertainty, anxiety personal, professional, and social life limitations, and a tendency to loneliness, that may lead the person towards complete social isolation (Shaffy et al., 2012; Kimura et al., 2013).

The adjustments that occur in a person's life with colostomy significantly affect his/her interpersonal and intimate relationships. The



adoption of a new life model adapted to the colostomy management has an emotional impact on the patient himself and the people in his close environment, such as his family and sexual partner (Andrade et al., 2016). Further, Capilla et al. (2019) revealed that the professional lives of colostomy patients are severely affected, as having a colostomy may provoke a partial or complete loss of work. Patients with permanent colostomy confront a variety of changes that lead to a reduction in social participation, as they are often isolated from others (De Campos et al., 2017). The young adult in this case study did not accept the reality at the initial stage as psychologically he was at the "Denial" stage as he was unable to adjust his feelings to hold a permanent colostomy throughout his lifetime. Alkaya et al., 2019 revealed that this phase may last for weeks or months and delays the adaptation process. During this phase, the individual denies or minimizes the significance of the event and defends himself against the implications of the crisis (Ayaz-Alkaya, 2019).

In this case study, the patient was with a greater worry regarding loss of his role as a professional as he was an efficient worker of his company. Male patients experienced role loss, as they felt they were no longer able to provide financial support to their families. Similarly, role loss was experienced by participants whose work provided them with a context to express their male identity and their role in their family. Returning to work was conceptualized by patients as an important factor for a smooth transition back to family and social life (Capilla et al., 2019).

As health professionals, it is important to understand patients' psychosocial aspects during the hospitalization period to improve their quality of life as well as to prevent future complications. Danielsen et al. (2013) revealed that long-term support and counseling, establishing ostomy support groups, a home visit program to ensure continued ostomy care, and enhancing long-term patient compliance are strategies to help accelerate adaptation in of these patients. It is essential to ensure that patients are discharged home from hospital with adequate understanding about the care of their stoma as this has a positive effect on their quality of life.

The care from health professionals should go much further than providing kits, booklets and self-care guidance regarding the colostomy and

the collection bag. Expanding the possibilities of active social life despite the need for adaptations is also important. In addition, spaces for discussion of social prejudice and stigmas can be disseminated in society for the implementation of integral care (Violin & Sales, 2010).

Patients' experiences undergoing colostomy have been studied before and after ostomy creation. According to Kimura et al., (2013) patients shortly after ostomy surgery expressed feelings of uncertainty and anxiety derived from the disease and the ostomy itself, and these negative emotions remain for quite some time after surgery. Research evidence also referred to patients' feelings of identity changes in quality of life, roles, and relationships, embarrassment because of the changes in body image, fear, and situations of shame and frustration (Capilla et al., 2019). Research studies revealed that, although colostomy is considered the most suitable therapeutic approach, it can inevitably cause problems for both physical and psychosocial functioning and affect the quality of life (QOL) by altering the patient's self-image, defecation patterns, and lifestyles (Shaffy et al., 2012).

Assistance for this patient should be planned considering the physiological aspects along with psychological care, aiming at integral care of the patient's needs. It is essential that all professionals participate effectively in the care process, categorized as a continuous follow up during hospitalization for surgical treatment. There is also a need for reflection on the organization of the health system to include adequate care for patients with stoma in order to integrate them into society as citizens and to include new demands for care.

## CONCLUSION

In conclusion, permanent colostomies following unfortunate traumatic events impact patient's physical, psychological, sexual, social, and spiritual domain of their life. Especially, young people may have profoundly negative impact against permanent colostomies. Psychosocial aspects should be addressed among these as it brings negative feelings, impacting all aspects of patients' lives. Emotional and organizational support, autonomy, education, and self-management may improve quality of life. The study findings indicate that there were many psychosocial



impacts on a young adult who has undergone a permanent colostomy due to a traumatic event. Knowledge derived from this research could positively impact both clinical and community care. The changes induced by colostomy in a young daily routine are so tremendous that they adversely affect all aspects of life, including intimate relationships, professional conditions, and financial conditions. Therefore, nurses should be vigilant to assess their physical needs as well as the psychosocial impacts of the patients with permanent colostomies. Adaptation is a long-term process that requires effective communication, acceptance and understanding. A nurse is the key person for assisting stoma patient to gain empowerment, support, and acceptance for managing and adapting the new life conditions effectively. It is recommended that the nurses should acquire specialized knowledge, skills, and training on stoma care for providing personalized holistic care to the patients who have undergone permanent colostomies.

## REFERENCES

1. Andrade R.S., De Medeiros L.P., Freitas L.S., Queiroz C.G., Xavier S.S.D.M., Lucena S.K.P., Torres G.D.V., Assunção I.K.F.C. (2016). Quality of Life Regarding People With An Ostomy: Integrative Review About Related Factors. *Int. Arch. Med.* 2016;9:1–13.
2. Ayaz-Alkaya S., (2019). Overview of psychosocial problems in individuals with stoma: a review of literature. *Int Wound J*, 16 (2019), pp. 243-249
3. Capilla Díaz C., Nieves C.B.D.L., Hernandez-Zambrano S.M., Montoya-Juarez R., Morales-Asencio J.M., Pérez-Marfil M.N., Hueso-Montoro C. (2019). Living With an Intestinal Stoma: A Qualitative Systematic Review. *Qual. Health Res.* 2019;29:1255–1265.
4. Danielsen A.K., Butcharth J, Rosenberg J. (2013). Patient education has a positive effect in patients with a stoma: a systematic review. *Colorectal Dis.* 2013;15(6):e276–e283.
5. De Campos K., Bot L.H.B., Petroianu A., Rebelo P.A., de Souza A.A.C., Panhoca I. (2017). The impact of colostomy on the patient's life. *J. Coloproctol.* 2017;37:205–210.
6. Kimura C.A., Kamada I., Guilhem D., Monteiro P.S. (2013). Quality of Life Analysis in Ostomized Colorectal Cancer Patients. *J. Coloproctol.* 2013;33:216–221.
7. Merkouris, A. (2018). *Methodology of Nursing Research*; Hellin: Athens, Greece.
8. Shaffy S., Kaur S., Das K., Gupta R. (2012). Physical, Nutritional And Sexual Problems Experienced By The Patients With Colostomy /Ileostomy: A Qualitative Study. *Nurs. Midwifery Res. J.* 2012;8:210–222.
9. Violin M.R., Sales CA. (2010). Daily experiences of cancer-colostomized people: an existential approach. *Rev Eletronica Enferm.* 2010;12(2):278–286.



## Case Report: High-Pressure Chronic Retention (HPCR) of an Elderly Female and Ongoing Care following Permanent Urinary Catheter Placement

Wijayarathne G. H. P. D. S.\*<sup>1</sup>, Kumarasinghe, M. S.<sup>2</sup>, Dasanayake C. D. K.<sup>3</sup>

<sup>1</sup>Trainee Nurse Educator- Post Basic College of Nursing Colombo)

<sup>2</sup>Trainee Nurse Educator- Post Basic College of Nursing Colombo)

<sup>3</sup> School of Nursing, Faculty of Humanities and Science, Sri Lanka Institute of Information Technology, Malabe, Sri Lanka

### ARTICLE INFO

#### Article History:

Received Date: 01 July 2022

Accepted Date: 15 September 2022

#### Keywords:

Elderly female, High-Pressure Chronic Retention, permanent urinary catheter

#### Citation:

Wijayarathne G. H. P. D. S., Kumarasinghe, M. S., Dasanayake C. D. K. (2022). *Case Report: High-Pressure Chronic Retention (HPCR) of an Elderly Female and Ongoing Care following Permanent Urinary Catheter Placement*. Proceedings of SLIIT International Conference on Advancements in Sciences and Humanities, (11) October, Colombo, 295 - 299.

### ABSTRACT

Chronic Urinary Retention is defined as a condition of the urinary bladder in which the residual urine after a normal void exceeds 300ml. High-Pressure Chronic Retention (HPCR) differs from chronic urinary retention with four characteristics as follows, late-onset anuresis, a tense painless palpable bladder, hypertension, and bilateral hydronephrosis with hydroureter which leads to uraemia and death (Goonawardena & Sivapriyan, 2004).

A 79-year-old socially active lady has been diagnosed with type II diabetes mellitus, presented with frequency, urinary incontinence, dribbling, and urgency for three years reluctant to seek proper medical assistance by rationalizing her thoughts that this condition was normal with her advanced age.

As nurses, it is important to initiate care systematically: addressing the information-seeking behaviour of clients with permanent urinary catheters, encourage them to express their feeling and concerns on this condition, provision of necessary knowledge on the management, care, and long-term follow up on permanent catheterization of patients with HPCR and family. This would relieve patients' anxiety, and dissatisfaction, and leads to enhance patients' quality of life during their advanced age.

Further, evidence and updated clinical nursing

\* Wijayarathne, helaniwijayarathne@gmail.com

guidelines are needed on long-term care and follow-up for this unique clinical entity of elderly women.

## INTRODUCTION

Chronic urinary retention has been defined as a condition of urinary bladder in which the residual urine after normal void exceeds 300ml (Jones et al, 1991). High-pressure chronic retention (HPCR) is divided into four types: late onset anuresis, a tense painless palpable bladder, hypertension and bilateral hydronephrosis with hydroureter which leads to uraemia and death (Goonawardena & Sivapriyan, 2004).

There are studies related to urine retention among women are sparse (Yenli et.al., 2015). Although HPCR is more common among young males in Sri Lanka, Similar to Yenli et.al., (2015), Goonawardena & Sivapriyan (2004) also found eight females in their study sample.

This patient's condition has been controlled with oral antihyperglycemic drug treatment for type II Diabetes Mellitus diagnosed for 8 years back, and she was conservatively managed for the 3mm renal calculi in her right kidney in private sector two years back.

She has been suffering from gradual onset of abdominal fullness, enuresis, bilateral ankle swelling and vomiting for nearly twenty four hours. She was taken to a private hospital. She has undergone noninvasive and invasive investigations from that private hospital for five days, especially from Non-contrast CT abdomen and Pelvis, she was diagnosed as High Pressure Chronic Retention (HPCR). She was immediately referred to urology team in a state hospital with those investigations. After immediate management with urinary catheter and close monitoring of intake and output, blood investigations, her condition was settled. A flexible cystoscopy done at day twelve after onset of symptoms revealed that the urethra appeared to be normal and grossly trabeculated bladder with diverticuli presented.

## CASE REPORT

A 79 years old, a pleasant, social lady, a retired state school teacher, has been suffering from urinary symptoms such as; frequency, incontinence, and urgency for past three years. She had not taken medical assistance during

that period. But she had a previous history of 3mm renal calculi in her right kidney and managed it conservatively in a private hospital two years back.

In mid June 2022, she had developed a discomfort with abdominal fullness, urine retention, bilateral ankle swelling and vomiting three times. After undergoing through several investigations in the private sector, specially with non-contrast CT abdomen and pelvis, her condition was diagnosed as High Pressure Chronic Retention (HPCR). Then, she was immediately referred to urology team in a state hospital and got admitted into a surgical ward for further management of HPCR with investigation reports.

She spent nearly a week there and during that period she had significant sodium imbalance at day one which was managed with increasing dietary sodium intake. On admission, an indwelling catheter was inserted according to urology team request and urometer filled with nearly 1300ml of urine within 10 minutes of time. The foot end of the bed was elevated and one stat dose of Intra Venous furosemide 20mg was administered to reduce bilateral ankle swelling. By day five, the ankle swelling was reduced gradually. During her hospitalized time period, she was on oral antihyperglycemic drug (Metformin 500mg twice daily) for type II Diabetes Mellitus which was diagnosed in 2014. Her blood sugar levels were well controlled during the time period.

On the 5th day, a decision was taken to do a flexible cystoscopy at day 7. Urethra appeared to be normal and grossly trabeculated bladder with diverticuli presented according to the flexible cystoscopy. At this time, she came to know that she may have to live with permanent urinary catheter. Thereby, she got frightened, anxious and felt unhappy of having a permanent indwelling urinary catheter. She had deep thoughts on this "breaking bad news" and imagined on possible discomforts of having a urinary catheter for lifelong. Even she planned to cancel all the outdoor activities, family gatherings and annual get-together of a social group of two entertainment societies which she had kept privileged membership at Sri Lanka Broadcasting Corporation.

However, after the flexible cystoscopy, she was discharged with urinary catheter, after a month, investigation reports and follow-up date were planned to review at the urology clinic of the same state hospital. In her first visit

to the urology clinic, her urinary catheter was changed, and asked to keep that for the next one month of time.

Further, she was made aware by the urology team that she may have to live with urinary catheter for lifelong. She was reluctant to adhere to permanent urinary catheter, but she was discharged with urinary catheter and flexible cystoscopy report. Also, she was referred to urology clinic at same state hospital after one month time.

## DISCUSSION

This case report is about an elderly female with diagnosis of High-Pressure Chronic Retention (HPCR) and she was made aware of the current management including, the management of her urinary catheter for a longer period of time. Studies related to chronic urinary retention among women and their management are lacking (Goonaswardena and Sivapriyan, 2004; Mevcha and Drake, 2010; and Yenli et al., 2015).

The prevalence of chronic urinary retention in Europe was around 16% which is comparatively low with acute urinary retention (Yenli et al, 2015). Yenli et al (2015), found eight females with chronic urinary retention in their study, and their causes for chronic urinary retention were listed as: bladder CA, Utero-vaginal prolapse, bladder stones, urethral tumor, and urethral trauma.

The medical management for chronic urinary retention which includes HPCR and low pressure chronic urinary retention (LPCR) is more complex and highly individualized with renal functions, urodynamic studies, and patients' concerns. Malik et. al., (2014) suggested that management of these patients with HPCR would depend on detailed history and physical examination, urodynamic investigations that are decided on individual basis. Yenli et al (2015) and Mevcha & Drake (2010) explain that, intermittent or indwelling catheterization is indicated for abnormal renal functions or lower urinary tract symptoms with poor detrusor function on urodynamic studies. Further, these studies suggested that the definitive management requires correction of reason as possible and symptom management.

Hence, this lady has been managed with long-term indwelling catheter for nearly three months with two consecutive clinic follow-ups in the same state hospital where she was

managed for urinary symptoms. During this three-month period, the author has been communicating with her in three distant interactive communication sessions over the phone with the verbal consent of the client. The objective of this distant communication sessions was to identify self-care issues in the management of indwelling urinary catheter at home, to reduce her psychological stress by encouraging on expressing her feelings towards her medical condition, and to intervene the issues related to indwelling urinary catheter. By communicating with the patient, the authors identified that patient had got her urinary catheter changed two times, difficulty in handling/ placing her urinary catheter while travelling, and one episode of urinary tract infection. According to Prinjha, et al. (2016), nurses are the best people to find out what people know, what they need, and to ensure that patients have contact phone numbers for further information and details of reliable websites and support organizations.

Focus on this case report, the author had identified that there are "gaps on identification of patient's issues by medical staff", especially nurses who have provided nursing care for her at the state hospital. During the initial period after breaking bad news of having permanent urinary catheter, her information seeking behaviour had not been properly addressed. According to Prinjha (2016), clients wanted more technical information about the urinary catheter and information to help prevent catheter-related physical problems (infection, blockage, leaking), on sexual activity and the stabilising of catheters and about managing a social life with a catheter after having a catheter fitted.

Thereby, according to this case, after breaking the bad news, the decision to keep the urinary catheter for a longer period, made this lady dissatisfied. This was possible due to the deficit of knowledge on her medical condition and insufficient address of the gaps in communication on the medical and nursing management. So, the initiation of orienting and provision of supportive information should be given at the right time.

According to Cochran (2007), before long-term placement of urinary catheter, patient education on this condition, knowledge of possible complications of long-term catheterization, alternatives for catheter placement are highly important aspects to be

addressed during management of patients with long term urinary catheter. According to the Hospital Infection Control Manual of Sri Lanka (2021), Only persons who have had adequate training regarding the correct technique of aseptic insertion and maintenance of catheter should be involved in catheter care.

Further, according to Kralik et al (2004), as nurses, it is important to understand the perspectives of adults who live with indwelling urinary catheter especially when a catheter becomes a permanent bodily attachment. Further, Kralik et al (2004) stated that nurses may underestimate the impact that a permanent indwelling catheter may have on peoples' lives.

This lady had one episode of urinary tract infection (UTI) during the last four days of the three months at home. According to Fink et al (2012), catheter-associated urinary tract infections (CAUTIs) account for 34% of all health care-associated infections in the United States. With the prior involvement of the author on identification of signs and symptoms of UTI, this lady was able to seek immediate medical advice. This condition was managed after taking urine sample for urine full report, culture, and oral antibiotics. A study done by Cochran (2007) mentioned that the duration to keep catheter for long-term is for thirty days continuously or more and the most common complications on long-term catheterization included bacteriuria, encrustation, blockage, stones, urethral erosions, hematuria and fistula formation. Malik et. al. (2014) further states that the goals for optimal care of chronic urinary retention should be included symptom reduction, prevention of urinary tract infections, and avoidance of upper urinary tract deterioration. Also, Mevcha & Drake (2010) emphasized the follow-up care, which is essential for monitoring the responses to treatment, complications, and control the symptoms.

While inquiring her condition after discharge, there were significant gaps which were related to self-care of indwelling urinary catheter and acute psychological stress. After explaining urinary catheter care by a trainee nurse educator, the patient said that she was confident enough to practice perineal care and catheter care by herself with adequate family support. Her acute psychological stress on permanent catheter was also addressed carefully by explaining the rationale on the management of permanent urinary catheter.

The author was able to address her handling/positioning issue of urine catheter with catheter bag and she was able to buy a commercially prepared tie bag to from private institution. She was satisfied with the way of tying the catheter bag on her one thigh and verbalized that it was a great relief for her. Currently, she is able to practice her self-care with the indwelling urinary catheter with support of her family members.

## CONCLUSION

The delayed diagnosis of HPCR would lead to uraemia. The lack of awareness about management of permanent urinary catheter leads some negative consequences. As nurses, it is important to initiate care in a systematic way by addressing the information seeking behaviour of clients with permanent urinary catheter, encourage to express their feelings and concerns on this condition, provision of necessary knowledge on the management, care and long-term follow-up on permanent catheterization of patients with HPCR and family. This would relieve patient's anxiety, and dissatisfaction, and leads to enhance patient's quality of life during their advanced age.

Further evidence and updated clinical nursing guidelines are needed on long-term care and follow-up for this unique clinical entity of elderly women. With a low percentage of prevalence of elderly women and a lack of scientific evidence on follow-up care, it is difficult to generalize the findings in local setup.

## REFERENCES

- Cochran, S. (2007). Care of the Indwelling Urinary Catheter. *Journal of Wound, Ostomy and Continence Nursing*, 34(3), 282–288.  
doi:10.1097/01.won.0000270823.37436.38
- Fink, R., Gilmartin, H., Richard, A., Capezuti, E., Boltz, M., & Wald, H. (2012). Indwelling urinary catheter management and catheter-associated urinary tract infection prevention practices in Nurses Improving Care for Health-system Elders hospitals. *American Journal of Infection Control*, 40(8), 715–720.  
doi:10.1016/j.ajic.2011.09.017

- Goonewardena, S., Sivapriyan, S. (2010) High pressure chronic retention: a life-threatening clinical entity. *Ceylon Med J*; 50: 71–73.
- Hospital Infection Control Manual (2021), Sri Lanka College of Microbiologists.
- Jones, D., Gilpin, S. A., Holden, D., Relationship between bladder morphology and long-term outcome of treatment in patients with high pressure chronic retention of urine. *Br J Urol* 1991; 67: 280–285.
- Kralik, D., Koch, T., Price, K., & Howard, N. (2004). Chronic illness self-management: taking action to create order. *Journal of Clinical Nursing*, 13(2), 259–267. doi:10.1046/j.1365-2702.2003.00826.x
- Prinjha, S., Chapple, A., Feneley, R., & Mangnall, J. (2016). Exploring the information needs of people living with a long-term indwelling urinary catheter: a qualitative study. *Journal of Advanced Nursing*, 72(6), 1335–1346. doi:10.1111/jan.12923
- Madhushankha, M., Jayarajah, U., Kuruppu, C., Goonewardena, S. A., & Abeygunasekera, A. M. (2022). Clinical characteristics and outcome of high-pressure chronic urinary retention: A systematic review. *Journal of Clinical Urology*, 15(3), 204-212. <https://doi.org/10.1177/2051415821993741>
- Malik, R. D., Cohn, J. A., & Bales, G. T. (2014). Urinary retention in elderly women: diagnosis & management. *Current urology reports*, 15(11), 1-7.
- Mevcha, A., & Drake, M. J. (2010). Etiology and management of urinary retention in women. *Indian journal of urology: IJU: journal of the Urological Society of India*, 26(2), 230.
- Yenli, E. M. T., Aboaha, K., Gyasi-Sarponga, C. K., Azorliade, R., & Arhina, A. A. (2015). Acute and chronic urine retention among adults at the urology section of the Accident and Emergency Unit of Komfo Anokye Teaching Hospital, Kumasi, Ghana. *African Journal of Urology*, 21(2), 129-136.



## Care of an Adult Patient who underwent a Series of Surgical Interventions for Psoas Abscess Complications with Haemophilia: Case Report

Sepalika H.M.S.<sup>\*1</sup>, Dinuka M.D.<sup>1</sup>, Dasanayaka C.D.K.<sup>2</sup>

<sup>1</sup>Trainee Nurse Educator, Post Basic College of Nursing, Colombo.10.

<sup>1</sup>Trainee Nurse Educator, Post Basic College of Nursing, Colombo.10.

<sup>2</sup>Senior lecturer, Head of School of Nursing, Faculty of Humanities and Sciences, Sri Lanka Institute of Information Technology

### ARTICLE INFO

#### Article History:

Received Date: 01 July 2022

Accepted Date: 15 September 2022

#### Keywords:

Psoas Abscess, Haemophilia, Vacuumdressing, Ileostomy, Sigmoidectomy

#### Citation:

Sepalika H.M.S., Dinuka M.D., Dasanayaka C.D.K. (2022). *Care of an Adult Patient who underwent a Series of Surgical Interventions for Psoas Abscess Complications with Haemophilia: Case Report*. Proceedings of SLIIT International Conference on Advancements in Sciences and Humanities, (11) October, Colombo, 300 - 305.

### ABSTRACT

**Introduction:** Psoas abscess is a collection of pus in the iliopsoas muscle compartment. Haemophilia is an inherited congenital bleeding disorder with a lack of clotting factors. Patients with haemophilia commonly bleed in joints and muscles and experience delayed wound healing.

**Case Report:** A 50-year-old individual was admitted to the medical ward with fever and abdominal pain with the diagnosis of Haemophilia A and with regular treatments for 37 years. Subsequently he was diagnosed with an infected psoas abscess which was not cured even with IV antibiotics. The patient underwent a series of surgical procedures including drainage of infected hematoma, vacuum dressing application, exploratory laparotomy, sigmoid colon resection and end-to-end anastomosis. Currently, the patient is experiencing delayed wound healing, ongoing septicaemia, nutritional deficiency, psychological defects, and socio-economic issues. There were many treatment strategies used for treating this patient including intravenous (IV) antibiotics, transfusion of clotting factors, blood transfusion, and surgical, psychological, and nutritional interventions. However, compassionate holistic nursing care was provided to this patient for his psychological stability.

\* Sepalika, hmssepalika@gmail.com

**Conclusion:** Infections, delayed healing, prolong hospitalization, psychological distress and nutritional deficit were identified as complications of chronic Haemophilia A. Maximum effort was made to relieve the patient's pain, psychological defects, nutrition, and knowledge. Using a holistic approach was very important in providing effective and, compassionate care. Collaborative care with the patient's family members created a trustworthy relationship that promoted continuity of care and the psychological wellbeing of the patient.

## INTRODUCTION

Psoas abscess is a collection of pus in the iliopsoas muscle compartment (Mallick et al., 2004). Psoas abscesses are very rare and diagnosed by Computer Tomography (CT) and reported worldwide incidence of about 12 cases per year (Garner et al., 2007). According to Muckley et al. (2003), most of the psoas abscesses of the patients are identified during the performance of post-mortem activities.

Haemophilia is an inherited congenital bleeding disorder with a lack of clotting factors; especially factor VIII and factor IX. This is an X-linked disorder which is caused by variants of genes of the X chromosome occurs 1: 5000 males primarily. Females act as carriers.

Bleeding into the joints and muscles is more common among patients with Haemophilia. Haemostasis is considered the 1st phase of wound healing followed by inflammation, proliferation and remodelling of the reconstituted tissue. Platelet and fibrin clots fill the defect and form the repair process. In addition to growth factors, Cytokines are released during haemostasis that influences cellular activities necessary for healing. In patients with Haemophilia, the 1st phase of wound healing, Haemostasis is generally ineffective due to the lack of clotting factors causing an overall impairment in wound healing (Fman, 2009). For a non-healing complex wound Vacuum dressing is a therapeutic negative pressure closure system used with a suction machine to promote wound healing.

## CASE PRESENTATION

A 50-year-old male patient was admitted to a medical ward in a tertiary care setting on 10th June 2022 with fever, chills, rectal bleeding of

about 01 yoghurt cup mixed with stool, and gradual onset of lateral backache and right-side abdominal pain. That pain was dull, and aching occurred more severely on the left side than on the right side and aggravated while walking. There are three groups, haemophilia A = Factor VIII deficiency (80% – 85%), haemophilia B = Factor IX deficiency (15% - 20%) and haemophilia C = Factor XI Deficiency (very few) (World Federation of Hemophilia, 2012). This patient had been diagnosed with haemophilia A with factor VIII level 1% & factor IX level 98% at the age of 13 and was getting treatment from the Haematology clinic in the acute care setting.

On admission, the patient was conscious and rational, tachypnoea, SPO2 was maintained between 98% and 100%, had tachycardia, capillary refilling time (CRFT) was lesser than 2 sec, blood pressure was 110/70 mmHg, Capillary Blood Sugar (CBS) was 124 mg/dl while Body temperature (BT) was 100.60F. The patient had a left lower abdominal mass which was palpable, abdominal tenderness, dry skin and bilateral Knee joint pain. That pain was 5/10 according to the Numeric pain scale. The patient's height was 158cm while his body mass index (BMI) was 22.03kgm<sup>-2</sup>. After the referral to Haematology, 40% factor correction was done. The patient's pain was managed with painkillers. Ice fomentation was applied over the Hematoma. The patient was kept in a comfortable position and supported to maintain a comfortable position.

An ultrasound Scan (USS) Abdomen was done, and its findings were Left side Psoas abscess 12×8.4×10.2 cm. An irregular mixed echo gem mass and mild Hydronephrosis were identified by the USS. Blood investigations including Full Blood Count (FBC), White Blood Cell count (WBC), PT/INR/APTT, Serum Electrolytes (SE), C-Reactive Protein (CRP), Liver Function Test (LFT), Renal Function Test (RFT), and Blood & Urine for culture & antibiotic sensitivity test (ABST) were done. Some of those reports were abnormal (WBC – 19.72, CRP = 384).

One day after admission, the patient got 5 episodes of per rectal bleeding and increased abdominal pain. Although a sigmoidoscopy was planned for him, it was postponed, and the patient was sent for a Haematologist's opinion. Haemophilia is an inherited congenital bleeding disorder with a lack of clotting factors; especially factor VIII and factor IX. (World Federation of Hemophilia, 2012).



A Contrast Enhance Computer Tomography (CECT) abdomen was done 10 days later. Its finding was abscess formation in the left psoas with left renal pyelonephritis. Then the patient was referred to the surgical team and transferred to the male surgical ward and the infected hematoma was drained under general anaesthesia (GA) after 6 days of surgical ward admission. After surgery, continuous bleeding occurred through the drain tube inserted into the surgical site. Then, 2 pints of blood transfusions were done for the patient. The drain tube was blocked with clotted blood and removed by the doctor after 2 days from surgery. I dressed the patient's wound. The patient had severe pain from the wound which was managed with a painkiller. The patient was taken to the operating theatre for wound inspection, cleaning and closure of the wound. After the wound was closed, oozing started with the combination of blood, pus and food particles.

It emitted an unpleasant smell and affected the patient negatively. The patient's wound was damp; the surrounding area was contaminated with oozing. The patient complained that he was feeling discomfort with the oozing. He was concerned that he was feeling lost and that he had also lost his quality of life. Further, he was concerned that he was hopeless after having the surgery induced complications.



The patient's psychological status deteriorated and he had passive suicidal intentions. The psychological referral was done. Psychological support was given to the patient with fact to face sessions. Compassionate care was given including providing him opportunities to listen to music and talk with family members. A vacuum dressing was applied to the wound after 5 days of surgery. That dressing was detached and leaking of faecal matters occurred with huge pressure from the wound. Abdominal distension was observed. After wound cleaning, faecal matter was removed, and a vacuum

dressing was applied. A barium study was done after 2 days of vacuum dressing application and the finding revealed a formation of the fistula to the descending colon.

He looked pale and was experiencing lethargy, fatigue and ankle oedema. According to instructions given by the nutritional department, high protein liquid diets were started for the patient. The patient was educated and encouraged to get a high protein diet and the advantages of consuming a high protein liquid diet for wound healing were explained to him. After 5 days of vacuum dressing application, an exploratory laparotomy, sigmoid colon resection and end-to-end anastomosis were done under general anaesthesia. After the surgery, the patient was transferred to the Surgical Intensive Care Unit (SICU) for critical care management. One day later again another exploratory laparotomy was done under General anaesthesia. Findings revealed blood clots within the peritoneal cavity. Five days later exploratory laparotomy, another surgery, a dysfunctioning ileostomy was done with laparotomy. Drainage of pus and minimal adhesionolysis to remove multiple adhesions were done and the wound was kept open.

Then, the patient was transferred to the surgical ward for post-operative care. He was conscious and rational. The patient was hemodynamically stable. Extremities were warm while no cyanosis or sweating was observed but the skin was very dry. The patient still had the problem of insomnia. Compassionate nursing care was delivered to the patient. He was advised to fast during the day and sleep at night. The environment was arranged in a comfortable manner by providing dim lights and maintaining a quiet, clean and tidy environment. His psychological status was better than before. IV Parental nutrition therapy was continued according to the nutritional referral. A fluid balance chart was maintained. Wound care, bed bath, and pressure point care were given to the patient to improve his comfort and quality of life.

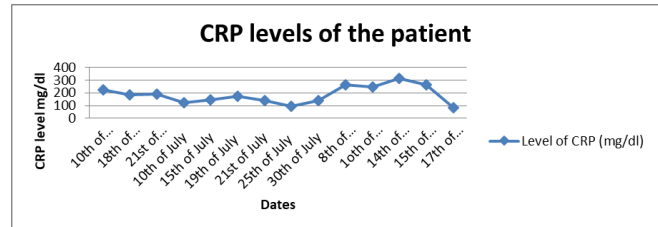
#### Discussion

The holistic approach was used to provide based on a mutual understanding of his physical, psychological, emotional and spiritual dimensions. A very close rapport and assertiveness with the patient were built following effective communication. Eye contact was always maintained while with the patient,

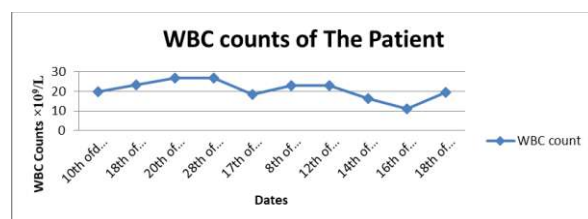
listening to the patient without interrupting, carrying out requests, asking about his needs and answering questions were done. He had psychological issues such as fear, anxiety and uncertainty and they were greater than physical issues. I understood that and spent more time with this patient and was able to find out his pressing problems like financial issues. For that companionate and collaborative care was provided to the patient. They were readministering antibiotics, transfusion of factor, blood transfusion, surgical interventions, psychology referrals and nutrition referrals etc. A multi-disciplinary team was approached to care for this patient including the surgical team, team of the Haematology unit, nurses, physiotherapists, psychologists, and nutritionist

Head to-toe assessment was conducted for this patient. Although the patient was haemodynamically stable, he was in pain at the surgical site. Guivarc (1997) further described that all serious bleeding Haematoma can cause nerve compression that causes severe radiating pain. The pain was analysed with the Numeric Rating Scale. After surgery, it was 7/10. Dry skin and cracked feet were identified as signs of dehydration. The patient had delayed wound healing, ongoing septicaemia, nutritional deficiency, psychological defects, and socioeconomic issues due to a series of surgical interventions for the Abscess. Fernandez (1996) further described that the patients who are in the acute phase are treated with coagulation factors with a combination of immobilization and pain medications.

To achieve effective and long-lasting results multidisciplinary approach to patient care focused on the education of patients and families. In my patient care, we applied multiple strategies for early recovery. Antibiotics were administrated for septicaemia which continued throughout the hospital stay. Sepsis was recognized as a systematic inflammatory response syndrome due to infections and this is a leading course of death. C - Reactive protein (CRP) and White Blood Cells (WBC) elevations are some biomarkers for septicaemia. Following charts explain the Septicaemia with CRP, WBC counts and Antibiotic administration with a timeline.



Oral Azithromycin, IV Ceftriaxone, IV Cefotaxime, IV Metronidazole, Oral metronidazole, IV vancomycin, IV Meropenem and IV Piperacillin Tazobactam were given as antibiotics. Garner et al. (2007) also described that the treatments of Psoas abscesses include anti-Staphylococcal antibiotics, IV Vancomycin, IV Linezolid and IV Clindamycin. Here as a nurse, responsibility was taken for all investigation collection, tracing reports and informing results to the doctors. While samples were always collected with consent from the patient, he was reassured and blood was drawn in a very compassionate and empathetic manner by using an aseptic method. But this patient did not respond to antibiotics and then the open exploration was done. Open retroperitoneal drainage was done as a standard method of treatment. Postoperative antibiotic therapy was also given to improve his recovery. Not only antibiotics but also an aseptic technique was followed while changing the dressing. Health education about delayed wound healing and pain management was provided to the patient. Analgesics were administered according to the doctor's opinion.



According to the article reviewed "Pain management After Surgery" by S. Shoar et al., (2012) proper pain management, particularly postoperative pain management is a major concern for clinicians as well as for patients undergoing surgery. This study is more concerned with total pain relief of post-operative management. They used different combinations of drugs. We used this method for this patient too. We administrated IV Morphine 0.5 mg /h, Oral Panadeine 1g 6/h & oral Tramadol 50mg SOS. After this painkiller was administered, the patient's general

appearance improved. He responded verbally and his pain was relieved.

Multiple surgical interventions were taken for this patient's Psoas abscess and its healing. Drainage infected Haematoma under general anaesthesia, vacuum dressing applications, exploratory laparotomy, Resection of Sigmoid Colon, Ileectomy and application of Colostomy were those surgical interventions. But the patient did not recover. There is an association between Haemophilia carrier state and poor wound healing. Prospective studies are required to confirm these findings with low factor levels and macrophage functions. According to the "evidence-based management strategies for the treatment of chronic wounds" which was done by Werdin et al. (2009) there is a challenge for both patients and practitioners. Koat (antihemophilic Factor) is used instead of clotting factor as a temporary solution. This is indicated for the treatment of classical Haemophilia. It contains clotting Factor VIII. This patient had transfused Koate several times as routings and before the surgical interventions. Fernandez (1996) described that the treatment of choice for Haemophilia is the administration of coagulation factors that are absent (Fernandez, 1996).

This patient had several blood transfusion procedures. Last Hb also 10.6g/L. The patient had a loss of appetite and was only on a liquid diet. Fluids were leaked on the surgical site and septicemic. Health education was provided to him regarding a high protein diet, advantages for wound healing, Granular tissue formation, reduced post-operative risk of infections. According to the dietitian's instructions, Total Parenteral Nutrition (TPN) was given to the patient. Oral high protein liquids such as Soup and kanjee were also added to his diet. I modified it with blended fish, liver parts and lime. High protein was added to his feeds. Health education was provided about the importance of adding fruit juice such as orange, banana, papaya and vegetable soup. The patient's fluid balance charts were maintained and fluid management was done accordingly.

According to the reviewed article of 18 publications on the effect of hospitalization on emotional and psychological well-being among adult patients conducted by Nalgi (2021), it was suggested that health care providers need to understand how hospitalization impacts

patients' emotional status and the need to provide high quality care. Factors include the effect of admission; these also influence hospitalization experience, the role of health care providers, and the patient's characteristics. Psychological stress was high in this patient. Following very friendly communication, this patient's psychological status was assessed. The author listened to the patient well and managed to understand his personal values. By communicating with family members nurses could provide trust worthy care to the patient. Health education was provided regarding disease progression and treatment strategies to the patient. Psychology referral was done. With that Sertaline 50mg giving to relieve symptoms. Psychological support was enhanced with by giving medications, nursing counselling and allowing the patient to stay with family members.

## CONCLUSION

This patient faced more surgical complications due to his chronic Haemophilia A condition such as infections, delayed healing, long hospitalization, psychological distress and nutritional deficit. The patient experienced despair due to surgical complications. He and his family members were facing many problems due to financial constraints. Patient safety was ensured and maximum efforts should be taken to prevent injuries. As a nurse, I did my maximum to relieve him of his pain, psychological defects, nutrition, and knowledge. Using a holistic approach is very important in providing effective and, compassionate care. Collaborative care with the involvement of patient's family members creates a credible relationship that promotes continuity of care.

## REFERENCES

1. Chir J., (1997). Haematoma of the iliac psoas muscle, 29 cases, Pub Med. PMID: 9682753. 134(9-10): 382-9
2. Fernandez P.F., Hernandez S.R., De Bosch N.B., De Soez A.R. (1996): Hematoma within the iliopsoas muscle in Hemophilic patients: the Latin American experience Clin Orthop Relat Res. 1996, 19-24. 10.1097/00003086-199607000-00005
3. Garner, J. P., Meiring, P. D., Ravi, K., Gupta. R. (2007). Psoas abscess – not as rare as we

- think? Colorectal disease. 9 (3) P. 269-274 Wiley Online Library.
4. Hoffman, M. (2009) The Influence of Haemophilia on wound healing; Scientific committee on Haemostasis: Haemophilia: Basic Translational Science. Blood, 114(22), SCI-21. <https://doi.org/10.1182/blood.V114.22.SCI-21.SCI-21>. Accessed on 1. 10.2022
  5. Korenkov M, Yücel N, Schierholz JM, Goh P, Troidl H. Psoas abscesses. Genesis, diagnosis, and therapy. Chirurg. 2003 Jul;74(7):677-82. German. doi: 10.1007/s00104-003-0648-0. PMID: 12883797
  6. Mahajan N.P; Kumar, P., Gadod, L.; Patil, T.; Pawar, H. Pande, K. (2021). Study of Influence of Hemoglobin Levels during Healing of Soft-tissue Wounds of High Energy Trauma to the Extremities. International Journal of Scientific Study | March 2021 | Vol 8 | Issue 12. Print ISSN: 2321-6379 Online ISSN: 2321-595X. [http://www.ijss-sn.com/uploads/2/0/1/5/20153321/20\\_iss\\_mar\\_21\\_oa18\\_-\\_2021.pdf](http://www.ijss-sn.com/uploads/2/0/1/5/20153321/20_iss_mar_21_oa18_-_2021.pdf)
  7. Mallick, I.H., Thoufeeq M.H., Rajendran T.P., (2004). Iliopsoas abscesses. [Postgrad Med]. 2004;80:459.
  8. Muckley T., Schutz T, Kirschner M., et al. (1976). Psoas abscess: the spine as a primary source of infection. Spine (Phila Pa 1976) 2003; 28: E106.
  9. Rukando Z.G., Nakasujja N., Musisi S., (2013). Psychological distress among adults admitted to medical & surgical ward of a Regional Referral Hospital, Uganda; Afr Health SLI; 2013 Mar; 13(1):82-86. doi: 10.4314/ahs.VL3il.12
  10. Sandra M.N., (2001) Lippincott Manual of Nursing Practice 8th edition; 2006 Hemophilia. <http://www.imanip.com/uploads/mysite/45-cours/3-2018-63a-Heamophilia.pdf>
  11. Sandro C.De.S., Carlos H.B., Reinaldo M.C., (2016). A Simplified Vaccume Dressing System; 2016 Feb; Index Wounds 2016; 28 (2); 48-56
  12. Shoar S, Esmaeili S, Safari S. Pain management after surgery: a brief review. Anesth Pain Med. 2012 Winter; 1(3):184-6. doi: 10.5812/kowsar.22287523.3443. Epub 2012 Jan 1. PMID: 24904790; PMCID: PMC4018688.
  13. Van den Berge M, de Marie S, Kuipers T, Jansz AR, Bravenboer B. (2005). Psoas abscess: report of a series and review of the literature. Neth J Med. 2005 Nov; 63(10):413-6. PMID: 16301764.
  14. Werdin, F., Tennenhaus, M., Schaller, E., & Rennekampff, O. (2009). Evidence-based Management Strategies for Treatment of Chronic Wounds. Eplasty, 9. <https://doi.org/https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2691645/>



## Necrotizing Fasciitis: Following Uncontrolled Blood Glucose Level: A case report

Siriwardhana S.W.P.<sup>1\*</sup>, Subasinghe S.M.N.<sup>1</sup>, Dasanayake C.D.K.<sup>2</sup>

<sup>1\*</sup> Nursing Tutor Trainee, Post Basic College of Nursing, Colombo.10.

<sup>1</sup>Nursing Tutor Trainee, Post Basic College of Nursing, Colombo.10.

<sup>2</sup>Senior lecturer, Head of School of Nursing, Faculty of Humanities and Sciences, Sri Lanka Institute of Information Technology

### ARTICLE INFO

#### Article History:

Received Date: 01 July 2022

Accepted Date: 15 September 2022

#### Keywords:

Signs and symptoms, Diagnosis, antibiotics, surgical intervention, wound care, uncontrolled diabetes mellitus.

#### Citation:

Siriwardhana S.W.P.<sup>1\*</sup>, Subasinghe S.M.N.<sup>1</sup>, Dasanayake C.D.K. (2022). *Necrotizing Fasciitis: Following Uncontrolled Blood Glucose Level: A case report*. Proceedings of SLIIT International Conference on Advancements in Sciences and Humanities, (11) October, Colombo, 306 - 310.

### ABSTRACT

Necrotizing fasciitis is a rare bacterial infection that primarily involves the fascia and subcutaneous tissues. Diabetes mellitus, advanced age, and immune suppression are some of the predisposing causes of necrotizing fasciitis.

A 56-year-old lady presented with fever, diarrhea, and left lower limb knee joint pain, swelling, and high random blood glucose level, which was 564mg/dl on admission. She was diagnosed with diabetes mellitus twenty-five years ago and regular treatments were taken for twenty years then defaulted for three years. Two years back again she started to take the treatments from a local hospital. Pain over the left knee joint gradually increased within two days and suddenly she got a septic shock while her blood investigations were showing changes of sepsis while blood pressure became lower. Knee joint exploration was done on the fifth day of hospital admission and altogether three wound toilets were completed within 10 days and treated with broad-spectrum antibiotics. Hence the patient clinically improved, and blood investigations became normal.

Necrotizing fasciitis spreads rapidly in the body if not diagnosed and treated immediately. Early diagnosis is a golden fact for optimizing the disease condition as necrotizing fasciitis is a fatal disease condition. Strong antibiotics coverage, surgical interventions, proper wound care, and controlling blood glucose level lead to

\* Siriwardhana, siriwardhanawimali@gmail.com

successful recovery from necrotizing fasciitis while reducing mortality and morbidity. In nursing management, nurses can collaborate with wound management, nutritional support, and psychosocial support, as well as encourage mobilizing and educating the patient regarding diabetes mellitus and its complications.

## 1. INTRODUCTION

The first clear description of necrotizing fasciitis is given by Jones, a surgeon in USA described necrotizing fasciitis as a hospital gangrene (Singh et al., 2015). The term necrotizing fasciitis is introduced by Wilson in 1952 (Jinn-Ming, 2014). Furthermore, study reveals necrotizing fasciitis also known as flesh-eating disease, is a bacterial infection that results in the death of parts of the body's soft tissue. Cellulitis and superficial infections of the skin are differential diagnosis relevant to necrotizing fasciitis. Early diagnosis of necrotizing fasciitis is very important as early treatment leads to decrease mortality and morbidity. Therefore, necrotizing fasciitis must be treated as an emergency with repeated surgical interventions, proper wound care, and high doses of broad-spectrum antibiotics (Singh et al., 2015).

The objective of this study is to identify the proper management of necrotizing fasciitis including nursing collaboration in recognising the signs and symptoms, risk factors, diagnostic procedures, and treatment of necrotizing fasciitis through proper surgical interventions, wound care, and administration of broad-spectrum antibiotics.

## 2. CASE REPORT

A 56-year-old lady was transferred from local hospital to tertiary care hospital, general surgical ward with wound over the left side knee joint. The wound dressing was soaked with discharges. She was immobilized and bedridden as she had severe pain in wound site, on admission. She was on intravenous noradrenalin 0.1 microgram/ hour infusion. Her vital signs were normal.

Five days back she was admitted to the local hospital following fever and diarrhea for one day and pain and swelling over the left side knee joint area. At that time her blood glucose level was 564mg/dl and mixtard insulin 40IU has given as she was already on mixtard insulin

40 IU mane and 34 IU nocte for two years after diagnosed diabetes mellitus for 25 years. From 2017, she had defaulted treatment of diabetes mellitus. But in 2020 again she had decided to take medicines for diabetic's mellitus from a local hospital two years back. This lady preferred to take sweets more, especially jack fruits. Every day she ate approximately ten pieces of jack fruits. Though she was on regular medicines for diabetes mellitus throughout previous two years her blood glucose level was not controlled along with her poor dietary habits.

Day after following to the admission date this lady was transferred to a secondary level hospital for further management of uncontrolled diabetes mellitus, pain and swelling over the left side knee joint. When admitted to this hospital, she was undergoing fever and diarrhea. Although the pain and swelling over the left knee joint increased, random blood sugar was 380mg/dl. Intravenous Flucloxacillin 500mg six hourly started and continued the same dose of mixtard insulin. The following morning, her random blood glucose level was 692mg/dl. Soluble insulin 6IU infusion had started and patient was hydrated with two pints of normal saline. After two hours, her random blood glucose level was reduced to 285mg/dl. Therefore, intravenous soluble insulin infusion was stopped and revised to mixtard insulin regular dose while checking random blood sugar three times per day. After that the patient's blood glucose level reduced to normal range.

Following day at the secondary level hospital, suddenly the patient's conscious level was reduced. At that time her blood pressure was 74/40 mmHg. Once this changing she was suspected and managed as a patient with septic shock while taking into high dependency unit. Intravenous Noradrenalin 0.1 microgram/hour infusion started to prevent extravasation and tissue necrosis, and intravenous antibiotic changed into Clindamycin 600mg three times per day. An ultrasound scan of the left side knee joint was conducted, and medical diagnosis was made as severe septic arthritis. The patient was transferred to Intensive Care Unit (ICU) with intravenous noradrenalin 0.1 microgram/hour for close observations after performing left side knee joint exploration and wound toilet under spinal anesthesia. Intraoperative findings revealed necrotizing fasciitis in deep fascia according to clinical features and tissue were

sent for histology for further clarification. Next, following the surgery, she was transferred to a tertiary care hospital for further management of necrotizing fasciitis after the completion of one day observation in ICU and vitals became normal. After being admitted to the general surgical ward at the tertiary care hospital, physical and psychosocial assessments were performed on her. On admission, hemodynamically she was stable except for intravenous noradrenaline infusion. However, once she was admitted to the ward, there was a severe bleeding from the wound. Suddenly the patient was sent to the theatre and bleeding arrested after suturing the damaged artery.

All together three wound toilets were completed to remove necrosis tissues along with the antibiotic coverage and proper wound care by nurses. Patient was used to suffer from the pain in wound site especially just after finishing the wound dressing. It was about 7/10 according to the numerical pain scale. Some days there were oozing from the wound, and nurses had to dress the wound two times per day. They used some non-pharmacological methods as well as pharmacological method for relieving the pain. Morphine 7.5mg was ordered to administer subcutaneously, once a day, if it was necessary, to relieve her pain. Also, changing positions, back massages and getting the patient to understand the reality of the pain were useful in pain management. The health team arranged a high protein and low sugar diet for this patient and made sure that she received her diet in each main meal and snack. As her family was economically stable, relations were advised to bring some fruits, meals with high proteins for the purpose of rapid wound healing. Intravenous clindamycin 600mg three times per day, intravenous piperacillin 2.25g three times per day and intravenous metronidazole 400mg three times per day were continued as antibiotics.

Since the beginning of this disease, several biochemical procedures were performed with the purpose of diagnosing and monitoring of the disease progression. Full blood count, serum electrolytes, serum creatinine, serum protein, prothrombin time, liver function test were the biochemical studies of this patient. White blood cell count reduced from  $26 \times 10^3/\mu\text{l}$  to  $20 \times 10^3/\mu\text{l}$ . C-reactive protein reduced 272.5mg/dl to 209.2mg/dl. Her hemoglobin count on admission day was 8.5g/dl.

Hemoglobin level gradually decreased to 5.3g/dl though one pint of blood was transfused. Nephrology referral was done as her serum creatinine level was 3.95mg/dl. Under medical management, intravenous soluble insulin was administered till random blood sugar level was in the normal range.

During these ten days of staying at hospital she was mentally worried due to serious surgical interventions, painful dressing changes and physical discomfort. After two days of the admission, the first surgical attempted was done and the patient got sepsis shock, which resulted in elevating this patient's white blood cell counts and C-reactive protein. Gradually, noradrenalin infusion tapered off as her blood pressure, pulse, respiration become normal. White blood cell count reduced along with the intravenous antibiotics course. Hemoglobin level did not increase though one pint of blood was transfused, and it was 5.3g/dl. She underwent all three wound toilets within ten days but still there was a delay in the wound healing. Tissue culture report which was sent from local hospital was still not available. Still antibiotic coverage was being continued. Medical team decided to do a wound toilet again and took a specimen of a deep tissue for a culture. Another one pint of blood must have been transfused to correct hemoglobin level and also hematology referral had to be completed.

### 3. DISCUSSION

The term necrotizing fasciitis was introduced by Wilson in 1952 (Jinn-Ming-Wang;Hwee-Kheng, 2014). Necrotizing fasciitis is a bacterial infection spread into fascial layer and the subcutaneous tissue through the damaged skin. Bacterial infection can be classified relevant to its microbiology aspect such as polymicrobial and monomicrobial (Puvanendran et al., 2009). Several types of bacteria cause necrotizing fasciitis. The most common and well known type is gram positive group A streptococcus (Jinn-Ming-Wang;Hwee-Kheng, 2014). Other bacteria also can cause for necrotizing fasciitis which includes, *Aeromonas hydrophila*, *clostridium*, *E-coli*, *Klebsiella*.

Necrotizing fasciitis arises with many predisposing factors. In fact, this patient has been diagnosed with type II diabetes mellitus. Study findings of Perera and Kurukulasooriya (2021) reveal that diabetics mellitus,



immunosuppression, advanced age, chronic systemic diseases such as renal failure, atherosclerosis, and hypertension are considered as some predisposing factors for having necrotizing fasciitis. Furthermore, Perera, & Kurukulasooriya (2021) point out that diabetic mellitus is a co-morbidity in 67% of patients, while the commonest affected area is lower limbs and the death rate is 42%. In fact, necrotizing fasciitis develops not only in the extremities but also in head and neck, trunk, perineum, and scrotum (Jinn-Ming-Wang & Hwee-Kheng, 2014). For this patient, the mixtard insulin 40IU was given mane and 34 IU was given nocte to maintain blood glucose level.

Necrotizing infection usually spreads rapidly. Early symptoms of necrotizing fasciitis are red warm or swollen area of skin, severe pain, and fever; which is similar to the symptoms of the patient discussed in the present study. Later symptoms of necrotizing fasciitis include ulcers, blisters, pus or oozing from infected area, dizziness, fatigue, diarrhoea or nausea. Moreover, the study shows that a single organism can be seen highly presenting than multiple pathogens in necrotic tissues (Jinn-Ming-Wang & Hwee-Kheng, 2014). Early diagnosis of necrotizing fasciitis is very important as this disease becomes fatal disease if not treated immediately. There are wide varieties of diagnostic clues including both clinical signs, symptoms and diagnostic tools which are used to make early diagnosis this infectious disease (ISRN Infectious Diseases, 2020).

Necrotizing fasciitis can be cured by proper management. Though necrotizing fasciitis is a fatal infection high mortality rate can reach through medical management and surgical management. In the medical management part, the antibiotic therapy is very useful to the control of disease medical worsen. Early antibiotic therapy must be established against a wide range of microorganism (Vilallonga, et al., 2019). In this patient's condition, she is also treated with Flucloxacillin 500mg 6 hourly and Clindamycin 600mg three times a day and piperacillin 2.25g three times day at certain times to minimize the infection and promote wound healing.

In management the most effective and important treatment of necrotizing fasciitis is surgery method. It means that the surgery is the crown jewel of necrotizing fasciitis treatment.

Multiple operations are often necessary (Vilallonga, et al., 2019). In the management of this patients, knee joint exploration and several wound toilets are done. Also, the wound care is continued as recommended.

A high protein and low sugar diet is recommended for this patient and nurses are paid for continued attention and to make sure if the patient is received with the recommended diet at each time for main meals and snacks. Family members are also advised to bring some fruits which enrich vitamins and meals with high proteins for the purpose of promoting wound healing. Collaborative care with family members create trustful relationship with the patient. In nursing management, nurses should holistically approach the patient by providing perioperative care to the patients to optimize their rapid recovery. They can collaborate with better wound care while observing the pain, color, odor, or drainage of the wound (Tan, 2015). Previously she was not aware of diabetes mellitus and complications of uncontrolled blood glucose levels. But later the patient realizes that she wants to know about healthy habits so that she can practice for controlling her blood glucose in the normal level. Although the health education is provided to encourage high protein and a vitamin rich diet for promoting wound healing, there is a concern regarding providing food items rich in minerals such as vegetables and some fruits rich in Potassium as patient's serum creatinine level is high. However, the patient is referred to Urology opinion before the dietitian's opinion. Along with this, health information in management of diabetes mellitus is discussed with the patient. The patient agrees that she would follow those management strategies. Healthcare workers are used to pay their attention to the patient and provide enough time to express her concerns freely. Family members are also advised to do the same with the patient.

## 5. CONCLUSION

Necrotizing fasciitis is an uncommon soft tissue infection caused by bacteria that can rapidly affect the progression in the body. If not diagnosed early, it may end with the death of a person. This is also known as flesh eating disease. Most common causative bacteria type is streptococcus A. The diagnosis of necrotizing



fasciitis can be performed through biochemical studies' careful nursing assessment. Early diagnosis and surgical management along with medical management leads to reduce mortality and morbidity. Effective holistic nursing approach helps to increase the quality of life of the patient and optimize the rapid recovery of necrotizing fasciitis.

## REFERENCES

1. Hamm, R. (2020). Atypical Wounds- Necrotizing Fasciitis. <https://www.accessmedicinenetwork.com/posts/57884-atypical-wounds-necrotizing-fasciitis?channel-id=2015-weekly-wound-care-conundrum>
  2. accessmedicinenetwork.com/posts/57884-atypical-wounds-necrotizing-fasciitis?channel-id=2015-weekly-wound-care-conundrum
  3. Jinn-Ming-Wang; Hwee-Kheng Lim, (2014), Necrotizing Fasciitis: eight year experience and literature review; The Brazilian journal of infectious disease volume 18 issue 42.
  4. ISRN Infectious Diseases, (2020) "Retracted: Necrotizing Fasciitis: Diagnostic Challenges and Current Practices", International Scholarly Research Notices, vol. 2020, Article ID 4827404, 1 page, 2020.
  5. Kawakita, T. (2015). Association between job characteristics and job satisfaction in nurses. *Journal of Nursing & Care*, 04(05).
  6. Perera, J., & Kurukulasooriya, P. (2021). A prospective study of a cohort of patients with necrotizing fasciitis at a level 2 hospital in Sri Lanka. *Sri Lanka Journal of Surgery*, 39(1), 30.
  7. Puvanendran R, Huey JC, Pasupathy S. Necrotizing fasciitis. *Can Fam Physician*. 2009 Oct; 55(10):981-7. PMID: 19826154; PMCID: PMC2762295.
  8. Singh, G., Bharpoda, P., & Reddy, R. (2015). Necrotizing Fasciitis: A Study of 48 Cases. *Indian Journal of Surgery*, 77, 345–350. <https://doi.org/10.1007/s12262-013-0835-2>
  9. Tan, W. T. A case of post-operative nursing care experience for necrotizing fasciitis patient with poorly controlled diabetes mellitus: *Journal of nursing & care* (2015).
  10. Vilallonga, R., Mazarro, A., Rodríguez-Luna, M. R., Caubet, E., Fort, J. M., Armengol, M., & Guirao, X. (2019). Massive necrotizing fasciitis: a life threatening entity. *Journal of Surgical Case Reports*, 2019(11).
- Wang, J. M., & Lim, H. K. (2014). Necrotizing fasciitis: Eight-year experience and literature review. *Brazilian Journal of Infectious Diseases*, 18(2), 137–143.



## Knowledge and Attitudes Regarding Emergency Contraceptive Pills among SLIIT Undergraduates in Sri Lanka- Preliminary Findings of a Descriptive Cross-sectional Study

<sup>1</sup>Palanikumar S., <sup>2</sup>Rathnayake R.M.A.P.M., <sup>3</sup>Wijedasa H., <sup>4</sup>Dassanayaka C. D. K., <sup>5</sup>Anthony K.,  
<sup>1</sup>Guruge, M.L., <sup>1\*</sup>Edirisinghe, N.P  
<sup>1\*,1,2,3,4,5</sup> Faculty of Humanities and Science, Sri Lanka Institute of Information Technology

### ARTICLE INFO

#### Article History:

Received Date: 01 July 2022

Accepted Date: 15 September 2022

#### Keywords:

Emergency contraceptive pills (ECP);  
 Knowledge; Attitudes

#### Citation:

Palanikumar S., Rathnayake R.M.A.P.M.,  
 Wijedasa H., Dassanayaka C. D. K., Anthony K.,  
 Guruge, M.L., Edirisinghe, N.P (2022).  
*Knowledge and Attitudes Regarding Emergency  
 Contraceptive Pills among SLIIT  
 Undergraduates in Sri Lanka- Preliminary  
 Findings of a Descriptive Cross-sectional Study.*  
 Proceedings of SLIIT International Conference  
 on Advancements in Sciences and Humanities,  
 (11) October, Colombo, 311 - 316.

### ABSTRACT

The chance of unwanted pregnancies is higher for young people in the reproductive age. The Emergency Contraceptive Pill (ECP) is a hormonal form of birth control recommended for unprotected sexual activities when standard contraceptive methods are not utilized. As a result, it is crucial to research this topic since unsafe abortions in Sri Lanka result in increased maternal mortality rates. This study aims to assess the knowledge and attitudes toward emergency contraceptive pills of undergraduates at the Faculty of Humanities and Sciences at Sri Lanka Institute of Information Technology (SLIIT). A descriptive cross-sectional study was conducted among the first, second, and third-year undergraduates who followed their course in English at the Faculty of Humanities and Sciences, SLIIT. Study participants were chosen by a stratified random sampling method. Data was collected using self-administered questionnaires distributed via Microsoft forms. Data was presented using descriptive statistics by frequencies and percentages. The analysis included 84 participants, mostly third-year students (56%) and females (79.8%). Most of the students, (73.8%), agreed with the idea that ECP should be easily accessible. A higher number of students, (76.2%), mentioned that they would recommend ECP to a friend or a relative if needed, while (23.8%) mentioned that they would not recommend it. In conclusion, the

\* Planikumar, shouthrykesava@gmail.com

knowledge of ECP among the participants was satisfactory, and the attitudes toward ECPs were positive.

## **INTRODUCTION**

Usage of emergency contraceptive pills can help prevent unwanted pregnancies followed by unsafe abortion, which have become a global problem causing a negative impact on the well-being of women. A study done in the Bentota Medical officer of Health (MOH) reveal that 46.7% of pregnancies are unplanned, and studies conducted in Colombo Municipal council and General Hospital Matara indicate 44% and 23.3% values, respectively (Dissanayake, 2020). Therefore, these data imply the need to assess the knowledge and attitudes towards emergency contraceptive pills (ECP) among Sri Lankan youth.

Contraception is the intentional use of artificial methods to avoid pregnancy due to sexual intercourse. However, emergency contraceptive pills are used in instances such as if the woman is not on any contraception method, if a contraception accident or misuse has occurred, or in a case of rape and sexual assault. The most used emergency contraceptive pills in Sri Lanka are levonorgestrel (Postinor 1, Postinor 2)

Unintended and unplanned pregnancies are generally caused by a lack of contraception information, non-use of contraception, or inconsistent or erroneous use of effective contraceptive techniques. According to qualitative study findings in Sri Lanka, unintended pregnancies among reproductive teens are caused mainly by a desire to maintain a relationship, poor contraceptive knowledge, misinformation about contraceptive side effects, and a lack of trusted mentors (Dissanayake, 2020). Therefore, the purpose of conducting this study is to determine the knowledge and attitudes towards using emergency contraceptive pills among undergraduates of SLIIT.

This study will help to understand the level of knowledge and attitudes regarding emergency contraceptive pills and how undergraduates overcome any problem in case of an emergency. This study will further help to make students aware of contraception and awareness programs that can be carried out for large populations to prevent unwanted pregnancies.

## **METHODS AND MATERIALS**

A descriptive cross-sectional study was carried out. The Ethics Review Committee of SLIIT, Sri Lanka, granted the ethical approval.

### **Study Setting and subject recruitment**

This study was conducted at the Faculty of Humanities and Sciences, SLIIT SLIIT, Malabe. The target population consists of first, second, and third year undergraduates who can read and write in the English language of the said faculty. The calculated minimum sample size was  $n=287$  and recruited by stratified sampling technique. Strata were identified based on the academic year.

## **DESCRIPTION OF DATA COLLECTION**

A pre-tested self-administered questionnaire was used for data collection. The questionnaire was distributed via MS form to the official email addresses of the participants. The questionnaire consisted of 3 sections (sections A, B, and C). Section A included questions related to the socio-demographic data of the participants (field of study, year of study, gender, age, nationality, province, religion, and ethnicity). Section B included a question to assess the knowledge of emergency contraceptive pills. Section C had questions related to attitudes regarding contraceptives.

## **DATA ANALYSIS**

Data was analyzed by IBM SPSS (22.0 version) software, and statistical analysis was done by applying descriptive statistics. Results were presented as frequencies and percentages.

## **RESULTS**

Out of 287 calculated sample, a total of 84 responses were included in this preliminary analysis. Most respondents were third-year students (56%), while the second-year and first-year students were 21.4% and 16.7%, respectively. Among the above students, the highest number of answers were provided by the department of biotechnology students (56.0%), while 13.1% were by nursing students and 11.9% by psychology students.

### **a. Distribution of Knowledge on Emergency Contraceptive Pills**

Among the respondents, 84.5 % had heard of ECP. A considerable number of students, 55 (65.5%), knew they could obtain ECP from the pharmacy. Others knew they could obtain it from the hospital and community health care centers with 2.4% and 7.1%, respectively. Only 22 (26.2%) students knew the correct time gap between the doses. According to the

respondents, 40.5% of students knew that one or two tablets are included in ECP, and 48.8% stated they didn't know, while others stated there are 4 tablets, 8 tablets, and 28 tablets in percentages of 3.6%, 2.4%, and 4.8%, respectively. Further, results on knowledge of ECPs were tabulated as shown in Table 1.

Table 1: Descriptive statistics on knowledge of ECP (n=84)

Questions regarding knowledge of ECP	Yes		No		Don't Know	
	(%)	frequency	(%)	frequency	(%)	frequency
Have you ever heard of Emergency Contraceptive Pills?	84.5	71	15.5	13		
ECP may cause health problems	71.4	60	28.6	24	-	-
ECP may result in complications in getting pregnant in the future	70.2	59	29.8	25	-	
ECP use may be illegal	31.0	26	69	58	-	
ECP will prevent sexually transmitted infections and even HIV/AIDS	20.2	17	79.8	67	-	
Sources of information- Formal education	71.4	60	28.6	24	-	
Sources of information- Friends or neighbors	47.6	40	52.4	44	-	
Sources of information- Media, printed materials & internet	83.3	70	16.7	14	-	-
Sources of information- Health professionals	54.8	46	45.2	38	-	-
Do you need a prescription to obtain Emergency Contraceptive Pills?	7.1	6	57.2	48	35.7	30
Do Emergency Contraceptive Pills terminate a pregnancy?	40.5	34	22.6	19	36.9	31
Is it more effective to take Emergency Contraceptive Pills soon after unprotected sexual intercourse?	50	42	22.6	19	27.4	23
Emergency Contraceptive Pills are effective when taken before sexual intercourse.	23.8	20	29.8	25	46.4	39

Emergency Contraceptive Pills are effective more than natural methods of contraception.	47.6	40	14.3	12	38.1	32
Emergency Contraceptive Pills are effective when taken 72 hours after unprotected sex.	32.1	27	28.6	24	39.3	33

**b. Distribution of Attitudes on Emergency Contraceptive pills**

The majority of the students, 38 (45.2%), were uncertain whether the availability of ECP might promote promiscuity among students. While 24 (28.6%) agreed with the idea that if ECP was readily available, it might promote promiscuity among students. Further results on attitudes towards the use of ECPs were tabulated as shown in Table 2.

Table 2: Descriptive statistics on attitudes towards the use of ECP (n=84)

<b>Attitudes towards ECPs</b>	<b>Strongly Agree (n) %</b>	<b>Agree (n) %</b>	<b>No opinion or uncertain (n) %</b>	<b>Disagree (n) %</b>	<b>Strongly disagree (n) %</b>
If emergency contraceptive pills are readily available; will they promote irresponsible behavior?	(4) 4.8	(20) 23.8	(38) 45.2	(17) 20.2	(5) 6
Emergency Contraceptive Pills should be easily accessible for use	(23) 27.4	(39) 46.4	(21) 25.0	(1) 1.2	(0) 0
Emergency Contraceptive Pills have to be at low cost/ affordable	(22) 26.2	(36) 42.9	(23) 27.4	(3) 3.6	0
Emergency Contraceptive Pills have to be available to victims of rape only.	(8) 9.5	(14) 16.7	(19) 22.6	(24) 28.6	(19) 22.6
Emergency Contraceptive Pills have to be available without prescription	(22) 26.2	(24) 28.6	(24) 28.6	(11) 13.1	(3) 3.6
Emergency Contraceptive Pills have to be available only for women over 18 years	(5) 6.0	(17) 20.2	(29) 34.5	(16) 19.0	(17) 20.2
<b>Attitudes towards ECPs</b>				<b>Yes</b>	<b>No</b>
From what you know about Emergency Contraception, do you think you would ever use it?				(39) 46.4	(45) 53.6
If 'yes,' will you recommend it to a friend or relative in case of need?				(64) 76.2	(20) 23.8

## DISCUSSION

The current study was conducted to describe the knowledge and attitudes on ECPs among undergraduates of SLIIT. Population increase has become one of the world's most pressing issues in recent years. Yared, Sahile, and Mekuria (2017) state that according to figures from the World Health Organization 2019, the world population is estimated to be over 7.7 billion people. Contraception's introduction and widespread usage in the developed world in the second half of the twentieth century is signified as an effective method for birth control and avoiding undesired pregnancies. Emergency contraceptive pills have recently entered the market due to scientific developments. As Sri Lanka is a multi-cultural country, university students from different areas might have different ideas about contraception. Undergraduates are at risk for unintended pregnancies due to new relationships.

As per the current study, 84.5% of undergraduates have heard about ECP, whereas a study done at Kothalawala Defence University reports it as 69.1% (Botheju et al., 2017). In this study, 71.4% agree that using ECPs may cause health problems; in parallel studies, two-thirds fails to identify the most common side effects or the effectiveness rate of ECPs (Delaram & Rafie, 2012).

In the current study, 57.1% of the students knows that they do not need a prescription to buy ECPs, whereas 7% of students are not aware of it. According to Botheju et al., (2017) only less than half of the students, (43.7% ) know that they do not need a prescription to obtain ECPs. Further, in the current study, 50% of the students know that ECPs are effective when taken soon after unprotected intercourse, while 27.4% are not aware of it. Parey et al., (2010) indicate that a study conducted in Trinidad has found that 62% knew ECPs are more effective when taken soon after unprotected sexual intercourse.

Regarding the correct dose, 40.5% of students knows that the right dosage of ECPs, in contrast to a study conducted by Delaram & Rafie (2012) which states that most of the respondents know the correct number of contraceptive pills to be used in an emergency.

Most of the students, 62 (73.8%), agree with the idea that ECP should be easily accessible. Majority of the students (45.2%) has no opinion

on whether ECPs promote irresponsible behavior, whereas 28.6% has agreed with that statement. A similar response is obtained by the study conducted by Botheju., et al (2017), according to which 45.8% of students have answered that it might promote promiscuity while 13.5% have disagreed and a considerable number of the students are unsure. In the present study, only 46.4% of students have stated that they would ever use it in the future, while 76.2% have indicated that they would recommend it to a friend or relative in case of need. The study by Botheju., et al. (2017) reveals that a higher number of students (57.7%) have responded that they might use ECP in the future, and 43% of respondents are intended to recommend ECP to a friend or relative.

At the same time, as a limitation, it should also be stated that there is an unwillingness of students to access MS forms by using university credentials due to time consumption which is seen as a significant drawback to gaining the expected amount of responses

## CONCLUSION AND RECOMMENDATIONS

In conclusion, it can be stated that knowledge and attitudes among undergraduates are at a good level. Nevertheless, there is a lack of knowledge regarding the time gap, correct dosage, and effectiveness of ECPs when taken before sexual intercourse. The attitudes toward ECPs are positive, although most students state that they would not use them in the future.

Therefore, health professionals need to spread awareness and provide knowledge to fill the gaps in knowledge about the usage of emergency contraceptive pills among the youth. It is also required to change students' negative attitudes or misconceptions towards ECPs.

## REFERENCES

1. Botheju, G. J. I., Samaratunge, M. A. B. B., Fernandopulle, B. M. R., Priyadarshanie, M. N. (2017) Knowledge and attitudes regarding the Emergency Contraceptive Pills among the Defence University students in Sri Lanka. 2017
2. Delaram, M., Rafie, H., (2012) Knowledge and Attitudes of Emergency Contraception among Medical Science Students at

Shahrekord University of Medical Sciences in Iran. *Future of Medical Education Journal*, 2012; 2(4).

3. Dissanayake, R. N. K. K. (2020) Knowledge about sexual and reproductive health among undergraduate students in Sri Lanka; *Gynecology & Obstetrics Case report*. Volume 6, Issue 4; ISSN 2471-8165
4. Parey, B., Addison, L., Mark, J. K., Maurice, B., Tripathi, V., Wahid, S., Antoine, R., and Sahai A. (2010) Knowledge, attitude and practice of emergency contraceptive pills among tertiary level students in Trinidad: a cross-sectional survey. *West Indian Medical Journal*, 2010;59(6).
5. Yared, A., Sahile, Z. & Mekuria, M. (2017). Sexual and reproductive health experience, knowledge and problems among university students in Ambo, central Ethiopia. *Reprod Health* 14, 41 (2017).

# Psychology





## Impact of Health Beliefs on Covid-19 Related Preventative Health Behaviours and Coping Behaviours

W. A. Sakuni Weerasinghe<sup>\*1</sup>, Sachini Akuretiya<sup>2</sup>

<sup>\*1</sup>University of West London

<sup>2</sup>University of West London

### ARTICLE INFO

#### Article History:

Received Date: 01 July 2022

Accepted Date: 15 September 2022

#### Keywords:

Health Beliefs; Preventative Health Behaviour;  
Coping Behaviour; Covid-19

#### Citation:

W. A. Sakuni Weerasinghe, Sachini Akuretiya. (2022). *Impact of Health Beliefs on Covid-19 Related Preventative Health Behaviours and Coping Behaviours*. Proceedings of SLIIT International Conference on Advancements in Sciences and Humanities, (11) October, Colombo, 318 - 322.

### ABSTRACT

Non-adherence to health regulations during the Covid-19 pandemic has been associated with health beliefs. Thus the present study studies the impact of these health beliefs on preventative health behaviours and coping behaviours. The research followed an ex-post facto survey design and convenience sampling was used to recruit a sample of 100 Sri Lankans with chronic illnesses. Data collection was carried out online using Google forms. The multiple regression analyses reveals that the Health Belief Model was a significantly useful predictor explaining 53% of the variation in preventative health behaviours. The findings reveal no significant predictive relationships between the health beliefs of perceived susceptibility, perceived severity, and perceived benefits with preventative health behaviours. Perceived barriers are found to significantly and negatively predict preventative health behaviours. Perceived self-efficacy and cues to action are found to significantly and positively predict preventative health behaviours. Educational level and marital status moderate the relationship between self-efficacy, cues to action and preventative health behaviours. In fact, self-efficacy is positively and significantly correlated with adaptive coping but not significantly correlated with maladaptive coping behaviour. Overall, the findings highlight the utility of reducing barriers, enhancing self-efficacy, and promoting health literacy through education

\* Sakuni, sakuniamanda@yahoo.com

and provision of social support, especially spousal support, to foster adherence to preventative health behaviours.

## INTRODUCTION

Adherence to appropriate Preventative Health Behaviour (PHB), which is defined as actions taken to prevent or detect disease and seek treatment (Rosenstock, 1966) has been requested to curtail the spread of the Covid-19 pandemic. As a result, Centers for Disease Control and Prevention (UK) (2022) have recommended wearing a mask, maintaining a physical distance of six (6) feet from others, and regular hand washing, despite being fully vaccinated. To encourage PHB, it appears imperative to understand the individual factors that determine them.

The Health Belief Model (HBM) (Rosenstock, 1966) is a theoretical model which evaluates health beliefs in terms of perceived susceptibility, severity of illness, benefits, and barriers in implementing PHB, self-efficacy in exercising PHB, and cues to action. Despite its utility, studies considering the complete HBM model for Covid-19-related research are few, leaving a gap in the literature.

Previous studies report mixed findings regarding the relationships between health beliefs and PHB. While some have found that perceived susceptibility and severity are significantly related to PHB (Barakat & Kasemy, 2020), other research findings have not shown a significant relationship (Arceo et al., 2021). Several studies report that perceived barriers are significantly and negatively associated with PHB (Barakat & Kasemy, 2020), whereas contrasting findings have been reported by Kim & Kim (2020). However, the perceived self-efficacy has been consistently found to be significantly and positively associated with PHB (Arceo et al., 2021). Cues to action have been found to have a significant and positive relationship with PHB (Arceo et al., 2021). The only reported Sri Lankan study using the HBM by Mahindaratne (2021) which assesses PHB as cues to action, reveals that susceptibility and severity have no significant influence on cues to action, but self-efficacy is found to positively affect cues to action. However, the present study differs in the conceptualization of the HBM by considering cues to action as part of the model and evaluating PHB separately. Hence the study is expected to provide clarity on the

relationships between the HBM and PHB within a Sri Lankan context with a sample of high-risk individuals with chronic illnesses.

The present study is also unique owing to the exploration of coping behaviours and their association with the HBM construct of self-efficacy. Studies in the western context have revealed that self-efficacy predicts positive coping (Cattelino et al., 2021). The present study aims to replicate the same results in a varied cultural context.

The main aim of this study was to explore the impact of health beliefs on Covid-19 related preventative health behaviours and coping behaviours using the Health Belief Model. An ex-post factor survey design was devised to meet the objectives, (a) to assess the strength of health beliefs and assess the utilization of coping behaviours, (b) to explore the relationship between the HBM and PHB, and (c) to explore the relationship between self-efficacy and coping behaviours. The present study hypothesizes that perceived susceptibility, severity, benefits, self-efficacy, and cues to action will positively predict PHB whereas perceived barriers will negatively predict PHB.

## MATERIALS AND METHODS

### Participants

Convenience sampling was used to recruit a sample of 100 Sri Lankans with chronic illnesses from the Colombo and Gampaha districts to conduct multiple regression analyses.

### Research Materials

A demographic questionnaire was administered to the participants to gather information on their age, gender, nationality, duration of residence in the country, marital status, educational level, type of chronic illness, and residential district. The health beliefs and preventative behaviour questionnaire developed by Barakat and Kasemy (2020) was administered to gauge the participants' health beliefs and PHB which comprised 30 test items. High scores measured on a Likert scale reflected greater use of Health beliefs and PHB.

Coping behaviours were assessed using The Brief Cope Inventory, a self-report questionnaire consisting of 28 test items which was developed by Carver (1997). Higher scores

measured on a Likert scale indicated greater use of the particular coping behaviour. According to Carver (1997), coping was evaluated as Adaptive coping behaviours and Maladaptive coping behaviours.

## PROCEDURE

The data collection was initiated by sharing the link to the Google Form bearing the research questionnaire on the researcher's social media and the data collection process spanned between September 2021 and March 2022. Once the data was gathered, the process of analysis was initiated using the Statistical Package for Social Sciences Version 26 (SPSS).

## DATA ANALYSIS

Descriptive statistics were used to examine the strength of health beliefs and coping behaviours. A series of one-way Analysis of Variance (ANOVA) tests was used to evaluate variations of PHB and coping behaviours across the demographic factors. Multiple regression analyses were used to determine the predictors of PHB from the five constructs of the HBM. Moderation analyses explored the moderating effects of age, gender, educational level, and marital status. Simple linear regression analyses were used to determine if self-efficacy can predict coping behaviours.

## ETHICS

The study was conducted with ethical approval from the Board of Ethics of the University of West London and in adherence to the British Psychological Society Code of Ethics for internet-mediated research. Participants' anonymity was maintained by assigning a participant code and no personal data were collected during the study. Only those of legal age of 18 years and above were considered to ensure informed consent.

## RESULTS AND DISCUSSION

The sample constituted of males (53%) and females (46%) with the majority being in between the ages of 26 and 35 (31%), married (66%), having completed their education up to their Advanced Levels (46%) and were from Gampaha district (74%). The most reported

chronic illness is asthma (36%) followed by diabetes (18%).

The predominant health belief in the sample is perceived barriers ( $M=21.37$ ,  $SD=6.73$ ) and the least strong is self-efficacy ( $M=4.17$ ,  $SD=1.09$ ). The most used coping behaviour is identified as acceptance ( $M=4.52$ ,  $SD=1.46$ ). Concerningly, the use of maladaptive coping of self-distraction also appears high ( $M=4.14$ ,  $SD=1.70$ ). The least used coping behaviour is identified as substance use ( $M=1.11$ ,  $SD=1.833$ ). The sample most frequently uses adaptive ( $M=28.77$ ,  $SD=8.35$ ) over maladaptive coping strategies ( $M=12.73$ ,  $SD=6.46$ ). The One-way Analysis of Variance (ANOVA) conducted reveals a significant difference for maladaptive coping based on marital status,  $F(3,96) = 3.70$ ,  $p=.014$ ) between the married and unmarried groups (Mean Difference= 3.93,  $p=.031$ ) which point to the role of spousal support in effective coping.

The findings of the set of ANOVA reveals significant main effects of age,  $F(4,95) = 3.68$ ,  $p<.01$ , and marital status,  $F(3,96) = 4.17$ ,  $p<.05$  on perceived susceptibility. The posthoc Tukey Tests confirms statistically significant differences between the 18-25 age group and 56 and above age group (Mean Difference= 1.02,  $p=.03$ ) which may be explained by the older populations being more restricted to their homes which can lower their perception of susceptibility. The significant difference between the unmarried and widowed groups (Mean Difference= 1.61,  $p=.02$ ) highlights the less social support received by widowed groups in comparison to unmarried individuals which emphasises its role in the perception of susceptibility.

Multiple regression analyses reveals that the regression model using the HBM explains 53% of the variation in PHB, and it is significantly useful in predicting the PHB,  $F(6,93) = 17.45$ ,  $p<.001$ . The regression coefficients to predict PHB are tabulated in Table 1. Accordingly, perceived susceptibility and perceived severity are found not to have significant effects on PHB which support the findings of Arceo et al. (2021) and Mahindaratne (2021). Perceived benefits are found not to have significant effects on PHB. This contrasts with previous studies (Barakat & Kasemy, 2020; Mahindaratne, 2021), but the present study findings may reflect the changes in perceived benefits over time.

Perceived barriers are found to have a significant negative effect on PHB which

corroborates with the existing research (Arceo et al., 2021; Barakat & Kasemy, 2020; Mahindaratne, 2021), whereby the increased perception of barriers led to reduced engagement in PHB. Perceived self-efficacy was found to have significant positive effects on PHB which is in line with previous research findings (Kim & Kim, 2020; Mahindaratne, 2021).

Gender,  $\Delta R^2 = .09$ ,  $\Delta F(1,96) = 11.00$ ,  $p = .001$ ,  $p < .01$ , educational level,  $\Delta R^2 = .06$ ,  $\Delta F(1,96) = 8.59$ ,  $p = .004$ , and marital status,  $\Delta R^2 = .04$ ,  $\Delta F(1,96) = 5.34$ ,  $p = .023$ , are found to be significant moderators between the relationship of perceived self-efficacy and PHB.

Table 1.

Variable	<i>B</i>	95% <i>CI</i>	$\beta$	<i>t</i>	<i>p</i>
(Constant)	17.09	[4.71, 29.47]		2.74	.007
Perceived Susceptibility	-.24	[-1.40, .93]	-.03	-.40	.688
Perceived Severity	.27	[-.17, .71]	.09	1.20	.234
Perceived Benefits	.23	[-.42, .88]	.05	.70	.485
Perceived Barriers	-.55	[-.74, -.35]	-.44	-5.46	.000
Perceived Efficacy	1.65	[.48, 2.82]	.21	2.81	.006
Cues to Action	.95	[.46, 1.45]	.30	3.81	.000

*Regression Coefficients for Predicting Preventative Health Behaviour*

Note:  $R^2_{adj} = .50$  ( $N=100$ ,  $p=0.000$ ). *CI* = Confidence Interval for *B*.

Cues to action are found to have significant positive effects on PHB which contrasts with previous findings by Barakat & Kasemy (2020). Given that educational level,  $\Delta R^2 = .10$ ,  $\Delta F(1,96) = 15.75$ ,  $p = .000$ ,  $p < .001$ , and marital status,  $\Delta R^2 = .05$ ,  $\Delta F(1,96) = 6.92$ ,  $p = .010$ ,  $p < .05$ , are significant moderators between the relationship of cues to action and PHB, it appears that adherence to health regulations can be increased by educating the public, and fostering family and spousal support.

Spearman's correlational analyses revealed that there is a significant positive association between perceived self-efficacy and adaptive coping,  $r(98) = .21$ ,  $p = .037$ , which supports previous research findings (Cattellino et al., 2021) but no significant association is found between perceived-self-efficacy and maladaptive coping behaviour,  $r(98) = -.05$ ,  $p = .633$ . This is a novel finding since previous studies on this relationship are nearly absent.

Males engaged in PHB if their perceived self-efficacy is high which implies that interventions to enhance self-efficacy can encourage PHB. Furthermore, PHB increases with increased efficacy especially for the below A/L in comparison to the above A/L group. This highlights the necessity of promoting health literacy among the public. The married group increasingly engaging in PHB with increased efficacy in comparison to the other groups which emphasizes the role of spousal support and supports previous research identifying social support as key to engagement in PHB (Kim & Kim, 2020).

## LIMITATIONS AND DIRECTIONS FOR FUTURE RESEARCH

The main limitation of the study pertains to the small sample size of 100 participants and the convenience sampling that is used to obtain data which affects the generalization of the findings. Further, the study does not account for the time-specific differences and changes in health beliefs. Therefore, future research can employ a longitudinal research design to explore this variation. A qualitative exploration of PHB in other vulnerable populations such as those with a low socioeconomic standing will yield valuable insights and capture culture-specific factors that determine health behaviour.

## CONCLUSIONS

The findings of the current study establish that the HBM constructs of perceived barriers, self-efficacy, and cues to action to predict PHB. Therefore, actions ought to be undertaken to mitigate barriers, enhance the self-efficacy of

the public, and foster cues to action to ensure adherence to PHB. It is imperative that health literacy is promoted as well as the social support particularly spousal support is fostered as effective means of engagement in preventative behaviour.

## ACKNOWLEDGMENTS

This research was not funded by any organization, public, commercial, non-profit, or otherwise.

## REFERENCES

- Arceo, E., Jurado, J. E., Cortez, L. A., Sibug, N., Sarmiento, G. L., Lawingco, A. C., Carbungco, C., & Tiongco, R. E. (2021). Understanding COVID-19 preventive behavior: An application of the health belief model in the Philippine setting. *Journal of education and health promotion*, 10, 228.
- Barakat, A. M., & Kasemy, Z. A. (2020). Preventive health behaviours during coronavirus disease 2019 pandemic based on health belief model among Egyptians. *Middle East Current Psychiatry, Ain Shams University*, 27(1), 43.
- Carver, C. S. (1997). You want to measure coping but your protocol's too long: Consider the brief. *International Journal of Behavioral Medicine*, 4(1), 92–100.
- Cattelino, E., Testa, S., Calandri, E., Fedi, A., Gattino, S., Graziano, F., Rollero, C. & Begotto, T. (2021). Self-efficacy, subjective well-being and positive coping in adolescents with regard to Covid-19 lockdown. *Current Psychology*.
- Centers for Disease Control and Prevention UK. (2022). How to Protect Yourself and Others.
- Kim, S., & Kim, S. (2020). Analysis of the Impact of Health Beliefs and Resource Factors on Preventive Behaviors against the COVID-19 Pandemic. *International journal of environmental research and public health*, 17(22), 8666.
- Mahindaratne, P. P. (2021). Assessing COVID-19 preventive behaviours using the health belief model: A Sri Lankan study. *Journal of Taibah University Medical Sciences*, 16(6), 914–919.
- Rosenstock, I. M. (1966). Why people use health services. *Millbank Memorial Fund Quarterly*, 44, 94–127.



## An Exploratory Study on Work Stress and Job Satisfaction during the COVID-19 Pandemic in Hotel Sector Employees of Sri Lanka

Ebony M.A. Bradie-Miles<sup>\*1</sup>, Donmanige Iresha Chamindi<sup>2</sup>

<sup>1</sup>Liverpool John Moores University, UK

<sup>2</sup>University of Wollongong, Australia

### ARTICLE INFO

#### Article History:

Received Date: 01 July 2022

Accepted Date: 15 September 2022

#### Keywords:

COVID-19; Work stress; Job satisfaction; Hotel employees; Sri Lanka

#### Citation:

Ebony M.A. Bradie-Miles<sup>\*</sup> 1, Donmanige Iresha Chamindi. (2022). *An Exploratory Study on Work Stress and Job Satisfaction during the COVID-19 Pandemic in Hotel Sector Employees of Sri Lanka*. Proceedings of SLIIT International Conference on Advancements in Sciences and Humanities, (11) October, Colombo, 323 - 331.

### ABSTRACT

COVID-19 has affected employees worldwide, especially in the hotel industry, with restricted travel, limited incoming flights, and guests, which presents challenges for hotels and employees. Therefore, it is essential to investigate how COVID-19 has affected hotel employees' job satisfaction and work stress. This study aimed to determine whether the stress at work generated by COVID-19 directly affects the job satisfaction of hotel employees in Sri Lanka. The researcher recruited hotel employees in Sri Lanka through purposive sampling following a selective criterion; 18 years or older, locally employed, with two or more years of industry experience. The researcher, part of a larger mixed-method project, presented the qualitative findings in this article, using a qualitative research design with semi-structured interviews to collect employee responses (N = 7) before subjecting the responses to content analysis. Ultimately, the main findings indicated that work stress generated by COVID-19 partially impacted the job satisfaction of Sri Lankan hotel employees. Other factors reported included COVID-related financial issues and procedural changes that significantly affected employees. Several solutions presented in the findings to improve job satisfaction and work stress during COVID-19 included effective financial management by hotels, and extra support, for example, counselling and improved workplace communication. Overall, the satisfaction of Sri

<sup>\*</sup> Ebony, ebony.bradiemiles@gmail.com

Lanka's hotel workers' jobs has been affected by work stress and partially by COVID-19. Therefore, future research should explore the influences of COVID-19 on job satisfaction and work stress among Sri Lankan hotel employees and throughout the world.

## INTRODUCTION

Sri Lanka (SL), known for its pristine beaches, tea, and food, was voted the Top Destination of 2019 by Lonely Planet based on new hotel development, improved transport, and various activities (Wilson, 2018). However, SL experienced two unfortunate events: the 2019 Easter Terrorist attacks followed by COVID-19. The Easter attacks of 2019 significantly affected SL with restricted travel, island-wide curfews, and countries exercising extreme caution against terrorism, consequently reducing tourist arrivals to 1.9 million (Sri Lanka Tourism Development Authority [SLTDA], 2020). Furthermore, as SL began to recover, severe acute respiratory syndrome (SARS-CoV-2), known as COVID-19 (World Health Organization, 2020), emerged, making it difficult for SL to attract tourists. With only 507,311 tourists entering before all incoming flights were suspended (SLTDA, 2020), SL's economy experienced its worst performance falling by 3.6% in 2020, and unemployment rates increased above 6%, with the tourism, construction, and transportation sectors most affected (Beyer et al., 2021). Furthermore, hotel occupancy in Colombo fell to 15-20% (World Bank Group, 2020).

COVID-19 has dramatically impacted SL's hotel industry and economy, but how has it impacted the work stress (WS) and job satisfaction (JS) of hotel employees? Identified as one of America's top 10 occupational health problems in the 1980s, WS has affected employees for decades (Quick & Henderson, 2016). WS has been defined as 'an individual's reactions to characteristics of the work environment that appear emotionally and physically threatening' (Jamal, 2005, p. 225), with everyday stressors including excessive workloads, low salaries, and support consequently harming employee mental health and wellbeing (American Psychological Association, 2018). But when WS is unresolved, it negatively impacts JS (Kim et al., 2009). Edward Locke (1969, p. 360) defined JS as a 'pleasurable emotional state resulting from the

appraisal of one's job as achieving or facilitating the achievement of one's job values.' Locke (1976, as cited in Sempane et al., 2002) additionally stated several JS 'motivators', including pay, working conditions, co-workers, and management, with the majority measured throughout this paper.

## LITERATURE REVIEW

### Work Stress and Job Satisfaction

Elevated levels of WS have led to low JS for decades (e.g., Burke, 1989), with several factors influencing both, including years of experience, support, and finance. First, both years of experience and workplace support influence JS. Mahmood et al. (2013) identified a higher WS in academics with industry experience of 0-5 years than 11-15 years, suggesting that employees with more experience have learned to deal with stress, possibly from organizational support. McLeod (2008) indicated that workplace counselling positively impacted hotel employees' JS; therefore, it may apply to hotel employees in SL. Concerning financial issues, da Borralha et al. (2016) indicated that wages and reduced benefits led to hotel employees' dissatisfaction, but Medgyesi and Zólyomi (2016) identified that higher wages increased JS, with permanent employees more satisfied, hence, impacting JS. Therefore, it is important to identify whether the above influences affect SL's hotel employees.

### Work Stress and COVID-19

With COVID-19, a new pandemic, this article investigates COVID-related WS in hotel employees. Lippert et al. (2021) qualitatively studied the work stressors American restaurant and food service employees experienced during COVID-19. The results indicated several themes, including inconsistent pay, fear of exposure to COVID-19 with inadequate safety procedures, and job insecurity, all increasing WS. However, qualitative interviews potentially limit the findings to employees in Western cultures. Therefore, we ask whether hotel employees in Asian cultures, including SL, experience similar factors. Similarly, Wong et al. (2021) among American hotel employees identified that employees' perceptions before the pandemic of the consequences of work stressors significantly differed from post-

outbreak perceptions, with demanding and unstable work environment stressors and unethical hotel work practice stressors lowering JS. Therefore, we ask whether SL's perceptions of work stressors are similar before and after the outbreak. Ultimately, COVID-19 significantly affects WS worldwide; therefore, it is important to identify/generalize COVID-19 on SL's hotel employees' WS.

### **Job Satisfaction and COVID-19**

Researchers have studied JS for decades following the 1930s Great Depression (Weiss & Merlo, 2015), and now COVID-related JS of employees is widely investigated. In a review, Rastogi and Dhingra (2020) identified all hospitality employees reported stress due to job insecurity, COVID-19 fear, and financial problems. However, several reported remaining in the organization due to satisfaction and trust in hotel management to protect employees from COVID-19. Vo-Thanh et al. (2020) similarly identified that JS with organizational responses to COVID-19 positively influenced employee job performance among Vietnamese hotel employees. Therefore, when organizations effectively handle COVID-19, employees are satisfied, questioning whether hotel employees of SL experience the same. However, Wang et al. (2020) identified that grocery store employees experienced dissatisfaction when stores did not provide protective equipment. In addition, Demirović Bajrami et al. (2020) identified that hotel employees felt insecure about their future, lowering JS. Therefore, this article measures how COVID-19 has affected the JS of hotel employees in SL.

### **Hotel Sector and COVID-19**

COVID-19 consequences appear worse in developing countries with fewer exports, reduced commodity prices, and tourism (Loayza & Pennings, 2020). Tourism is SL's main income source (Weerakkody, 2020). Following the Easter attacks in 2019, the hotels in SL may not have fully recovered when COVID-19 emerged; therefore, they are experiencing continued unresolved issues. However, hotel employees were perhaps prepared for similar circumstances, including travel restrictions, reduced tourists, and procedural changes. Regarding hotels, tourism and COVID-19,

Duarte Alonso et al. (2020) identified financial impacts and uncertainty as COVID-19 consequences among hospitality businesses, which Samarathunga (2020) similarly identified with SL's tourism organizations (hotel, travel) that release non-permanent staff, reduce salaries according to the designation, and stop salary increases. However, Nuskiya et al. (2020) found that 87% of SL's east coast hotels reported no difficulties paying employees, but payments were irregular. Therefore, COVID-19 affects SL hotels differently. Positively, Mehta et al. (2021), in customer reviews during COVID-19, identified SL received the highest customer satisfaction among Asian countries. Hence, even with COVID-19, tourists remained satisfied with SL hotels.

Ultimately, as the majority of the research previously conducted in SL on hotels during COVID-19 has focused on the hotel performance overall, it is important to consider how COVID-19 has impacted the hotel employees themselves. Therefore, by focusing on JS and WS in one research, hotel employees in SL will understand how and whether COVID-19 has had an impact. In addition, as SL is considered one of the top islands for tourist travel (Ascher-Walsh, 2021; Wilson, 2018), by studying hotel employees in SL, employees will be able to focus on continuing to deliver and meet tourist expectations as a top travel destination during COVID-19. Overall, the purpose of this article is to determine whether work stress generated by COVID-19 directly affects the job satisfaction of hotel employees in Sri Lanka. Therefore, the overarching question of the research is how, and which factors of work stress generated by COVID-19 do impact the job satisfaction of SL's hotel employees.

### **MATERIALS AND METHODS**

Before commencing, the Pro tem Psychology Ethics Review Panel of the Faculty of Humanities and Sciences granted ethical approval. For this paper, part of a larger mixed-method project using both qualitative (interviews) and quantitative (questionnaire) data, the qualitative data was presented using a qualitative research design, research based on rich textual data rather than numerical data (Howitt, 2010, p. 428). Therefore, captures an overall perspective of the WS and JS individuals' experience during COVID-19. The target



population was hotel employees in SL identified using a selective criterion: (1) locally and permanently employed, (2) white collared (e.g., HR, Accounts, Marketing, Front of House, Kitchen), (3) aged 18 or older, (4) with two or more years of industry experience. Participant recruitment involved purposive sampling, selecting participants with a particular purpose (Howitt, 2010, p. 428) from contacts received through personal connections and a mediator (a hospitality institute employee in SL).

Semi-structured interviews were conducted via zoom. The interview guide consisted of 25 questions, divided into four sections: work experience, COVID-19, WS, and JS. The mediator contacted several hotel employees by email asking for a zoom meeting to request their participation. After confirmation,

employees were contacted via email, sending participant information sheets and consent forms, and requesting a convenient time to conduct the interviews. All participants agreed to record the interviews, with debrief sheets emailed afterwards.

Interviews were conducted until data saturation, with seven hotel employees (three males, four females) participating. All recorded interviews went through verbatim transcription before content analysis, where coding units were marked (usually words, phrases, or themes) (Coolican, 2014, p. 330). Inductive content analysis was selected, which involved open coding, categorization, and an abstraction process (Elo & Kyngäs, 2008). Therefore, transforms the counted qualitative findings (themes) into quantitative results.

## RESULTS

Table 5. Table Representing Main Themes, Subthemes, Frequency, and Quotes of Interviews

Main theme	Sub-themes	Frequency	Quotes
Changes in the COVID-Related Work Environment	COVID-related procedural changes to the work environment	328	<i>"very stringent and very strict we...operated...a bio bubble in the hotel no one can just come in you come in you stay in the hotel a certain number of days and...only after clearance you're released...it's a perfect bio bubble"</i> (Interviewee 3) <i>"educate everybody to washing hands so lot of training aspect went to...educating people on the hygiene standards, safety standard then what is corona, how does it affect, how does it spread, what should you do, what is vaccination is all about so lot of education perspective from the safety standards"</i> (Interviewee 5)
COVID-Related Job Satisfaction	COVID-related increase in job satisfaction	21	<i>"Satisfaction is more because you felt bonded with the place...and though you had the work stress and extra work you felt you have done something really good...thereby it increases your job satisfaction"</i> (Interviewee 5) <i>"The entire operation and the process how we just took up precautions and everything we were so satisfied (handling COVID-19)"</i> (Interviewee 6) <i>"I'm honestly really really satisfied with the way everyone's handle things"</i> (Interviewee 2)
	COVID-related maintained job satisfaction	24	<i>"I wouldn't say it...lessened it...definitely maintained it...there was definitely no...spike in job satisfaction because of the whole...covid thing but there was definitely no drop in it either for me personally"</i> (Interviewee 7) <i>"I got sick...but it...didn't affect...my job satisfaction or anything"</i> (Interviewee 6)
	COVID-related decreased job satisfaction	26	<i>"We used to do a lot of...activities cricket matches...parties...been wiped out...and that bit is really quite...satisfying and it's just not there anymore...partly because the budgets, partly because of covid restrictions"</i> (Interviewee 2) <i>"We didn't have any increment for the past three years so we were stuck in the same salary...so that's the major part of the unsatisfaction"</i> (Interviewee 1)

COVID-Relate d Work Stress	Impact on work stress due to COVID-19	80	<p><i>"We have to operate our business in the midst of the pandemic so...I wouldn't say that at this point of time it does increase my stress level no I wouldn't say that"</i> (Interviewee 3)</p> <p><i>"A lot of stresses in having to learn new jobs we need everyone to be flexible...not be just confined to that one role so there's definite stresses"</i> (Interviewee 2)</p>
	Changes in Pressur e Levels	44	<p><i>"I wouldn't say there's a huge pressure that has been added onto me due to covid"</i> (Interviewee 7)</p> <p><i>"There's a lot of adapting and...also...it's just keeping up and the added pressure"</i> (Interviewee 2)</p>
COVID-Relate d Financi al Issues	Financia l difficulti es in hotel and employ ee	162	<p><i>"They don't get any incentive...overtime...we don't pay anymore that's one of the...steps of reducing costs by management. But actually because of the situation staff do work overtime without pay, just the basic"</i> (Interviewee 1)</p> <p><i>"We have a basic salary and then we have a service charge which is a huge portion of your total income, obviously the hotel was closed and there was no service charge"</i> (Interviewee 5)</p> <p><i>"in terms of comparison perspective...a bit of disparity of what you earn...in the element of discrimination...he's a manager he comes in...his own car I come in the bus and I get COVID (minor staff perspective)...someone would go and compare an expatriate...against a local...they are on a higher package"</i> (Interviewee 5)</p> <p><i>"It was ensured that there were no pay cuts to even outsource employees"</i> (Interviewee 4)</p>
	Financia l support	76	<p><i>"We only had...salary cuts for people who earn more like the HODs only other than that...regular team members didn't have any...pay cuts"</i> (Interviewee 1)</p> <p><i>"Senior management we went through a voluntary no pay...so then with that money we help the low income colleagues"</i> (Interviewee 5)</p> <p><i>"We...have long stay guests living...here...we have had business throughout we haven't had a drastic drop in terms of service charge... it hasn't hit us as hard because we've always had guests throughout...living in the hotel"</i> (Interviewee 7)</p> <p><i>"You depend a lot on...being given a moratorium so we don't have to pay our loans, we've also been given a few soft loans...to help...keep cash flows"</i> (Interviewee 2)</p>
COVID-Relate d Suppor t	Employ ee health and well-being	43	<p><i>"We could have done more...counselling"</i> (Interviewee 1)</p> <p><i>"it's not like we could have really invested in counselling...because everything has a monetary cost to it and we didn't have the resources"</i> (Interviewee 2)</p> <p><i>"for us number one mental health...we went to the level of expanding our counselling sessions...giving our counsellors numbers on our company account, encouraging everybody to speak up"</i> (Interviewee 5)</p>
	Commu nication during COVID-19	85	<p><i>"The communication of the department heads or the leaders have been more...effective...more frequent...the communication channels have been more open...compared to before"</i> (Interviewee 4)</p> <p><i>"I would...improve on communications because when we implement new procedure or initiative...some... information didn't stream down"</i> (Interviewee 1)</p>
COVID-19 with Easter attacks	Impact of the Easter Sunday attack on employ ees and hotels	15	<p><i>"Easter attacks put a lot of pressure, we lost staff. we lost guests...we have that sense of responsibility because it happened in our place...then...covid came so...we are a company who established such resiliency"</i> (Interviewee 5)</p> <p><i>"I mean since the easter attack...the tourism in the country and for us especially the...tourism industry its heavily affected and then soon after the easter attack...this happened (COVID)"</i> (Interviewee 6)</p>

## ANALYSIS AND DISCUSSION

This article (part of larger mixed-method research) focused on job satisfaction (JS) and work stress (WS) of Sri Lankan hotel employees (SL) during COVID-19 using qualitative interviews (N = 7) to determine whether the work stress generated by COVID-19 directly affects the job satisfaction of hotel employees in Sri Lanka. The findings identified six main COVID-related themes seen in Table 5, with WS generated by COVID-19 partially impacting JS but significantly impacting other unanticipated subthemes, including COVID-related financial issues and COVID-related changes in the work environment (stated most 328 times). Therefore, partially answered the research question.

### COVID-19, Years of Industry Experience, Job Satisfaction, and Work Stress

The years of experience of the interviewees ranged from 2.5 to 25. Interviewees with less than five years of experience stated a lower JS and greater WS impact among themselves and employees than interviewees with more than five years of experience. These findings may be due to the designation of employees compared to more experienced colleagues creating a disparity. An interviewee stated that staff complain about the higher packages managers and expatriates receive during COVID-19. Therefore, it could potentially reduce minor staff JS and increase WS; however, further investigation is needed. Furthermore, an interviewee with 20 years of experience frequently stated WS from an employee's general perspective. Instead of experiencing stress themselves, they experienced additional pressure, which could result from learning to deal with stress over time in previous organizations (Mahmood et al., 2013). These findings are consistent with previous research that identified higher WS among employees with less than 5 years of experience than 10+ years (Mahmood et al., 2013). Although the interviews did not consider age, younger employees with fewer years of experience can have greater job insecurity than older more experienced employees, especially during COVID-19, with concerns about job losses due to less experience. Therefore, reduces JS (Demirović Bajrami et al., 2020).

## COVID-19, Job satisfaction, and Work stress

JS among interviewees that remain the same or decrease more than an increase in COVID-19 was mentioned. However, COVID-related WS partially affected SL's hotel employees' JS; therefore, it may not have differed significantly before and during COVID-19, unlike Wong et al. (2020). Furthermore, all interviewees stated that they were extremely satisfied with how the hotel handled COVID-19, supporting Rastogi and Dhingra (2020) and Vo-Thanh et al. (2020). Therefore, SL's hotels can handle COVID-19 more effectively with satisfied guests than hotels worldwide, especially in Asia (Mehta et al., 2021), which could be further explained by the unanticipated theme 'COVID-19 with Easter attacks' (stated 15 times). After experiencing such adverse events, one interviewee stated that they established resilience, meaning that hotel employees may already have been prepared to face similar circumstances created by COVID-19. Further research should investigate JS and resilience to COVID-19 and Easter attacks.

Furthermore, one reason for the lower impact of COVID-19 on WS and JS may be the 'COVID-related support', with interviewees stating continuous communication (85 times) and several providing counselling (stated 43 times) to potentially maintain or increase JS and reduce WS. Previous research supports this, with workplace counselling increasing JS (McLeod, 2008). However, several interviewees stated that they did not provide counselling due to financial constraints and that an interviewee wanted to improve communication.

Although the WS generated by COVID-19 partially impacted JS, the interviewees mentioned other unexpected reoccurring themes that affect themselves and their employees. Including 'COVID-related financial issues' (162 times) and 'COVID-related procedural changes' (328 times). Taking into account COVID-related financial problems, most interviewees experienced financial difficulties, such as lost revenue, service charge and tips, zero overtime pay or salary increases, and pay cuts, supported by research stating that COVID-19 significantly impacted finances (Duarte Alonso et al., 2020), resulting in 'inconsistent pay' (Lippert et al., 2021). However, an interviewee did not experience financial difficulties, including pay cuts, as the hotel was in the pre-opening stages.

Furthermore, another interviewee was not significantly impacted with continuous live-in guests, although they did not receive salary increments. Such findings are consistent with other SL hotels, which identify no significant difficulties in paying employees (Nuskiya et al., 2020).

Furthermore, most of the interviewees indicated providing financial support to the employees (stated 76 times) by higher designations taking pay cuts to help lower income employees. Research in other SL hotels supports this with designation-based pay cuts (Samarathunga, 2020), therefore, generalizing this method around SL hotels. However, such financial impacts may reduce JS, consistent with research that identified hotel employees' reduced wages and benefits led to dissatisfaction (da Borralha et al., 2020). Ultimately, COVID-related financial issues affected hotel employees differently, encouraging further research.

Additionally, the interviewees mentioned 'COVID-related procedural changes' 328 times, the highest stated theme. Especially changes in the 'COVID-related work environment' resulting in the introduction of strict biobubbles, COVID-19 materials (e.g., masks, sanitizers), and increased COVID-19 training. Consequently, these can affect JS and WS, with findings consistent with researchers suggesting dissatisfaction and affected WS due to COVID-19 stressful working environments, strict guidelines, and procedural changes (Said & El-Shafei, 2020), plus using or failing to provide protective equipment (Wang et al., 2020). Future investigation is necessary to understand whether these factors are culturally dependent or whether other demographic factors influence these incidental findings in the SL hotel sector and worldwide. Ultimately, the results identified areas not considered or anticipated. Therefore, more research is needed to understand how factors, including COVID-related financial issues or procedural changes, impact hotel employees' JS and WS, particularly in SL.

## CONCLUSION

The purpose of this article, from a larger mixed-method project, was 'to determine whether the work stress generated by COVID-19 directly affects the job satisfaction of hotel employees in Sri Lanka'. Using a

qualitative research design and based on analysis, this article concludes that the WS generated by COVID-19 partially affects the JS of hotel employees in SL. Although the small sample limits generalizability, this research provides insight into unanticipated findings identified in the interviews, primarily COVID-related financial issues, and COVID-related procedural changes. Hotel employees and future research can use these findings as a basis to improve the understanding of financial difficulties and procedural changes in hotels throughout COVID-19 to identify how they have affected hotel employees of SL and around the world. Ultimately, this research contributes to previous findings with the addition of COVID-19 and its impact on the WS and JS of hotel employees in SL.

## REFERENCES

- American Psychological Association. (2018, October 14). Coping with stress at work. [Aa.org.  
https://www.apa.org/topics/healthy-workplaces/work-stress](https://www.apa.org/topics/healthy-workplaces/work-stress)
- Ascher-Walsh, R. (2021, September 8). The 15 best islands in the world. Travel + Leisure. <https://www.travelandleisure.com/worlds-best/islands>
- Beyer, R., Abeygunawardana, K., Kim, Y. S., Sarma, N., Prigozhina, A., Damodaran, K., Dahanayake, A., & Kliatskova, T. (2021). Economic and poverty impact of COVID-19. <https://thedocs.worldbank.org/en/doc/15b8de0edd4f39cc7a82b7aff8430576-0310062021/original/SriLanka-DevUpd-Apr9.pdf>
- Burke, R. J. (1989). Career stages, satisfaction, and well-being among police officers. *Psychological Reports*, 65(1), 3–12. <https://doi.org/10.2466/pr0.1989.65.1.3>
- Coolican, H. (2014). Research methods and statistics in psychology (6th ed., p. 330). Routledge.
- da Borralha, S., de Jesus, S. N., Pinto, P., & Viseu, J. (2016). Job satisfaction in hotel employees: A systematic review of the literature. *Journal of Spatial and Organizational Dynamics*, IV(1), 4–20.

- <https://www.jsod-cieo.net/journal/index.php/jsod/article/view/60/58>
- Demirović Bajrami, D., Terzić, A., Petrović, M. D., Radovanović, M., Tretiakova, T. N., & Hadoud, A. (2020). Will we have the same employees in hospitality after all? The impact of COVID-19 on employees' work attitudes and turnover intentions. *International Journal of Hospitality Management*, 94. <https://doi.org/10.1016/j.ijhm.2020.102754>
- Duarte Alonso, A., Kok, S. K., Bressan, A., O'Shea, M., Sakellarios, N., Koresis, A., Buitrago Solis, M. A., & Santoni, L. J. (2020). COVID-19, aftermath, impacts, and hospitality firms: An international perspective. *International Journal of Hospitality Management*, 91. <https://doi.org/10.1016/j.ijhm.2020.102654>
- Elo, S., & Kyngäs, H. (2008). The qualitative content analysis process. *Journal of Advanced Nursing*, 62(1), 107–115. <https://doi.org/10.1111/j.1365-2648.2007.04569.x>
- Howitt, D. (2010). *Introduction to qualitative methods in psychology* (1st ed., p. 428). Pearson.
- Jamal, M. (2005). Burnout among Canadian and Chinese employees: A cross-cultural study. *European Management Review*, 2(3), 225. <https://doi.org/10.1057/palgrave.emr.1500038>
- Kim, B. P., Murrmann, S. K., & Lee, G. (2009). Moderating effects of gender and organizational level between role stress and job satisfaction among hotel employees. *International Journal of Hospitality Management*, 28(4), 612–619.
- Lippert, J. F., Furnari, M. B., & Kriebel, C. W. (2021). The impact of the COVID-19 pandemic on occupational stress in restaurant work: A qualitative study. *International Journal of Environmental Research and Public Health*, 18(19), 10378.
- Loayza, N. V., & Pennings, S. (2020). *Macroeconomic policy in the time of COVID-19: A primer for developing countries*. <https://openknowledge.worldbank.org/bitstream/handle/10986/33540/Macroeconomic-Policy-in-the-Time-of-COVID-19-A-Primer-for-Developing-Countries.pdf?sequence=1&isAllowed=y>
- Locke, E. A. (1969). What is job satisfaction? *Organizational Behavior and Human Performance*, 4(4), 316. [https://doi.org/10.1016/0030-5073\(69\)90013-0](https://doi.org/10.1016/0030-5073(69)90013-0)
- Mahmood, A., Zamir, S., Ain, Q. -, Nudrat, S., & Zahoor, F. (2013). Impact of age and level of experience on occupational stress of academic managers at higher educational level. *Mediterranean Journal of Social Sciences*, 4(1), 535–541. <https://www.richtmann.org/journal/index.php/mjss/article/view/11616>
- McLeod, J. (2008). *Counselling in the workplace: A comprehensive review of the research evidence* (2nd ed.). British Association for Counselling & Psychotherapy. <https://www.bacp.co.uk/media/1974/bacp-counselling-in-workplace-systematic-review.pdf>
- Medgyesi, M., & Zólyomi, E. (2016). Job satisfaction and satisfaction in financial situation and the impact on life satisfaction. <https://ec.europa.eu/social/BlobServlet?docId=17504&langId=en>
- Mehta, M. P., Kumar, G., & Ramkumar, M. (2021). Customer expectations in the hotel industry during the COVID-19 pandemic: A global perspective using sentiment analysis. *Tourism Recreation Research*, 1–18.
- Nuskiya, M., Mubarak, K., Mufeeth, M., & Nihab, A. (2020). Covid-19 crisis and recovery of hotel industry: A strategic focus on tourism sector in Sri Lanka. *Journal of Tourism Economics and Applied Research*, 4 Special Issue, 50–59.
- Quick, J., & Henderson, D. (2016). Occupational stress: Preventing suffering, enhancing

- wellbeing. *International Journal of Environmental Research and Public Health*, 13(5).
- Rastogi, M., & Dhingra, V. (2020). Job satisfaction during COVID-19: A review of various sectors. *Psychology and Education Journal*, 57(9), 3653–3668. <http://psychologyandeducation.net/pae/index.php/pae/article/view/1519/1308>
- Said, R. M., & El-Shafei, D. A. (2020). Occupational stress, job satisfaction, and intent to leave: Nurses working on front lines during COVID-19 pandemic in Zagazig City, Egypt. *Environmental Science and Pollution Research*, 1–11.
- Samarathunga, W. (2020). Post-COVID19 challenges and way forward for Sri Lanka tourism. *SSRN Electronic Journal*.
- Sempane, M. E., Rieger, H. S., & Roodt, G. (2002). Job satisfaction in relation to organizational culture. *SA Journal of Industrial Psychology*, 28(2), 23–30.
- Sri Lanka Tourism Development Authority. (2020). *Tourism Sri Lanka volume 2*.
- Vo-Thanh, T., Vu, T.-V., Nguyen, N. P., Nguyen, D. V., Zaman, M., & Chi, H. (2020). How does hotel employees' satisfaction with the organization's COVID-19 responses affect job insecurity and job performance? *Journal of Sustainable Tourism*.
- Wang, Y., Xu, R., Schwartz, M., Ghosh, D., & Chen, X. (2020). COVID-19 and retail grocery management: Insights from a broad-based consumer survey. *IEEE Engineering Management Review*, 48(3), 202–211.
- Weerakkody, W. C. L. (2020). The impact of Covid-19 outbreak on the tourism industry in Sri Lanka. 6th National Research Conference on Applied Social Statistics, 2020, Abstract.
- Weiss, H. M., & Merlo, K. L. (2015). Job satisfaction. In *International Encyclopedia of the Social & Behavioral Sciences* (2nd ed., Vol. 12, pp. 833–838).
- Wilson, A. (2018, October 24). Sri Lanka ranked top country for travel in 2019 by Lonely Planet. *The Guardian*.
- Wong, A. K. F., Kim, S. (Sam), Kim, J., & Han, H. (2021). How the COVID-19 pandemic affected hotel employee stress: Employee perceptions of occupational stressors and their consequences. *International Journal of Hospitality Management*, 93. <https://doi.org/10.1016/j.ijhm.2020.102798>
- World Bank Group. (2020). Covid and tourism in South Asia: Opportunities for sustainable regional outcomes. [Outcomes.pdf?sequence=6&isAllowed=y](#)
- World Health Organization. (2020). Naming the Coronavirus disease (COVID-19) and the virus that causes it. *World Health Organisation*.



**2022  
SICASH**  
SLIIT INTERNATIONAL CONFERENCE ON  
ADVANCEMENTS IN SCIENCES & HUMANITIES

## **The Evaluation of ENhancing Assessment of Common Therapeutic factors – Sri Lanka (ENACT-SL) to Assess Common Factors in Counselling in Determining Therapist Competence in Sri Lanka**

Nilanga Abeysinghe<sup>1\*</sup>, Brandon Kohrt<sup>2</sup>, Ananda Galappatti<sup>3</sup>

<sup>1</sup>Sri Lanka Institute of Information Technology, Sri Lanka

<sup>2</sup> George Washington University, USA

<sup>3</sup> University of Colombo, Sri Lanka

---

### **ARTICLE INFO**

#### **Article History:**

Received Date: 01 July 2022

Accepted Date: 15 September 2022

---

#### **Keywords:**

Counselling; common factors; ENACT-SL; therapist-assessment; therapist competence

---

#### **Citation:**

Nilanga Abeysinghe, Brandon Kohrt, Ananda Galappatti. (2022). *The Evaluation of ENhancing Assessment of Common Therapeutic factors – Sri Lanka (ENACT-SL) to Assess Common Factors in Counselling in Determining Therapist Competence in Sri Lanka*. Proceedings of SLIIT International Conference on Advancements in Sciences and Humanities, (11) October, Colombo, 332 - 338.

---

### **ABSTRACT**

Counselling and psychotherapy play an essential part in mental health care. The modern field of mental health care includes many counselling modalities. Each modality consists of specific knowledge and skills. This diversity makes objective evaluation of a therapist's competence across counselling modalities challenging. The "common factors" theory claims that along with each modality's specific strengths and techniques, common factors in counselling are essential for successful counsellor–client relationships. In high-income countries, the mental health care field has developed many tools to evaluate counselling skills based on the common factors relevant to specific socio-cultural settings. Hence, the usefulness of these tools is limited to the socio-cultural backgrounds where the tools were developed. The current study evaluated the ENhancing Assessment of Common Therapeutic factors – Sri Lanka (ENACT-SL) rating scale with the participation of 68 novice and experienced counsellors who used two versions of the scale to evaluate 10-minute pre-recorded counselling sessions. The scale's reliability was assessed using Intraclass Correlation Coefficients (ICC). The ICC for inter-rater reliability was above 0.75, denoting 'good' inter-rater reliability, while the ICC for intra-rater repeatability was poor for both groups. The research findings contributed in developing

---

\* Nilanga, nilanga.a@slit.lk

a new version of ENACT-SL based on 'five domains' of counselling skills to be used in counsellor training and assessment in Sri Lanka.

## INTRODUCTION

Counselling continues to evolve within the broader mental health care and psychosocial support fields. Over the past century, many modalities of counselling with specific characteristics and strengths have evolved to help people with mental health care needs. As these modalities evolved from the early stages of modern psychology, the discussion of common factors among counselling modalities started as early as the 1930s. Rosenzweig's classic article in 1936 titled 'Some Implicit Common Factors in Diverse Methods of Psychotherapy' (reprinted in 2002) is reputed as the beginning of the common factors theory. Rosenzweig (2002) asserts that while specific therapeutic interventions are indicated in treating certain types of mental disorders, the therapist's ability to relate to the individual's needs and the particular problem situation must also be considered. Besides, evidence suggests that the common factors play an essential role in determining the therapeutic success in all modalities of counselling and psychotherapy (Wampold et al., 2002).

Sri Lanka has undergone many social changes and experiences during the post-independence, in which the contemporary field of counselling in Sri Lanka developed. Referring to the development of counselling psychology in Britain, Woolfe (2012) explains how socio, economic and political scenarios significantly influenced it. It also points out that the development of counselling and psychology fields in the United States of America (USA) was largely influenced by the social changes that followed the Second World War and the aftermath of the Vietnam War. These examples demonstrate the choices professionals had to make in establishing standards and values of the counselling field within the changing social and economic dynamics it evolved (Woolfe, 2012). These services develop in response to a country's changing social and economic conditions.

Considering the situation in Sri Lanka, the concept of mental illness prevailed for over 2000 years in Ayurvedic medicine (Neki, 1973, cited in Gambheera, 2013). However, the development of the modern mental health

sector in Sri Lanka emerged during the British colonial era and has been part of the state medical services. As a result of it, the mental health field is predominantly limited to pharmacological care and the services of clinical psychologists, counsellors and psychotherapists have gradually increased over the past two decades.

According to existing evidence, family problems and problems related to school education, including exams, are the most commonly presented problem situations for counselling (The Asia Foundation, 2015a, 2015b). In addition, the COVID pandemic has also contributed to a range of problems including the education system (Basnayake, 2021) and domestic violence that has increased during lockdowns (Wijesena et al., 2021). Along with these problems that lead people to counsellors, Sri Lanka notably has a very high suicide rate (World Health Organisation, 2018, 2019). In addition, the country is also experiencing broader social, political, economic, and well-being-related challenges.

As the counselling field is growing in Sri Lanka, many state and non-state organisations recruit and train counsellors to meet the demand. These include universities, higher educational institutions, professional bodies, and religiously affiliated organisations. However, Sri Lanka is yet to develop a standardised counsellor assessment system or minimum standards for practitioners.

In this milieu, identifying common factors (Kohrt et al., 2015a; Pedersen et al., 2020) is an attempt to contribute to counsellor competence building. The present study focuses on evaluating the ENACT-SL scale as a tool to assess and train counsellors to use common factors in counselling. ENACT-SL includes common factors mapped to 18 items based on ENACT (Kohrt et al., 2015b). The original ENACT was developed by Kohrt and colleagues (2015) in the Nepali context as the first therapist assessment tool to assess counselling competencies in a low- and middle-income country. The 18 items in the original ENACT tool were retained in the Sri Lanka version too. These factors are; 1) Non-verbal communication & Active Listening, eye contact, facial expression, body language & gestures, 2) Verbal communication skills: open-ended questions, summarising & clarifying, 3) Rapport building and self-disclosure, 4) Exploration, interpretation and normalisation of feelings, 5)



Demonstration of empathy, warmth, and genuineness, 6) Assessment of functioning and impact on life, 7) Exploration of patient's and social support network's explanation for problem, 8) Incorporation of coping mechanisms & prior solutions, 9) Assessment of patient's recent life events and acknowledgement of impact on psychosocial wellbeing, 10) Assessment of other mental health problems, alcohol/drug use and physical health problems, 11) Appropriate involvement of family members and other caregivers, 12) Collaborative goal setting and addressing patient's expectations, 13) Promotion of realistic hope for change, 14) Psycho-education incorporating local (ethnopsychological) concepts and terms, 15) Use of problem solving steps: problem formulation, Prioritisation, solution generation and action planning, 16) Elicitation of feedback when providing advice, suggestions and recommendations, 17) Explanation and promotion of confidentiality, 18) Assessment of harm to self, harm to others, harm from other and developing collaborative response plan.

The competencies identified in ENACT consist of common domains in therapist competency assessment tools developed for high-income countries and those unique to specific modalities (Kohrt et al., 2015b). This overlap suggests that the items used to evaluate therapist competence may include items that are common across societies and modalities.

The objective of the present study is to assess the effectiveness of ENACT-SL as a tool to evaluate counsellor competence in the Sri Lankan context using the common factors across modalities. Furthermore, the researchers hypothesised that the ENACT-SL three-point scale is high in reliability than the ENACT-SL five-point scale.

## METHODS

The current study is part of an extensive three-phase study. The overall study used a critical realist approach to evaluate the tool as a teaching and assessment tool. The current study focussed on tool reliability using an experimental design.

**Participants:** 68 novice and experienced counsellors participated in this study. 47 were novice counsellors, and 21 were experienced counsellors.

**Materials:** Two versions of the 18-item ENACT-SL were used for this study; a three-point Likert scale and a five-point Likert scale. These scales were used to evaluate 10-minute mock counselling sessions. The participants were allowed to use either the English or the Sinhalese versions depending on their language choice.

**Procedure:** The study allowed around 30 minutes for participants to familiarise themselves with the tool. Each participant was given a printout of the ENACT-SL with a detailed description of the scoring keys for each item and introduced three and five-point rating scales that can be used for counsellor assessment. Each group evaluated two recorded mock counselling sessions. Half of the participants in each session used the three-point Likert scale for the first round of evaluation, while the other half used the five-point Likert scale. They swapped the tools when they evaluated the second counselling session.

The recorded counselling session was projected onto a big screen for participants to observe and rate it simultaneously while allowing five extra minutes to complete the scoring. After completing the rating activities, the researcher conducted a brief feedback session by inviting participants to speak about their experiences in a group setting. Each session lasted approximately 90 -120 minutes.

The reliability of the scale was assessed using coefficient alpha (Field, 2018) and split-half reliability to test internal consistency (Green & Salkind, 2014). Also, the researcher assessed the inter-rater reliability of the ENACT-SL scale using Intraclass Correlation Coefficients (ICC) (Kohrt et al., 2015a; Koo & Li, 2016; Perinetti, 2018). This study received ethical clearance from the Ethics Review Committee (ERC) of the Faculty of Graduate Studies, University of Colombo.

## RESULTS

Internal consistency was calculated for the ENACT-SL scale using the data collected with both the three-point and the five-point Likert scales. The three-point Likert scale was used in seventy-nine (79) attempts of rating, and the five-point Likert scale was used in seventy-four (74) attempts. Results indicated high internal consistency for both scales (see table 1).

Internal consistency of the ENACT-SL three-point Likert scale was estimated using two constructs: a split-half coefficient expressed as a Spearman-Brown corrected correlation and coefficient alpha. Values for coefficient alpha was .85, and the split-half coefficient was .93, each indicating satisfactory reliability.

Internal consistency of the ENACT-SL five-point Likert scale was estimated using two

constructs: a split-half coefficient expressed as a Spearman-Brown corrected correlation and coefficient alpha. For the split-half coefficient, the ENACT-SL scale was split into two halves with nine items each. Values for coefficient alpha was .93, and the split-half coefficient was .95, each indicating satisfactory reliability.

Table 1

*ENACT-SL Reliability: Coefficient alpha and Split-half reliability scores*

Scale	Coefficient alpha	Split-half Spearman-Brown corrected correlation
ENACT-SL three-point Likert scale (Raters N 79)	.85	.93
ENACT-SL five-point Likert scale (Raters 74)	.93	.95

Repeatability analysis was performed on all other subsets of 16, 16, and 15 experienced counsellors and 21, 26, 21, and 23 novice counsellors using the 3-point and 5-point Likert scales.

The ICC for inter-rater reliability was good in all conditions (0.75 – 0.90), and the ICC's for intra-rater repeatability was poor (< 0.50) in all test conditions. There was no statistically significant difference between the three-point and five-point Likert scales or the novice and experienced groups.

Table 2

*Inter-Rater Reliability and Intra-Rater Repeatability*

Group	N	Inter-rater reliability (Average measure)	Intra-rater repeatability (Single measures)
Experienced counsellor group: Session 2: 3-point Likert scale	16	Good 0.81 (0.75 – 0.90)	Poor 0.23 (< 0.50)
Experienced counsellor group: Session 2: 5-point Likert scale	16	Good 0.80 (0.75 – 0.90)	Poor 0.20 (< 0.50)
Experienced counsellor group: Session 3: 3-point Likert scale	15	Good 0.81 (0.75 – 0.90)	Poor 0.27 (< 0.50)
Novice counsellor group: Session 2: 3-point Likert scale	21	Good 0.87 (0.75 – 0.90)	Poor 0.23 (< 0.50)
Novice counsellor group: Session 2: 5-point Likert scale	26	Good 0.83 (0.75 – 0.90)	Poor 0.19 (< 0.50)
Novice counsellor group: Session 3: 3-point Likert scale	21	Good 0.77 (0.75 – 0.90)	Poor 0.14 (< 0.50)
Novice counsellor group: Session 3: 5-point Likert scale	23	Good 0.78 (0.75 – 0.90)	Poor 0.13 (< 0.50)

## DATA ANALYSIS AND DISCUSSION

The results indicate that the internal consistency of both three-point and five-point Likert scales was satisfactory, as displayed by the split-half coefficient expressed as a Spearman-Brown corrected correlation ( $<0.80$ ) and the coefficient alpha ( $<0.90$ ) (Green & Salkind, 2014). Existing studies show that these scores for internal consistency are on par with therapist assessment scales currently available (Brown, 2011; Cahill et al., 2008; Cahill et al., 2012). These results indicate that the ENACT-SL scale is reliable in measuring the therapist's competency to use the identified 18 common factors in the Sri Lankan context.

The ENACT-SL three-point and five-point scales have inter-rater reliability scores between 0.75 and 0.90, which is considered a 'good reliability' (Field, 2005a). The reliability scores indicate that the average test scores for both the three-point and five-point scales are reliable. However, the intra-rater repeatability for both scales was between 0.10 – 0.30, indicating single measures reliability to be in the 'poor' ( $>0.50$ ) range. Therefore, according to Field (2005a), the current study results suggest that using the ENACT-SL by a single evaluator may not yield reliable results. Nevertheless, the reliability could be improved by increasing the number of evaluators as the average test scores for the tool demonstrates a 'good reliability.'

The study results further show that the intra-rater repeatability scores tend to increase with experienced counsellors (0.27 using the three-point Likert scale) compared to novice counsellors (0.14 using the three-point Likers scale). Contemporary studies in multi-country sites show that intra-rater repeatability scores increase when participants receive brief training on the ENACT tool for approximately five days (Watts et al., 2021). Thus, the initial low intra-rater repeatability is on par with the results from other studies, and the participants in other sites have shown positive results.

According to these findings, the researchers accept the null hypothesis denoting the possibility to use both the three-point and five-point Likert scales. However, the researchers recommend to conduct future studies consisting of short training programmes to test the intra-rater repeatability of the tool following such trainings. Considering the present study results, differences in exposure

to the constructs of ENACT-SL may have contributed to the intra-class reliability scores between the experienced and novice counsellors. The critical realist worldview explains this with the concepts of generative mechanisms (Blom & Moren, 2011; Schiller, 2016), discussing how multiple counteractions affect an outcome. Thus, prior knowledge and skill development exposure may have contributed to the differences, although these underlying factors cannot be observed or evaluated through a brief experimental design.

## CONCLUSION

Considering the feedback from participants and the study results, the researchers categorised the 18 factors of ENACT-SL into 1) Communication, 2) Emotional engagement, 3) Social relations, 4) Assessment and 5) Planning and process (Pedersen & Kohrt, 2019). Assessing the validity and reliability of this newly developed tool is an essential step in establishing the usefulness of ENACT-SL that emerged from the current study.

The researchers suggest future work to include an action research component within the critical realism paradigm to overcome the limitations resulting in discrepancies between the 'empirical domain' and the 'actual domain' of critical realism. This approach will allow researchers to study the contribution of common factors in counselling without being limited by the positivist approach. These studies could focus on specific factors and domains of common factors, allowing future researchers to assess the internal consistency of these factors within domains while even identifying new domains that constitute ENACT-SL.

## REFERENCES

- Basnayake, B. M. R. H. K. (2021). The ideological basis for linking social and emotional learning with Sri Lankan University education during the Corona epidemic. SLIIT International Conference on Advancement of Sciences and Humanities, Malabe.
- Blom, B., & Moren, S. (2011). Analysis of generative mechanisms. *Journal of Critical Realism*, 10(1), 60-79.

- Brown, R. (2011). The development of the common factor therapist competence scale for youth psychotherapy [text, Virginia Commonwealth University]. Networked Digital Library of Theses & Dissertations. Richmond, Virginia
- Cahill, J., Barkham, M., Hardy, G., Gilbody, S., Richards, D., Bower, P., & Connell, J. (2008). A review and critical appraisal of measures of therapist-patient interactions in mental health settings. *Health Technology Assessment*, 12(24), 147-149.
- Cahill, J., Stiles, W. B., Barkham, M., Hardy, G. E., Stone, G., Agnew-Davies, R., & Unsworth, G. (2012). Two short forms of the Agnew Relationship Measure: The ARM-5 and ARM-12. *Psychotherapy Research*, 22(3), 241-255.
- Field, A. P. (2005a). Intraclass correlation. In B. Everitt & D. C. Howell (Eds.), *Encyclopedia of Statistics in Behavioral Science* (Vol. 2). Wiley.
- Field, A. P. (2018). *Discovering Statistics using IBM SPSS Statistics* (5 ed.). SAGE Publications.
- Green, S. B., & Salkind, N. J. (2014). *Using SPSS for Windows and Macintosh: Analyzing and Understanding Data*. Pearson Education.
- Kohrt, B. A., Jordans, M. J. D., Rai, S., Shrestha, P., Luitel, N. P., Ramaiya, M. K., Singla, D. R., & Patel, V. (2015a). Therapist competence in global mental health: Development of the enhancing assessment of common therapeutic factors (ENACT) rating scale. *Behaviour Research and Therapy*, 69, 11-21.
- Kohrt, B. A., Ramaiya, M. K., Rai, S., Bhardwaj, A., & Jordans, M. J. D. (2015b). Development of a scoring system for non-specialist ratings of clinical competence in global mental health: A qualitative process evaluation of the ENhancing Assessment of Common Therapeutic Factors (ENACT) scale. *Global Mental Health*, 2.
- Koo, T. K., & Li, M. Y. (2016). A guideline of selecting and reporting intraclass correlation coefficients for reliability research. *Journal of Chiropractic Medicine*, 15(2), 155-163.
- Pedersen, G. A., & Kohrt, B. A. (2019). ENhancing Assessment of Common Therapeutic Factors (ENACT): Adapted for use in WHO Ensuring Quality in Psychological Support (EQUIP) Platform.
- Pedersen, G. A., Lakshmin, P., Schafer, A., Watts, S., Carswell, K., Willhoite, A., Ottman, K., van't Hof, E., & Kohrt, B. A. (2020). Common factors in psychological treatments delivered by non-specialists in low- and middle-income countries: Manual review of competencies. *Journal of Behavioral and Cognitive Therapy*, 30(3), 165-186.
- Perinetti, G. (2018). Sta Tips Part IV: Selection, interpretation and reporting of the intraclass correlation coefficient. *South Eur J Orthod Dentofac Res*, 5(1), 3-5.
- Schiller, C. J. (2016). Critical realism in nursing: An emerging approach. *Nursing Philosophy*, 17, 88-102.
- The Asia Foundation. (2015a). Mapping Study of the Work and Capacity of Counselling Assistants of the Ministry of Child Development and Women's Affairs.
- The Asia Foundation. (2015b). Mapping Study of the Work and Capacity of the Counselling Assistants of the Ministry of Social Services and Counselling Officers of the Ministry of Child Development and Women's Affairs.
- Wampold, B. E., Lichtenberg, J. W., & Waehler, C. A. (2002). Principles of empirically supported interventions in counseling psychology. *Counseling Psychologist*, 30(2), 197.
- Watts, S., Hall, J., Pedersen, G. A., Ottman, K., Carswell, K., van't Hof, E., Kohrt, B. A., & Schafer, A. (2021). The WHO EQUIP foundational helping skills trainer's curriculum. *World Psychiatry*, 20(3), 449-450.
- Wijesena, V., De Zoysa, P., Iqbal, I., Randombage, Y., & Gunasekara, M. (2021). Preventing Violence Against Women During

- COVID-19: A Qualitative Study Done in Sri Lanka,. SLIIT International Conference on Advancement of Sciences and Humanities, Malabe.
- World Health Organisation. (2018). Crude Suicide Rates (per 100000 population) World Health Organisation. Retrieved 04.02.2021 from
- Woolfe, R. (2012). Risorgimento: A history of counselling psychology in Britain. *Counselling Psychology Review*, 27(4), 72-78.
- World Health Organisation. (2019). Suicide in the World: Global Health Estimates. World Health Organisation.



## Siblings of Children with Autism Spectrum Disorder: Behavioural and Emotional adjustment and the Influence of Family Factors on Adjustment

\*<sup>1</sup>M.J. Thilakshi Fernando

<sup>1</sup>Sri Lanka Institute of Information Technology, Sri Lanka

---

### ARTICLE INFO

#### Article History:

Received Date: 01 July 2022

Accepted Date: 15 September 2022

---

#### Keywords:

Autism Spectrum Disorder; Siblings; Behavioral and Emotional Adjustment; Family Factors

---

#### Citation:

M.J. Thilakshi Fernando. (2022). *Siblings of Children with Autism Spectrum Disorder: Behavioural and Emotional adjustment and the Influence of Family Factors on Adjustment*. Proceedings of SLIIT International Conference on Advancements in Sciences and Humanities, (11) October, Colombo, 339 - 346.

---

### ABSTRACT

Children with Autism Spectrum Disorder (ASD) have unique characteristics, which are expected to have an impact on members of the family. However, research concerning the effects of ASD on family members has focused predominantly on ASD's impact on parents and less on its impact on siblings, especially in the context of Sri Lanka. This research attempts to address this gap and advance the understanding of the Behavioral and Emotional (B&E) adjustment of siblings of children with ASD. The study utilized a quantitative research design using a sample of 80 mothers of children with ASD, selected using convenient sampling from hospitals and institutions located in the Colombo and Gampaha districts. Mothers completed a Demographic Questionnaire, Socio-Economic Status Questionnaire, Parental Stress Scale, and Strength and Difficulties Questionnaire. The study found that B&E adjustment of the majority of the siblings was within the 'Normal' range (54%), which shows that siblings were well adjusted behaviorally and emotionally. However, closer to half of the siblings (46%) either had a risk (i.e., scored within the 'Borderline' range) or were experiencing adjustment difficulties (i.e., scored within the 'Abnormal' range). When siblings were analyzed according to the domains of the SDQ, the majority scored within the 'Borderline' range for peer problems, which indicates that siblings are at risk for peer problems. Additionally, the study found that out of all the selected family factors, Maternal

---

\* Thilakshi, thilakshi.f@slit.lk

Stress due to rearing a child with ASD and ASD severity was positively associated with sibling B&E adjustment difficulties.

## INTRODUCTION

Researchers first became interested in investigating siblings of children with a disability after the advances in the legal rights and status of children with handicaps in the 1970s. This changed how children with a disability were treated within the school and community settings, allowing them to be integrated back into the family system and schools from being institutionalized and harassed (Jacob & Hartshorne, 2007; McHale, Sloan, & Simeonsson, 1986). As a result, researchers had to investigate the impact of the presence of a child with a disability on the entire family. However, the majority of this early research focused on the effects of having a child with a disability on the parents' well-being. It was only after recognizing the unique role of siblings in their other siblings' growth and development that researchers began to become interested in the impact of the disability on the typically developing (TD) sibling's adjustment (Chan, 2011).

Previous researchers have found that when a child in the family is diagnosed with a disability, the adjustment of other children in the family could be influenced (Davis, 2010). Although siblings of children with a Developmental Disabilities (DD) are likely to be influenced, past research has found that siblings of children with Autism Spectrum Disorder (ASD) are more likely than siblings of children with other DD and the general population to have adjustment difficulties (Carvalho, 2017; Green, 2013; Wright, 2018). The majority of research has shown that there is an increased risk for siblings of children with ASD, in terms of behavioral adjustment (characterized by external difficulties and is observed as distress directed towards others and including hyperactivity/inattention, and conduct problems) and emotional adjustment (characterized by internal difficulties and is observed as depression, anxiety, somatic complaints, and isolation) (Petalas et al., 2009; Sambatha, 2016).

Sambatha (2016) reported that siblings of children with ASD are at increased risk for B&E problems compared to siblings of TD children due to increased complications, such as

aggression, mixed feeling, internalization/externalization of emotions, and overall feelings of responsibility and concern for the ASD sibling. Tudor et al. (2018) discovered that as siblings miss out on extra attention and affection from parents, who give selectively more attention to the child with ASD, siblings are more likely to take some of the disruptive behaviors of their sibling with ASD in attempts to regain that affection and redirect the parental attention. Chan & Goh (2014) confirmed that siblings complained about unfair treatment in the family due to 'double-standard parenting' where mothers were laxer towards the misbehavior of the child with ASD. Siblings with a brother/sister with ASD may also be at an increased risk for problems in B&E adjustment due to increased parental expectations, brother/sister with ASD being physically aggressive, restricted opportunities for social interactions, and self-imposed need to over-achieve to compensate for their ASD sibling's deficiencies (Barak-Levy et al., 2010; Gerfin, 2014; Lovell & Wetherell, 2016). These adjustment difficulties during the period of childhood and adolescence can increase the risk for mental health problems and can significantly impact siblings' ability to function at home and school, as well as increase the risk for the issues in adjustment persisting into adulthood (Gerfin, 2014).

Despite the research indicating negative impacts on adjustment, findings across previous studies have also proven that outcomes for adjustment of siblings of individuals with ASD are equivocal, where positive or no effects on adjustment were also observed (Hastings, 2007; Petalas et al., 2009a). For instance, Petalas et al. (2009b) and Mack & Reeve (2007) found that siblings tend to show greater empathy, stress tolerance, and dexterity in self-control strategies. Even though increased responsibility experienced by siblings is associated with negative outcomes, recent evidence suggests that it may result in positive outcomes for siblings, especially for sisters but only when ASD symptomatology is relatively mild (Tomeny et al., 2016). It was also found that siblings were more likely to pursue 'caring professions' as an adult (Cantwell & Baker, 1984 as cited in Murray, 2013). In fact, the presence of one sibling with a disability compared to several has been correlated with more positive affects in some investigations (Aiden & Ittel, 2014).

Based on the above literature it can be succinctly concluded that having a brother or sister with ASD may not itself be a risk factor for the development of sibling adjustment problems (Green, 2013). According to Siblings Embedded System Framework (Kovshoff et al., 2017), a number of sibling factors and factors at the Microsystem and Mesosystems, Exosystems, and Macrosystem level contribute to sibling adjustment. However, the present study focuses on microsystem and mesosystems level factors, in particular family factors, as researchers and practitioners have identified the importance of family context in predicting sibling development and adjustment (Davis, 2010; Gerfin, 2017; Giallo & Gavindia-Payne, 2006). The very few studies which have exclusively explored B&E psychosocial adjustment of siblings of individuals with ASD concluded that the siblings were well adjusted under optimal environmental conditions, such as the absence of maternal stress, larger family size, and presence of high-functioning ASD in siblings (Kaminsky & Dewey, 2002). Similarly, research indicates that factors such as the mother's age, gender and age of the child with ASD, the presence of another child with DD in the family, and the number of siblings in the family may influence the B&E adjustment of siblings (Aparicio & Minguez, 2015; Benson & Karlof, 2007; Macks & Reeve, 2007; Meyer et al., 2011; Seltzer & Orsmond, 2009).

Since recently a growing number of research conducted in both Western and Non-Western Countries have documented the impact on siblings' B&E adjustment (Chan & Lai, 2016; Gau et al., 2010; Pourbagheri et al., 2018). However, from the researcher's best knowledge no such published research exists, which has investigated the impact on B&E adjustment of siblings of children with ASD in the context of Sri Lanka. Given that the prevalence of ASD is alarmingly high in Sri Lanka (Perera et al., 2009), and that siblings of children with ASD may be at a greater risk for B&E problems based on previous literature, it is important to explore the topic in the context of Sri Lanka. Therefore, this study aimed to fill this gap in knowledge by exploring the B&E adjustment of siblings whose brother/sister with ASD is attending hospitals and special needs institutes in the Colombo and Gampaha Districts of Sri Lanka.

The objective of the present study is to determine whether siblings of children with

ASD are at risk for B&E adjustment, and to determine whether there is a relationship between selected family factors and siblings' B&E adjustment. The researcher hypothesized that siblings are at risk of B&E adjustment problems (Hypothesis 01) and that there is a relationship between siblings' B&E adjustment and the selected family factors (Hypothesis 02).

## METHOD

**Research design** A quantitative research design using the cross-sectional survey research method was adopted for the study.

**Research participants:** The participants were 80 mothers of siblings drawn using the convenient sampling method from research settings located in the Colombo and Gampaha districts. As mothers tend to be the primary caregiver of children and adolescents in Sri Lanka (Ellawella, Fonseka, & Kaththiriarachi, 2015), especially for children with disabilities (Monika et al., 2017), mothers were chosen as the only participants and parental respondents. The population size was calculated based on experts' advice, as there were no published studies to date that have estimated the prevalence of siblings aged 4-17 years of individuals with ASD or other developmental disabilities in Western (Tudor & Lerner, 2015) or Non-western countries. The sample size was calculated using the formulae of Krejcie and Morgan (1970). Inclusion criteria were mothers (1) of families with a child with ASD aged ranging from 2-18 years (2) with at least one other child aged ranging from 4-17 years with no past or current psychiatric/medical illness, and attending a mainstream school, (3) visiting hospitals and special need institutions in the Colombo and Gampaha district (4) who were able to understand either English or Sinhala (5) from Sri Lanka.

**Research Instruments** The data was obtained in terms of four questionnaires administered together based on their sensitivity: Demographic questionnaire (DQ), Socio-economic Status Questionnaire (SESQ), Parental Stress Scale (PSS) (Berry & Jones, 1995), and Strength and Difficulty Questionnaire (SDQ) (Goodman, 1997).

1. DQ The DQ was used to assess the demographic characteristics of mothers, siblings, and children with ASD.

2. SESQ SESQ is a self-constructed questionnaire adapted from Godamunne et al.



(2015), which was used to assess Family Socio-Economic Status.

3. PSS PSS was used to assess MS associated with bringing up a child with ASD. PSS is a brief 18-item self-reported scale scored on a five-point Likert scale ranging from strongly agree (1) to strongly disagree (5). The Sinhalese version of PSS has adequate test-retest reliability with satisfactory psychometric properties (Godammune et al., 2014).

4. SDQ SDQ was used to assess the B&E adjustment of siblings. It is a 25-item questionnaire based on a three-point Likert scale and consists of five subscales. Factor structure and internal consistency of the Sinhala version of the SDQ have been reported to be satisfactory, although it has not been published (Prior et al., 2005). More recently, Perera, Thalagala, Chandrarathna, and Agampodi (2013) concluded that internal consistency (Chronbach's Alpha) for total difficulties was satisfactory ( $>0.71$ ), although the Chronbach's Alpha for all five subscales was less than six.

Procedure The research gained approval from the Ethical Review Committee (Faculty of Graduate Studies) and thereafter obtained permission to collect data from selected hospitals and special needs institutes in the Colombo and Gampaha districts. Permission from the settings was obtained either based on the recommendations given by the ERC, FGS or through submission of the research proposal to settings where such committees were present. The data collection of the study was conducted for a duration of 5 months. Participants were recruited from (1) hospital settings while in the waiting room of the respective clinics and (2) institutions during parent meetings or while

they were in the waiting room. Mothers were briefed about the topic. The ones who wished to participate were provided with the set of questionnaires, which consisted of a participant information sheet, consent forms, and the four questionnaires. After each data collection session ended, participants and institutions were thanked for their cooperation, a leaflet was distributed, and its content was briefed. Each questionnaire was checked to see whether there were any missing values. Of the 95 sets of questionnaires returned, 15 were discarded because they were incorrectly filled. As a result, 80 sets of questionnaires were properly completed. The data were inputted into a database using IMB SPSS software, version 23.0. Prior to data analysis, the entered data were filtered and a random checking was carried out.

Data analysis Data were analyzed using descriptive and inferential statistics using SPSS 23.0. The data were analyzed using non-parametric tests as the sample did not meet the parametric assumptions. Descriptive statistics were run to test the first hypothesis which focused to determine if siblings' were at risk for B&E adjustment. Several individual Spearman rank-correlations and Chi-square tests of independence were conducted to test the second hypothesis to determine the relationship between selected family factors and siblings' B&E adjustment. The choice of spearmen ranked-correlations and Chi-square tests of independence to test the second hypothesis was because the levels of measurements of the variables were either ordinal and scale or two ordinals.

## RESULTS AND DISCUSSION

### Sibling's Behavioural and Emotional Adjustment

Descriptive analysis was carried out to test the first hypothesis, which hypothesized that siblings are at risk of B&E adjustment problems, as shown in Table 1.

Table 1

SDQ	SDQ	SDQ	SDQ Peer	SDQ	SDQ Total
Emotional Problems	Conduct Problems	Hyperactivity	Problem	Prosocial Behaviour	difficulties
<b>N (%)</b>	<b>N (%)</b>	<b>N (%)</b>	<b>N (%)</b>	<b>N (%)</b>	<b>N (%)</b>

Normal	50 (62.5)	46 (57.5)	54 (67.5)	36 (45)	44 (55)	43(53.8)
Borderline	13 (16.3)	16 (20)	9 (11.3)	7 (8.8)	11 (13)	9(11.2)
Abnormal	17 (21.3)	18 (22.5)	17 (21.3)	37 (46.3)	25 (31.3)	28(35.0)

Note. Data presented is as frequency (percentage). It should be noted that the term SDQ total difficulties refers to B&E adjustment, and it is the sum of conduct problems, emotional symptoms, hyperactivity/inattention, and peer relationship problems.

The majority of mothers reported that siblings' B&E adjustment fell under the 'normal' category (53.8%) while the remaining mothers reported that 11.2% and 35% of siblings fell under the 'borderline' and 'abnormal' categories respectively. This indicates that most siblings of children with ASD were well-adjusted behaviourally and emotionally. Therefore, the first hypothesis, which states that siblings are at risk of B&E adjustment problems, is not supported by the present study findings. Despite the majority of the siblings falling within the 'Normal' category for B&E adjustment problems, closer to half of the siblings (46%) either had a risk (i.e., scored within the 'Borderline' range) or were experiencing adjustment difficulties (i.e., scored within the 'Abnormal' range). A similar observation to the study findings using the SDQ was reported in a study by Davis (2010). The certainty that sample siblings were well adjusted implies that the focal mechanism for sibling outcome may not solely be the ASD but a number of other factors at the individual, family, and community levels (Green, 2013). This highlights the importance of identifying the factors associated with healthy B&E adjustment outcomes as they can be incorporated into interventions that focus on improving siblings' adjustment outcomes.

To further understand B&E adjustment, scores on the SDQ were analyzed according to the four problem domains (i.e. emotional problems, conduct problems, hyperactivity, and peer relationship problems) and strength domain (i.e. prosocial behaviour). The results showed that the majority of the siblings' emotional problems, conduct problems, hyperactivity, and prosocial behaviour fell under the 'normal' category. However, the majority of mothers reported that siblings' peer problems fell under the 'abnormal' category (46.3%). The findings are noteworthy as the findings may go in line with the concept of

Broad Autism Phenotype (BAP), where these concerns reflect subtle Autistic difficulties (such as social difficulties) due to their genetic predisposition. Some research indicates that other aspects affect siblings' social behaviour, such as increased parental sensitivity or expectation about siblings' social competency, or feeling stigmatized as a result of having a brother/sister with ASD (Petalas, 2009; Chan & Lai, 2016). Consequently, poor social adjustment in siblings can negatively influence the social competency of the individual with ASD (Carvalho, 2017).

#### Siblings' Behavioral and Emotional Adjustment and Family factors

To examine hypothesis 2, which states that there is a relationship between siblings' B&E adjustment and the selected family factors, seven individual Spearman rank-order correlations and two separate chi-square tests of independence were carried out. The potential demographic variables of interest for the researcher were MS, SES, mother's age, number of children in the family, presence of another child/children with developmental disability and number of adults taking care of the child with ASD, and the characteristics of a child with ASD, including age, gender, birth order, and severity.

There was no significant association between B&E adjustment and SES ( $r_s(78) = -.111, p > .05$ ), mother's age ( $r_s(78) = -.073, p > .05$ ), number of children in the family ( $r_s(78) = .100, p > .05$ ), presence of more than one child with a developmental disability ( $r_s(78) = .120, p > .05$ ), number of adults taking care of the child with ASD ( $r_s(78) = .11, p > .05$ ), and age of the child with ASD ( $r_s(78) = -.022, p > .05$ ). However, a corresponding two-tailed test of significance indicated that siblings' B&E adjustment was positively associated with MS ( $r_s(78) = .491, p < .05$ ) and severity of the child with ASD ( $r_s(78) = .247, p < .05$ ). Additionally, the two separate chi-square tests showed that there was no

association between gender and B&E adjustment,  $\chi^2(2, N=80)=1.16, p>.05$ , and no association between birth order and B&E adjustment,  $\chi^2(2, N=80)=1.46, p>.05$ . Since two of the selected family factors (MS and severity of the child with ASD) were associated with B&E adjustment, it can be concluded that the findings partially support the second hypothesis of the present study.

The relationship between MS and B&E adjustment aligns with the findings of Davis (2010) and Petalas et al (2012). Hannah & Midlarsky (1985) and Peter (2007) noted that a high level of stress in mothers might reduce mothers' involvement with their siblings compared to the child with ASD, which may result in the needs of siblings being unrecognized, ignored, or misunderstood while at the same time increasing mothers' expectations about siblings. MS can indirectly impact siblings, as stress results in reduced ability for parents to regulate emotions and model appropriate behaviours (Tomeny, 2015). Consistent with the research findings, symptom severity of children with ASD has been found to positively relate to the adjustment difficulties in siblings (Meyer et al., 2011). This is mostly due to the sibling being directly exposed to an ASD child's aggressive behaviours, feelings of embarrassment, and difficulties explaining the disability (Meyer et al., 2011).

## CONCLUSION

### Sibling's Behavioral and Emotional Adjustment

Considering the findings of the current study, it can be concluded that the majority of siblings of children with ASD are well-adjusted behaviourally and emotionally, but there are still a proportion of siblings who are either at risk or experiencing adjustment difficulties. The findings of the study support the idea that factors underlying healthy B&E adjustment outcomes need to be identified in order to incorporate them into interventions that focus on improving siblings' adjustment outcomes. Given that a proportion of the population is likely to exhibit problems in adjustment, although the majority of the siblings were well adjusted, it is still important to address the needs of siblings by providing an assessment of their needs and evidence-based interventions. The study also found that most siblings had a risk for peer problems. These findings,

therefore, highlight the need for researchers to focus on investigating the social adjustment of siblings and to design interventions based on this need.

### Sibling's Behavioral and Emotional Adjustment and Family Factors

Although some previous studies only conceptualize the presence of a child with ASD as a primary contributing factor that is particularly impacting sibling adjustment, the study findings infer that the focal mechanism for sibling outcome may not solely be the ASD but several factors at the family level. The findings underscore that family characteristics, such as MS and the severity of ASD, predominantly impact the siblings' B&E adjustment. Hence, these may be important factors to consider when examining sibling outcomes and designing necessary interventions that focus on the brother/sister with ASD and the mothers. Although the research was unable to find a link between B&E adjustment and several other selected family demographic factors, these findings are still of paramount importance as they imply the presence of several moderating factors influencing the relationship between the links. As several factors result in siblings' adjustment problems, researchers must be cautious when concluding on the adjustment of siblings of children with ASD as it could inadvertently send the message that the child with ASD is the root cause for adjustment difficulties.

## LIMITATIONS

The main limitation of the study is that it was based on mothers' reports only. Although it would have been more advantageous for fathers and siblings to participate in the study, they were not considered as informants due to practical difficulties. Another limitation is that even though the study instruments had adequate internal consistency or test-retest reliability, these questionnaires could have decreased the reliability of results due to social desirability, or due to misinterpretation or misunderstanding of items on the questionnaire (Yau, 2011). Although the present study paid attention to the fact that some siblings may be at heightened genetic risk for developing ASD or related disorders by screening for the presence of psychological or medical diagnosis, the lack of an independently

verified diagnostic classification of siblings is still considered as a limitation of the study. These limitations may have impacted the results of the study.

## IMPLICATION AND RECOMMENDATIONS

The findings of the study have several important implications and recommendations for developing policies, research, theories, and designing interventions for the siblings of the child with ASD and their families. The study findings imply that siblings could be at risk for or maybe already experiencing problems in B&E adjustment, thus highlighting the importance for parents and professionals to monitor and assess the adjustment and functioning of siblings to ensure they receive appropriate support and interventions. The study finding also emphasize the need for the development of mental health policies in Sri Lanka relating to siblings so that siblings receive appropriate services. As the present study findings indicate the contribution of family factors in compromising adjustment, further investigations must be carried out (1) to determine the family factors that contribute to siblings experiencing better or worse adjustment outcomes and (2) to continue developing comprehensive family models to better understand the impact of the entire family system on siblings in families with a child with ASD. Finally, the methodological issues that have been raised in the limitation of the present study need to be considered in future research investigating the adjustment of siblings of children with ASD.

## ACKNOWLEDGMENT

The author wishes to thank everyone for their invaluable contribution and feedback to the present study.

## REFERENCES

American Psychiatric Association. (2014). Autism Spectrum Disorder. <https://www.psychiatry.org/patients-families/autism/what-is-autism-spectrum-disorder>

Aparicio, R.R. & Minguez, R.T. (2015). Behavioral, Emotional and Social Adjustment in Siblings of Children with

Autism Spectrum Disorder: A Theoretical Review. *Papeles del Psicólogo*, 36(3), 189-197.

Barak-Levy, Y., Goldstein, E., and Weinstock, M. (2010). Adjustment characteristics of healthy siblings of children with autism. *Journal of Family Studies*, 16, 155-164.

Carvalho, M. J. (2017). Living with a Sibling who has Autism Spectrum Disorder.

Chan, J. Y., & Lai, K. Y. (2016). Psychological Adjustment of Siblings of Children with Autism Spectrum Disorder in Hong Kong. *East Asian Arch Psychiatry*, 6(4), 141-7.

Davis, K. E. (2010). The Psychological Adjustment of Siblings of Children with Disabilities: The Role of the Family and the Wider Social Community.

Gau, S., Chou, M., Lee, J., Wong, C., Chou, W., & Chen, M. et al. (2010). Behavioral problems and parenting style among Taiwanese children with autism and their siblings. *Psychiatry And Clinical Neurosciences*, 64(1), 70-78.

Gerfin, R. (2014). The social and emotional adjustment of siblings of children with disabilities (Project (M.S. Ed.). The State University of New York at Fredonia.

Giallo, R., & Gavidia-Payne, S. (2006). Child, parent, and family factors as predictors of adjustment for siblings of children with a disability. *Journal of Intellectual Disability Research*, 50(12), 937-948.

Godamunne, P.K.S., Pathmeswaran, A, Samankula, D. & Samarasinghe, G. (2014). Psycho-social factors associated with parental stress among parents of children with autism, cerebral palsy and Down syndrome in Sri Lanka: A Qualitative Study. *Proceedings of the Annual Research Symposium 2012, Faculty of Graduate Studies, University of Kelaniya*, 147.

Goodman, A., Lamping, D. L., & Ploubidis, G. B. (2010). When to Use Broader Internalising and Externalising Subscales Instead of the Hypothesised Five Subscales on the Strengths and Difficulties Questionnaire

- (SDQ): Data from British Parents, Teachers, and Children. *Journal of Abnormal Child Psychology*, 38(8), 1179–1191.
- Green, L. (2013). The Well-Being of Siblings of Individuals with Autism. *ISRN Neurology*, 2013, 1–7.
- Hastings, R. P. (2007). Longitudinal Relationships Between Sibling Behavioral Adjustment and Behavior Problems of Children with Developmental Disabilities. *Journal of Autism and Developmental Disorders*, 37(8), 1485–1492.
- Jacob, S., & Hartshorne, T. S. (2007). *Ethics and law for school psychologists* (5th ed.) John Wiley & Sons Inc.
- McHale, S. M., Sloan, J., & Simeonsson, R. J. (1986). Sibling relationships of children with autistic, mentally retarded, and nonhandicapped brothers and sisters. *Journal of Autism and Developmental Disorders*, 16, 399–413.
- Meyer, K., Ingersoll, B., & Hambrick, D. (2011). Factors influencing adjustment in siblings of children with autism spectrum disorders. *Research In Autism Spectrum Disorders*, 5(4), 1413–1420.
- Opperman, S., & Alant, E. (2003). The coping responses of the adolescent siblings of children with severe disabilities. *Disability and Rehabilitation*, 25(9), 441–454.
- Perera, H., Wijewardena, K., & Aluthwelage, R. (2009). Screening of 18-24-Month-Old Children for Autism in a Semi-Urban Community in Sri Lanka. *Journal Of Tropical Pediatrics*, 55(6), 402–405.
- Petalas, M. A., Hastings, R. P., Nash, S., Dowey, A., & Reilly, D. (2009a). "I Like That He Always Shows Who He Is": The perceptions and experiences of siblings with a brother with an autism spectrum disorder. *International Journal of Disability, Development, and Education*, 56(4), 381–399.
- Petalas, M. A., Hastings, R. P., Nash, S., Lloyd, T., & Dowey, A. (2009b). Emotional and behavioral adjustment in siblings of children with intellectual disability with and without autism. *Autism*, 13(5), 471–483. DOI: 10.1177/1362361309335721
- Pourbagheri, N., Mirzakhani, N., & Akbarzadehbaghban, A. (2018). A Comparison of Emotional-Behavioral Problems of Siblings at the Age Range of 3-9-Year-Old Children with Autism and Down Syndrome. *Iranian journal of child neurology*, 12(2), 73–82.
- Prior, M., Virasinghe, S., & Smart, D. (2005). Behavioral problems in Sri Lankan schoolchildren. *Social Psychiatry And Psychiatric Epidemiology*, 40(8), 654–662.
- Sambatha, S. (2016). Examining the Psychological Adjustments of Neurotypical Siblings of Individuals with Autism Spectrum Disorder (ASD) and Determining the Efficiency of Support Group (Undergraduate Research Posters). Virginia Commonwealth University.
- Wright, J. (2018, October 10). Siblings of children with autism have social and emotional problems. Mount Sinai. "Siblings Of Children With Autism Have Social, Emotional Problems" -Jessica Wright | Mount Sinai - New York



## Attitude of Police Officers towards Dealing with Individuals with Psychological Problems: A Sample from Selected Police Stations in Colombo District

Leila Tennakoon<sup>1\*</sup>, Lakmal Ponnampuruma<sup>2</sup>

<sup>1</sup>Department of Psychology, Kaatsu International for Undergraduate Studies, Battaramulla

<sup>2</sup>Director, Psycho-Social Division, National Child Protection Authority

### ARTICLE INFO

#### Article History:

Received Date: 01 July 2022

Accepted Date: 15 September 2022

#### Keywords:

Police; law enforcement; attitude; mental health; psychological problems

#### Citation:

Leila Tennakoon, Lakmal Ponnampuruma. (2022). *Attitude of Police Officers towards Dealing with Individuals with Psychological Problems: A Sample from Selected Police Stations in Colombo District*. Proceedings of SLIIT International Conference on Advancements in Sciences and Humanities, (11) October, Colombo, 347 - 353.

### ABSTRACT

Sri Lanka's Mental Diseases Ordinance (1873) gives discretion to police officers to make decisions concerning individuals who live with mental health conditions despite lack of clinical training. Identification of officers' attitudes towards individuals with psychological problems (IPPs) is important as these influences officers' responses to situations involving IPPs. Using the Mental Health Attitude Survey for Police (MHASP; Clayfield, 2011), the study aimed to identify police officers' attitudes towards IPPs, on the community responsibility towards IPPs and on IPPs living in the community. Officers' perceived level of adequacy to deal with IPPs was also assessed. Literature indicates that factors such as age, gender, level of education, years of experience, personal experience with an IPP and past training predicted officers' attitude, the current study investigated the same. The survey was distributed amongst 77 officers who volunteered on site. MHASP includes 33 statements of officers rated their level of agreement using a Likert scale. MHASP Total an overall attitude score ( $M=132.67$ ,  $SD=17.55$ ) indicated a significant positive attitude towards IPPs despite an absence of a specialized training (84%) or any personal experience, officers felt confident to deal with IPPs. Multiple regression analysis identified gender of the officers to be the only predictor for attitude towards community responsibility towards IPPs ( $p=0.047$ ). Despite the positive attitude and

\* Leila, alkasasleila@gmail.com

perceived adequate preparedness reported in the current study, considering the lack of experience stated by the officers and the analysis of individual items of the survey, several stigmatizing beliefs held by officers were identified. The findings can be used to enhance the current practices and specialized training to the police officers who deal with IPPs in Sri Lanka.

## INTRODUCTION

“Emotionally Disturbed Persons” (EDP), a term used by the New York City Police Department (2019) is defined as “a person who appears to be mentally ill or temporally deranged and is conducting himself in a manner which a police officer reasonably believes is likely to result in serious injury to himself or others”. However, in the translation of the term EDP to the language the study is conducted in (Sinhala) fails to maintain the meaning as presented in the definition thus, authors have used the term “Individuals with Psychological Problems” (IPPs) for the purpose.

As community gatekeepers, police officers are often the first respondents approached by the public seeking assistance in situations involving IPPs (Menzies, 1987). It has been identified that police officers deal with IPP related situations that amount up to 20% of all contacts, however, many argue that the actual number could be higher as most encounters are resolved informally (Cotton & Coleman, 2008; Teplin & Pruett, 1992). While Sri Lanka’s Mental Diseases Ordinance (1873) legitimizes police power to intervene in situations involving IPPs, it fails to dictate a standard protocol in officer decision-making. The legislature only requires officers to make the judgment based on whether they “believe” a person to be of “unsound mind”.

Police officers’ attitudes influence their responses and decisions made in situations involving IPPs (Green, 1995). Research shows IPPs are more likely to experience negative encounters with the police compared to the general public such as an increased likelihood of IPPs being arrested (Funn, 2017; Teplin, 1985). While the legislation grants the police discretion on decisions made in relation to IPPs, police have often failed to identify minor forms of mental illnesses and would contribute IPPs’ behaviours to situational factors such as alcoholism (Funn, 2017; Trovato, 2000)

In their studies, Lester & Picket (1978), Trovato (2000) and Cotton (2004), have identified that police officers score high on attitude benevolence; caring and accepting views towards IPPs. However, compared to paraprofessionals and the public, officers’ scores are higher on attitudes on intolerance; viewing IPPs as an inferior group needing control through coercion. Results on attitudes toward integrating IPPs into the community varied as research showed both accepting and intolerant attitudes (Bell & Palmer, 2018; Cotton 2004; Litzcke, 2006). However, the dominant attitude toward IPPs seems to be that they are dangerous and unpredictable (Litzcke, 2006).

Research on factors that predicted officers’ positive attitudes were identified as gender (i.e., being a female officer), higher level of education, age (being older), higher rank in position and years of experience. These factors lowered their decision to make arrests. Officers’ personal experience of having contact with an IPP outside work, related past training and their years of experience increased the officers’ confidence on adequate preparedness to deal with IPPs (Cotton 2004; Green, 1995; Lester & Picket 1978; Trovato, 2000).

No observations were made on a similar study conducted in South Asia including Sri Lanka aiming to investigate police attitude towards IPPs. The current study intended to investigate a sample of Police officers from Colombo district on their attitude and perceived level of adequate preparedness to deal with IPPs. Based on existing literature, authors hypothesized,

H1 -Police officers in Colombo District have a positive attitude towards IPPs

H2 - Police officers in Colombo District have a low perceived level of adequate preparedness to deal with situations involving IPPs

General objective of the study was to evaluate the attitude of police officers towards IPPs in Colombo District. The specific objectives were: -

1. To identify the extent of police officers’ attitude towards IPPs
2. To assess the police officers’ attitude on community responsibility for IPPs
3. To assess the police officers’ perceived level of adequate preparedness in dealing with situations involving IPPs

4. To identify the extent of police officers' positive attitude toward IPPs living in the community

5. To identify what factors; age, gender, level of education, years of experience, personal experience with an IPP outside of work and past training on dealing with IPPs, predicted officers' attitude from specific objective one to four

## METHODOLOGY

### Design & Materials

A cross-sectional descriptive study was conducted using the 33-item Mental Health Attitude Survey for Police (MHASP; Clayfield, 2011). In the survey, officers were asked to rate on a Likert scale of 1 to 6 on how strongly they agree or disagree with series of statements presented related to IPPs. Higher scores associated with disagreement with the given statement.

The items of the survey were distributed across four factors that were assessed. Each factor acting as own separate subscales within the survey. Factor I on "Positive Attitude toward IPPs" included items such as "one of the main causes of mental illness is a lack of self-discipline and will power". Factor II on "Negative Attitude toward Community Responsibility for IPPs" (for e.g. "increased spending on mental health services is a waste of tax"). Factor IV on "Positive Attitude toward IPPs Living in the Community" (for e.g. "residents have nothing to fear from people coming into their neighborhood to obtain mental health services"). Score of these three Factors made of 30 items provides the MHASP Total score. After reverse coding relevant items, the higher the score the more positive the attitude of the officers were.

Three items of the survey, calculated separately gave the score on Factor III "Inadequately Prepared to Deal with IPPs" which included items such as "I feel confident in my ability to handle situations involving IPPs". The adjusted Cronbach's Alphas for the four factors of the MHASP ranged from 0.753 to 0.89.

### TRANSLATION OF THE SURVEY

The survey was translated to Sinhala, the most commonly used language in Sri Lanka. The selected modifications were made to

accommodate the culture-specific differences such as, officers' highest level of education to meet the local education structure. The item race/ethnicity was removed, as the original survey included choices such as, Caucasian, Hispanic, African American and these did not represent the context of Sri Lanka.

The original definition of EDP remained; however, the term replaced to IPP and was translated to Sinhala as "මානසික අක්රමිකතා ඇති පුද්ගලයන්".

### Pilot Study

Ethical clearance was granted by the Ethics Committee of Kaatsu International University. The survey was distributed amongst five (05) government officials to assess face validity and suggested changes were incorporated.

### DATA COLLECTION

Data was collected in the month of November 2020 within the Colombo District. Seventeen police stations agreed to participate after the approval of supervising officers.

### Sample

The survey was distributed amongst 77 officers who volunteered on site. The sample consisted predominantly of male participants (77.3%) with a majority in their middle age ( $M=39.2$ ,  $SD=11.55$ ).

### DATA ANALYSIS

Descriptive and inferential statistics were conducted using the SPSS version at 0.05 alpha level. As per the guidelines, identified MHASP items were reverse coded. Each four Factors were analyzed by calculating the sum of values selected by the officers on the Likert Scale.

To identify which factors were most likely to predict the results of the MHASP, multiple regression analysis was conducted. In the assumption testing carried out for multiple regression analysis the assumption of normality was not met due to the smaller sample size. Additionally, assumption of multicollinearity was found to be higher between the variables of age and years of experience thus, variable age was removed.

Cotton (2004) highlighted the importance of analyzing responses received for individual



statements as it had a more direct influence on the actions of the police when interacting with an IPP. Thus, percentages on scores for each item were calculated. Those who selected 1 to 3 in the Likert scale were considered in agreement with the statement while 4 to 6 were considered to be disagreement.

## RESULTS

The data were analyzed of only 75 officers as two were removed due to partially completed surveys.

In the distribution of the highest level of education, majority had completed their GCE Advanced Level examination (56%) followed by GCE Ordinary Level (29.3%). The years of experience varied from one to forty years in the field ( $M = 17.52$ ,  $SD = 11.34$ ).

The majority of the officers (84%) reported of not having received any past training related to IPPs and 58.7% were informed of having no personal experience with an IPP outside their work. Scores for MHASP Total and four Factors are indicated in table 1.

Multiple regression analysis showed no variables which significantly predicted officers' attitude at an alpha level of 0.05 except for the gender of the officers on their "attitude towards community responsibility" ( $p = 0.047$ ). Percentages of those who agreed and disagreed with the given statements are shown in table 2.

## DISCUSSION

It was hypothesized that officers would indicate a significant positive attitude. The attained high MHASP Total score rejects the null hypothesis and has indicated that officers have a positive attitude towards IPPs, on the community responsibility towards IPP and considerable acceptance of IPPs living in the community.

Results of the study failed to reject the null hypothesis on police officers' perceived level of adequate preparedness in dealing with situations involving IPPs indicating that police officers perceive to have a high adequacy to face encounters with IPPs. However, it must be noted that a significant number of participants reported of not receiving any past training nor having any personal experience with an IPP. It is uncertain to which extent the officers' true adequacy was accurately represented in their self-evaluation. Only gender on community

responsibility was identified to be significant, demonstrating that there is a significant difference between two genders of the officers on caring and accepting views towards IPPs. In assessing the level of education, majority of the officers in the study had completed only school level education. Although not statistically significant, it was interesting to note that three out of the four officers who were postgraduates were from programs on psychology and counseling.

Although a majority agreed on perceiving IPPs to be disadvantaged group needing special consideration from the police and it being an integral part of community policing, 92% had agreed on the statement that IPPs take up more than their fair share of police time and should mental health services be adequate, the police would not have to deal with IPPs. The need for the government to allocate more expenditure towards enhancing facilities and services towards IPPs was highlighted. The majority disagreed with statements that indicated it was foolish to marry someone with a mental illness although they are fully recovered and that IPPs need to be isolated and avoided. Many agreed on the statement that a tolerant attitude should be maintained towards IPPs.

In a community level, officers showed more acceptance towards having mental health facilities located in the neighbourhood and did not identify IPPs living in the community to be threatening and would encourage community members to feel the same. However, it was also believed that having IPPs living within residential neighborhoods might be good therapy but the risks to residents are considerably higher. This belief was also supported by literature that the most common beliefs held on IPPs being dangerous (Litzcke, 2006). Other stigmatizing attitudes were observed with statements that IPPs should not be trusted with any responsibility. The majority of the officers accepted the statement that the main causes of mental illness being lack of self-discipline and will power, and that IPPs needed the same kind of control and discipline as a young child.

Recorded negative attitude expressed associated with stigma on IPPs are likely to be a result of insufficient knowledge on mental health conditions. Thus, with training and educational programs it is possible to change these stigmatizing beliefs. It is suggested for future studies to examine the current

curriculum of the police academy on mental health and existing training. Furthermore, for policy makers to draw clear guidelines on how police should deal with situations involving IPPs followed by comprehensive trainings.

Almost all officers agreed to IPPs taking a considerable amount of police time. It is suggested for policy makers to explore new means to resolve the issue such as introducing trained mental health professionals to work in affiliation with each police station.

More research on police encounters with IPPs need to be conducted to identify common forms of encounters and associated problems, decisions made in such encounters; formal or informal which will allow us to improve our understanding on current practices and training requirements.

## **LIMITATIONS**

Originally intended, calculated sample size was not achieved due to the COVID -19 Pandemic. Incorporation of multiple sources and analysis of information are required due to limitations imposed by surveys. Certain items of the current survey were not identified by the Sri Lankan police officers as part of their role. An example is the item on emergency commitment of an IPP.

## **CONCLUSION**

The current study based on a survey was able to identify that the police officers of the Colombo district largely hold a positive attitude towards IPPs and a perceived level of adequate preparedness to deal with IPPs based on the MHASP scores. However, analysis of individual items of the survey indicates stigmatizing attitudes held by the police officers. If these are not challenged, the negative attitudes will continue to sustain a system of insufficient training programs related to mental health awareness while the subsequent decisions derived from poor knowledge on the topic, as evidence indicates, leads to the poor protection of IPPs and as an already vulnerable group will be left further defenseless. Furthermore, the perceived level of adequate preparedness amongst officers to deal with IPPs despite their lack of personal experience and training brings forth more questions on the existing practices.

While lack of training in mental health has maintained stigmatizing beliefs about IPPs, the

author remains optimistic that with adequate training programs, negative attitudes and beliefs shared amongst officers can be improved. Especially considering the interest shown in officers to pursue higher studies in counseling and psychology. Despite identified limitations, the author believes that the results of the study have given greater insight into the existing attitudes of police officers in Sri Lanka.

## **ACKNOWLEDGMENT**

I would like to thank all those who supported me to make this research a success. A special thanks to co-author Mr. Ponnampereuma for your unwavering support throughout the research.

## **REFERENCES**

- Bell, S., & Palmer-Conn, S. (2018). Suspicious Minds: Police Attitudes to Mental Ill Health. *International Journal of Law and Public Administration*, 1(2), 25 - 40.
- Clayfield, J., Fletcher, K., & Grudzinskas Jr., A. (2011). Development and Validation of the Mental Health Attitude Survey for Police. *Community Mental Health Journal*, 47(6), 742–751.
- Cotton, D. (2004). The Attitudes of Canadian Police Officers Toward the Mentally Ill. *International Journal of Law and Psychiatry*, 27(2), 135-146.
- Cotton, D., & Coleman, T. (2008). A Study of Police Academy Training and Education for New Police Officers Related to Working with People with Mental Illness. Ottawa: Mental Health Commission of Canada.
- Funn, N. (2017). Law Enforcement Officer Knowledge of Mental Illness (Ph.D). Walden Dissertations and Doctoral Studies. 4057.<https://scholarworks.waldenu.edu/dissertations/4057>
- Green, T. (1995). Police as Frontline Mental Health Workers: The Decision to Arrest or Refer to Mental Health Agencies (Doctoral dissertation).

- Lester, D., & Pickett, C. (1978). Attitudes Toward Mental Illness in Police Officers. Psychological reports.
- Litzcke, S. (2006). Attitudes and Emotions of German Police Officers towards the Mentally Ill. *International Journal of Police Science & Management*, 8(2), 119-132.
- Menzies R. Psychiatrists in blue: Police apprehension of mental disorder and dangerousness. *Criminology*. 1987; 25(3):429–453.
- Metal Diseases Ordinance (1873), Sri Lanka.
- New York City Police Department. (2019). Patrol Guide - Mentally Ill or Emotionally Disturbed Persons (p.1). New York.
- Teplin, L. (1985). The Criminality of the Mentally Ill: A Dangerous Misconception. *American Journal of Psychiatry*, 142(5), 593-599.
- Teplin, L. A., & Pruett, N. S. (1992). Police as Streetcorner Psychiatrist: Managing the Mentally Ill. *International Journal of Law and Psychiatry*, 15(2), 139-156.
- Trovato, F. 2000. Community Policing and the Emotionally Disturbed Persons: Are we Meeting Their Needs? Unpublished Master's Thesis, Niagara University. Niagara Falls, New York

## ANNEXURE

**Table 1**

### *Scores for MHASP*

Measurement	n	Scored out of	M	SD
Factor I	64	84	53.69	11.52
Factor II	73	42	36.95	4.34
Factor III	73	18	7.55	2.91
Factor IV	72	60	46.03	7.43
MHASP Total	61	180	132.67	17.55

**Table 2**

### *Individual items analysis*

<b>Positive attitude towards IPPs</b>	Agree	Disagree
1. IPPs take up more than their fair share of police time.	92	8
3. IPPs need the same kind of control and discipline as a young child.	76	22.7
10. One of the main causes of mental illness is a lack of self-discipline and will power.	65.4	34.7
19. IPPs should not be given any responsibility.	57.4	38.6
32. If mental health services were adequate, the police would not have to deal with IPPs	65.3	34.6
<b>Feeling of inadequately prepared to deal with IPPs</b>	Agree	Disagree
18. I feel that I am adequately trained to handle situations/calls involving IPPs	74.7	25.3
31. I feel confident in my ability to handle situations involving IPPs	90.6	9.3
<b>Positive attitude towards IPPs living in the community</b>	Agreed	Disagree

29. Having IPPs living within residential neighborhoods might be good therapy but the risks to residents are too great.	57.3	42.6
--	------	------



## Perceived Stress Level and Associated Factors among Allied Health Science Undergraduates in University of Sri Jayewardenepura

\*<sup>1</sup>Hiranga Wijedasa

<sup>1</sup>\* Sri Lanka Institute of Information Technology, Sri Lanka

### ARTICLE INFO

#### Article History:

Received Date: 01 July 2022

Accepted Date: 15 September 2022

#### Keywords:

Perceived Stress; Allied health Undergraduates; Associated factors

#### Citation:

Hiranga Wijedasa. (2022). *Perceived Stress Level and Associated Factors among Allied Health Science Undergraduates in University of Sri Jayewardenepura*. Proceedings of SLIIT International Conference on Advancements in Sciences and Humanities, (11) October, Colombo, 354 - 361.

### ABSTRACT

A cross sectional descriptive study was carried out to determine the level of stress and its associated factors among Allied Health Science undergraduates in University of Sri Jayewardenepura. A convenient sample of 150 Allied Health Science undergraduates who follow Bachelor of Science in Nursing (B.Sc.N), Bachelor of Pharmacy (B. Pharm) and Bachelor of Science in Medical Laboratory Science (B.Sc. MLS) degree programmes were selected as the study sample. A self-administered questionnaire with both open ended and close-ended questions was used as the research tool. The Perceived Stress Scale (PSS) developed by Cohen et al. (1994) was used to evaluate students' perceived level of stress (PLS) during the last month. Irrespective of the year of study, B.Sc. Nursing undergraduates have scored higher level of perceived level of stress which is statistically significant in a chi-square test when comparing with B. Pharm and B.Sc. MLS undergraduates. Perceived level of stress had no significant association with socio-demographic factors including sex. Increased academic work load and financial difficulties were the prioritized factors associated with stress. The lack of personal freedom, conflicts with colleagues, unsupportive staff at the clinical placement and lack of support services were also reported as the other factors associated with the level of perceived stress among undergraduates.

\* Hiranga, hiranga.w@slit.lk

## INTRODUCTION

The term "stress" was coined by Hans Selye in 1936, who defined it as "the non-specific response of the body to any demand for change" (American Institute of Stress, 2007). As stated by Randy and David (2008), constant stress brings about changes in the balance of hormones in the body which may lead to feeling frustrated, angry, nervous, or anxious. Stress is situational and it may affect individuals in any age, no matter what their educational background or role is. Stress can be healthy as it provides positive motivation, but it can be very damaging for students' health and work performance when it is experienced over an extended period of time (American Psychological Association, 2013). Chronic stress can lead to physical problems including cardiovascular diseases, muscle pain, stomach and intestinal problems (Seymour & Black, 2002). Moreover, high occurrence of psychological distress is common among students of health care profession (Aktekin et al. 2001). One of the studies conducted at University of Sri Jayewardenepura reported psychological distress among more than a half (59.6%) of the study population (Liyanage,

2017). A considerable prevalence in different levels of depressive symptoms is also seen among undergraduates enrolled in medical and allied health science programmes in Sri Lanka (Kodagoda & Meegoda, 2020).

Allied Health Science (AHS) undergraduates of the University of Sri Jayewardenepura (USJP) are those who follow Bachelor of Science in Nursing (B.Sc.N), Bachelor of Pharmacy (B.Pharm), and Bachelor of Science in Medical Laboratory Science (B.Sc.MLS) degree programmes. AHS students undergo both academic and clinical-based learning. B.Sc.N students spend more time in hospitals for their clinical training while they have practical sessions at the skills lab in the University. B. Pharm. and B.Sc.MLS students also undergo hospital based learning, and they spend more time in practical sessions in laboratories. All students have to face both written and practical examinations including Objective Structured Practical Examinations, Objective Structured Clinical Examinations and Viva Vorce Examinations. Many studies indicated Academic work load and examinations cause higher level of stress as mentioned in the below table (01).

Table 01: Factors associated with stress

Factor	Literature
Higher academic work load or requirements / Long study hours/ excessive homework	Kashif & Khan (2020); Azim & Baig, (2019); Alsaqri (2017); Liyanage (2017); Agolla & Ongori (2009); Misra & Mckean (2000)
Frequent examinations	Kashif & Khan (2020)
Economical issues/constrains	Azim & Baig, (2019)
Parental Pressure due to higher expectations or Conflicts/ quarrels with them	Kashif & Khan (2020); Graf et al., (2010)
Time pressure	Misra & Mckean, (2000); Saeed et al., (2016)
Accommodation away from home/ family	Kashif & Khan (2020)
Uncomfortable classrooms and Unavailability of internet access	Jiang et al. (2022); Misra & Mckean (2000)
Conflicts with faculty members	Misra & Mckean (2000); Topper, (2007)
Anticipated fear/anxiety about future career	Kashif & Khan (2020); Agolla & Ongory (2009); Polychronopoulou (2005)

Other than these, many environmental factors including the regional internet access, size of the city and type of the university also contribute to students' psychological stress (Jiang et al., 2022).

Therefore, this study is conducted to determine the perceived level of stress and its associated factors among the AHS undergraduates in USJP. The findings of this study will be useful for the students to understand their levels of perceived stress and for the teachers to identify the strategies to reduce the level of stress among AHS undergraduates. It will also be useful for the university to increase facilities / welfare services and ultimately to the country to improve the quality of AHS graduates.

## METHODOLOGY

**Study design:** Cross sectional descriptive design is adopted to identify the PLS and its associated factors among AHS undergraduates.

**Study Population:** The study population consisted of 275 Allied Health Science undergraduates (who are following B.Sc. Nursing (95), B. Pharm (85) and B.Sc. Medical Laboratory Science (95) courses in the University of Sri Jayewardenepura.

### Sample and Sampling method:

The sample size was decided at the 5% margin of error with 95% confidence. According to Abramson (1991), when the population size is known (N) the sample size (n), at the margin of error of 5% with 95% confidence interval is given by the following equation.

$$= (N \times X) / ((X + N - 1)), \text{ where } X = (([1.96]^2) * ([0.5]^2)) / ([.05]^2) = 384$$

Non-probability sample was drawn from Allied Health Science undergraduates from each degree programme studying in 1st year to 4th year. Simple stratified sample of 150 AHS undergraduates responded to an anonymous, self-administered questionnaire. The sample consisted of 45 students from each studying year. According to the equation, the sample size was found as n= 160. However, a convenient sample of 150 was selected due to various constraints such as time and other resources. At the time of data collection both final year students have completed their final examinations. Therefore they were excluded according to the exclusion criteria.

**Inclusion criteria:** AHS undergraduates from each degree programme in USJP.

**Exclusion criteria:** Students who have completed final examination at the time of data collection and the students who cannot understand Sinhala and English medium.

### Study instruments

The Perceived Stress Scale (PSS), developed by Cohen et al. in 1994 was adapted (with Sinhala translation) to evaluate the students' LPS during the last month. Many studies have used different instruments to measure stress level. Among these PSS was chosen since this instrument has been documented for its reliability and validity. Along with the PSS, a self-administered questionnaire was used to collect data regarding the demographic factors (Section1) and to determine the factors associated with stress. In the section 2 of the questionnaire, participants were asked to organize some factors associated with stress which are drawn from the recent literature in descending order by giving numbers 1-10 in front of each factor mentioned in the chart. Further students were asked to state their own factors associated with PLS for the open ended question provided at the end of section 2.

## DATA COLLECTION

Data collection was performed after receiving the ethical approval from the ethical review board of the faculty of Medical Sciences, USJP. A pilot study was also conducted to determine the level of understanding and the time taken to complete the self-administered questionnaire. Data collection was performed at a convenient time for the students. Privacy and confidentiality of provided information/data was ensured.

## DATA ANALYSIS

After collecting all completely filled questionnaires, data were entered to the Statistical Package for the Social Science (SPSS) version 20.0. Basic exploratory analysis and chi-square analysis for 2-way frequency tables were carried out using SPSS. As recommended by Cohen et al. (1994) PSS scores are obtained by reversing responses (e.g., 0 = 4, 1 = 3, 2 = 2, 3 = 1 & 4 = 0) to the four positively stated items (items 4, 5, 7, & 8) and then summing across all

scale items. According to the PSS, score for the level of stress was labelled as:

0- 10 : No Stress

11- 20 : Mild Stress

21- 30 : Moderate stress

31- 40 : Severe Stress

As none of the students were in the No stress category and the Severe stress category, the stress level was then renamed as Mild Stress =

## Ethical Considerations

Ethical approval was obtained from the Ethical Review Committee of Faculty of Medical Sciences, University of Sri Jayewardenepura. The verbal consent was obtained from each participant prior to data collection after explaining the purpose of the study. Privacy and confidentiality of provided information/data was

Characteristics	Category	Number (N=150)	Percentage (%)
Course	B. Sc Nursing	60	40.0
	B. Pham	45	30.0
Year	1st Year	45	30.0
	2nd Year	45	30.0
	3rd Year	45	30.0
	4th Year	15	10.0
Gender	Male	52	34.7
	Female	98	65.3
Marital Status	Married	3	2.0
	Unmarried	147	98.0
Monthly Income	Parents	84	56.0
	Mahapola	8	5.3
	Bursary	5	3.3
	Other Source	8	5.3
	Parents+ Mahapola	42	28.0
	Parents+Bursary	3	2.0

Low level of stress and Moderate Stress = High level of stress for this study. ensured.

## RESULTS

Table 02: Distribution of Demographic data

Data reveals that 40% participants of the sample, are from B.Sc. Nursing programme and rest of the participants represent B. Pham and B. Sc. MLS in similar proportions (30%). The majority of students were females (65%). Further, majority of participants were unmarried (98%) in the sample. Majority of students receive their income from parents only (56%), while 28% receive their income from both parents and Mahapola scholarship.

Table 03:

Level of Stress	Number(N)	Percentage (%)
Low level of Stress	84	56.0
High level of Stress	66	44.0
Total	150	100.0

Distribution of perceived stress level among Allied Health Science undergraduates



Characteristics	Category	Number (N=150)	Percentage (%)
Course	B. Sc Nursing	60	40.0
	B. Pham	45	30.0
Year	1st Year	45	30.0
	2nd Year	45	30.0
	3rd Year	45	30.0
	4th Year	15	10.0
Gender	Male	52	34.7
	Female	98	65.3
Marital Status	Married	3	2.0
	Unmarried	147	98.0
Monthly Income	Parents	84	56.0
	Mahapola	8	5.3
	Bursary	5	3.3
	Other Source	8	5.3
	Parents+ Mahapola	42	28.0
	Parents+Bursary	3	2.0

Table 03 reveals that

majority of (56%) students have mild stress while 44% are having moderate level of stress.

Table 04: Distribution of stress level by the course followed.

	B.Sc Nursing N (%)	B. Pham N (%)	B.Sc. MLS N (%)	Total N (%)
Low level of Stress	24 (28.6)	31 (39.9)	29 (34.5)	84 (100)
High level of Stress	36 (54.5)	14 (21.3)	16 (24.2)	66 (100)
Total Number (%)	60 (40)	45 (30)	45 (30)	150 (100)

As the chi-square test is significant at 5% level, it can be concluded that there is a significant association between the two levels of stress and the three types of course followed. Among the high stress level students, the percentage of B. Sc. Nursing (54.5%) is much higher than that of B. Pharm students (21%) and of B. Sc. MLS students 24% who are having high level of Perceived Stress.

Table 05: Distribution of stress level by the year of studying

	1st Year N (%)	2nd Year N (%)	3rd Year N (%)	4 <sup>th</sup> Year N (%)	Total N (%)
Low level of Stress	29 (34.5)	22 (26.2)	23 (27.3)	10 (11.9)	84 (100)
High level of Stress	16 (24.2)	23 (34.8)	22 (33.3)	5 (7.5)	66 (100)
Total	45 (30)	45 (30)	45 (30)	15 (10)	150 (100)

Table 05 reveals that 35% of 2nd year students and 33% of 3rd year students are having high level of stress while 24% of 1st year students and 8% of 4th year students are having high level of PS.

Table 06: Distribution of stress level by sex

	Male N (%)	Female N (%)	Total N (%)
Low level of Stress	26 (31)	58 (69)	84 (100)
High level of Stress	26 (39.4)	40 (60)	66 (100)
Total Number(%)	52 (34.7)	98 (65.3)	150 (100)

As per the table 06, 60% of female students have shown high level of perceived stress while 39% of male students are in the same category. Sixty nine percent of female students are having low level of stress while 31% of male students are in the same category. This association is not statistically significant at 0.05 level of confidence.

Table 07: Distribution of the Prioritized factors

Factor	Number	Percentage	Majority of students have indicated that
Higher academic work load/ Long study hours/ excessive homework	78	52%	
Economic issues/constrains	47	31%	
Time pressures	25	17%	

“Higher academic work load / Long study hours/ excessive homework” as the number one factor which makes them stress. The second most popular factor was financial burden and the Time Pressure is in the third place.

Other factors associated with the level of perceived stress

Participants have stated they are stressed due to lack of personal freedom in the university life (27%), Conflicts with colleagues (18%), Unsupportive staff at the clinical placement (12%), Lack of supportive services to cope with stress (12%), Unavailability of internet access (9%), Difficulties of transportation(8%) and Inability to participate physical lectures/ practicals (7%).

What are the factors associated with your perceived level of stress?

Expressions of the undergraduates for the above mentioned question are stated below.

One of the participants indicated that “As I live in a shared room with five others there is no personal freedom for sleeping studying or even changing clothes and that is the most recent stress causing factor for me”.

Considering stress caused by colleagues at the group activities, one participant stated; “I experienced a higher level of stress during the last month when I was working with male colleagues”. While another one stated that “ I hate group activities as my group always waits until the last minute So, I myself complete group assignments and submit on behalf of the group and it made me stress a lot during the last

month”. Another participant also mentioned the same idea: “I was stressed at a recent batch meeting as there were some miscommunications”. Many students have stated that the stress factor can be varied time to time but if they have a good support system they can manage it effectively.

## DISCUSSION AND LIMITATIONS

Findings show that the prevalence of PLS varies from mild to moderate. In the current study the findings show that the level of stress calculated from PSS scores among nursing students were significantly higher than that of other students. There were no previous studies compatible with the finding as there were no studies done to compare the PSL among AHS undergraduates in literature. According to Evans & Kelly (2004) nursing students have reported a widening gap between theory and practice as the most stressful element of clinical practice. They also stated that student nurses experience more stress as a result of relationship difficulties with clinical staff. In the current study, factors associated with the stress of AHS undergraduates are assessed but not specifically with the nursing students.

The prevalence of stress is the highest among third-year medical students (Saipanish, 2003)

contrary to the findings of this study as no significant difference in PSL is seen among the undergraduates with the year of studying. The sample proportion of female students (65%) was higher than the male proportion (35%) in the current study. Still, there is no significant association of PSL with the sex contrary to the findings of Kashif and Kha (2020); Fawzy and Hamed (2017); Wahed and Hazard (2016). Findings reflect that most of the students (36%) have prioritized "Increased academic workload" as an associate factor with perceived stress. This finding is in agreement with many studies: Tariq et al. (2020); Azim and Baig (2019); Alsaqri (2017); Liyanage (2017); Albert et al. (2010) and Misra and McKean in 2000. Unsupportive staff at the clinical placement and lack of support services were found as the factors prioritized next to the academic workload. Considerable number of students (47%) have stated that the unavailability of internet access makes them stressed. It is similar with the findings of Jiang et al. (2022) as they have found that the regional internet access was negatively associated with students' PSL.

Conflicts with faculty members is marked as the least factor which causes stress. This is inconsistent to the study by Topper in 2007 and the findings revealed that there is a positive relationship between students and the academic staff.

In order to find out the major causes of stress, the students were restricted to one open ended question which required to state their experience related to factors associated with PLS. Factors stated by the students are in line with the identified stressors in many studies done with medical undergraduates. Poor lifestyles, financial constraints, lack of support services (Azim & Baig, 2019) and conflicts with parents (Albert et al., 2010) are some of these. The cross-sectional nature of this study limits the capacity to demonstrate the PLS and its associated factors. Since the data is collected on self-administered questionnaires it is impossible to rule out information bias. Further, the results cannot be generalized to other populations as the study was conducted in a single university in Sri Lanka. Qualitative study is suggested to determine the factors associated with stress.

## CONCLUSION

All students were having mild or moderate level of stress during the recent month as per the PSS (Cohen et al., 1994). B.Sc. Nursing students have a statistically significant higher PLS compared to B. Pharm and B.Sc. MLS undergraduates. PLS had no significant association with socio-demographic factors. When considering the factors associated with PLS, higher academic work load was prioritized and various different factors were also found. It can be concluded that improvement of support services may be helpful for the undergraduates to cope with stress.

## REFERENCES

- Agolla, E.J., Ongori, H. (2009). An assessment of academic stress among undergraduate students The case of University of Botswana, viewed on 5 July 2021, retrieved from <<http://www.academicjournals.org/ERR>>.
- Aktekin, M., Karaman, T., Senol, Y. Y. & Erdem, S. (2001). Anxiety, depression and stressful life events among medical students: a prospective study in Antalya, Turkey. *Medical Education*, 35(1), 12-17.
- Alsaqri, S. H. (2017). Stressors and coping strategies of the Saudi nursing students in the clinical training: a cross-sectional study. *Educ Res Int.* 2017;2017:2017. <https://doi.org/10.1155/2017/4018470>
- American Institute of Stress, (2007). Stress, Definition of Stress, Stressor, viewed on 22 April 2021, retrieved from <[www.stress.org/topic-definition-stress.htm](http://www.stress.org/topic-definition-stress.htm)>.
- American Psychological Association, (2007). Americans under stress, Retrieved on 3rd August 2021 from <http://gad.about.com/b/2007/10/25americans>
- Azim, S. R. & Baig, M. (2019). Frequency and perceived causes of depression, anxiety and stress among medical students of a private medical institute in Karachi: a mixed

- method study. *J Pak Med Assoc.* Jun;69(6):840-845. PMID: 31189292
- Cohen, S., Kamarck, T. & Mermelstein, R. (1994). Perceived stress scale - 10-item version. *Psychology*,1–3.  
<https://doi.org/10.1037/t02889-000>
- Evans, W. & Kelly, B. (2004). Experienced stressors and coping strategies among Iranian nursing students, viewed on 24 April 2021
- Fawzy, M. & Hamed, S. A. (2017). Prevalence of psychological stress, depression and anxiety among medical students in Egypt. doi: 10.1016/j.psychres.2017.05.027.
- Graf, H., Melton, B. & Gonzalez, S. A. (2019). Qualitative study of stressors, stress symptoms, and coping mechanisms among college students using nominal group process. *J Georgia Public Health Assoc.* 2010;5:24–37.
- Jiang, S., Zhang, W., Yang, T., Wu, D., Yu, L. & Cottrell, R. R. (2022). Regional Internet Access and Mental Stress Among University Students: A Representative Nationwide Study of China. DOI: 10.3389/fpubh.2022.845978
- Kashif, M, & Khan, T. (2020). Level of Stress and its Association with Socio-Demographic Factors Among Students of Allied Health Sciences. *Journal of Rawalpindi Medical College Students Supplement*;2016:20(S-1):27-30
- Kodagoda, A. S. K. & Meegoda, M. K. D. L. (2017). The Prevalence of Depression among Undergraduates of a Selected Medical Faculty in Sri Lanka. *Journal of Health Sciences and Innovative Research* 1 (01), 31-3
- Labib, N. A., Barakat, A.A., El Sherbiny, N. & Ebrahim, E. (2010). Stress Profile among Fayoum University Students. *Egypt Journal Community Medicine*;28:59–71.
- Liyanage, G. Psychological distress among final year medical undergraduates in a Sri Lankan university.;4(11):1–4.
- Misra, R. & Mckean, M. (2000). College students' academic stress and its relation to their anxiety, time management and leisure satisfaction, *American Journal of Health Studies*, vol.16, no.1, pp41-51
- Polychronopoulou, A., & Divaris, K. (2005). Perceived Sources of Stress among Greek Dental Students. *Journal of Dental Education*, 69, 687-692
- Randy, J. L. & David, M. B. (2008). Stress among the nursing students, Students' Publications, viewed on 05 May 2021, <[www.ifeet.org/stress among the nursing students.html](http://www.ifeet.org/stress%20among%20the%20nursing%20students.html)>.
- Sabih, F., Siddiqui, F. R. & Baber, M. N. (2013). Assessment of stress among physiotherapy students at Riphah Centre of Rehabilitation Sciences, *Journal of Pakistan Medicine* 63(3)
- Saeed, A. A., Bahnassy, A. A., Al-Hamdan, N. A., Almudhaibery, F. S. & Alyahya, A. Z. (2016). Perceived stress and associated factors among medical students. *Journal of Family Community Medicine*. doi: 10.4103/2230-8229.189132
- Saipanish, R. (2003). Stress among medical students in a Thai medical school, *Med Teach*  
DOI: 10.1080/0142159031000136716
- Shah, M., Hasan, S., Malik, S. & Sreeramareddy, C. T. (2010). Perceived Stress, Sources and Severity of Stress among medical undergraduates in a Pakistani Medical School. *J Pak Med Assoc.* 31954045 DOI: 10.5455/JPMA.2153
- Tariq, S., Tariq, S., Tariq, S., Jawed, S. (2020). Perceived stress, severity and sources of stress among female medical students in a private medical college in Pakistan. *J Pak Med Assoc.* Jan;70(1):162-167. doi: 10.5455/JPMA.2153. PMID: 31954045.
- Topper, E. F. (2007). Stress in the library workplace. *New Library World*, (11/12), 561-564. University of Melbourne.



## Perceptions of People with Mental Disorders about Their Mental Health Condition; An Exploratory Study

\*<sup>1</sup>Ven. Koonkandawala Wimaladhamma

<sup>1</sup>Buddhist and Pali University of Sri Lanka

### ARTICLE INFO

#### Article History:

Received Date: 01 July 2022

Accepted Date: 15 September 2022

#### Keywords:

Self-Perception; Self-Identity; Self-esteem; Mental Health; Mental Illness

#### Citation:

1Ven. Koonkandawala Wimaladhamma. (2022). *Perceptions of People with Mental Disorders about Their Mental Health Condition; An Exploratory Study*. Proceedings of SLIIT International Conference on Advancements in Sciences and Humanities, (11) October, Colombo, 362 - 367.

### ABSTRACT

This exploratory study was conducted to explore how people who have been diagnosed with mental disorders perceive their mental health condition, and their descriptions of lived experience of it. It also explored how their mental health condition might influence how they perceive themselves, their relationships, and how they engage the world around them through their activities. Sixteen participants (16) with a diagnosis of a mental disorder were the sample. The participants of the study were taking medication for the diagnosed mental disorder from a period of a minimum of six (06) months up to forty-seven (47) years. The data were collected at the Psychiatric Clinic, the General Hospital (Teaching), Kandy. The data were interpreted using Interpretative Phenomenological Analysis (IPA). It was identified that all the participants defined and understood mental health and mental illness through their lived experiences of mental illness. It was also identified that most of the participants experience some element of unhappiness or dissatisfaction because of their mental illness. However, the participants' positive self-esteem has played an important role in adjusting to the identity with the mental illness. The participants also valued the physical and psychological support they receive from their family members and others when they deal with their mental illness. Emotional support was highly valued by almost all the

\* Wimaladhamma, wimaladhamma@bpu.ac.lk

participants. It is expected that the generated knowledge of this research would help mental health professionals to work with families to construct an enabling view of the person with the illness and move away from treating them as helpless and irresponsible.

## INTRODUCTION

A mental illness significantly disturbs an individual's cognition, emotion regulation and behaviour (American Psychiatric Association [APA], 2013). A large number of Sri Lankan people suffer from various mental health problems. However, services for mental illnesses are not considered to be a priority in Sri Lanka compared to other kinds of health services (Samarasekare et al., 2012). Even in the health sector, "mental health" is treated differently, and priority is given to physical illnesses (Samarasekare et al., 2012). In the Sri Lankan context, it can be identified that the general population, family members of the people with mental illness, and sometimes even mental health professionals hold some perceptions about people with mental illness (specially people with psychosis and other severe mental illnesses); such as, they are unable to take decisions about their life, they should be constantly looked after by someone else, they are unable to engage in an employment, etc.

People who have been diagnosed with various mental illnesses may experience, understand, and perceive their mental illness differently. Furthermore, the severity of a

mental illness also impacts expectations in the fulfilment of role function and disability status too (Zimmerman et al., 2018). So, the personal experience of a mental illness may differ from person to person. Further, depending on subjective factors of an individual, and sociocultural and interpersonal factors too, the experience of a mental illness and the meaning an individual gives to his or her mental illness may differ from person to person. Corrigan et al. (2004) and Wahl (2003) found that attitudes and beliefs about mental illnesses are shaped by personal knowledge about mental illnesses, knowing and interacting with someone living with a mental illness, cultural stereotypes about mental illnesses, media stories, and familiarity with institutional practices and past restrictions (e.g., health insurance restrictions, employment restrictions, and adoption restrictions). Further, it has been identified that adaptation to one's mental illness can be a long-lasting and emotionally draining process (Bennett & Freeman, 1991). However, research also suggests that people with mental illness engage in their personal and professional activities very productively with the mental illness (Hilton et al., 2010; Wang et al., 2008).

This study is contextualized and supported by two main theoretical frameworks: Neisser's Perceptual Cycle Model (PCM) (Neisser, 1976) and Bem's Self-Perception Theory (Bem, 1972). Further, the "Study on self-perception and impression creation" by Khan et al. (2014) was also used in this study to develop the conceptual framework of the study.

## CONCEPTUAL FRAMEWORK

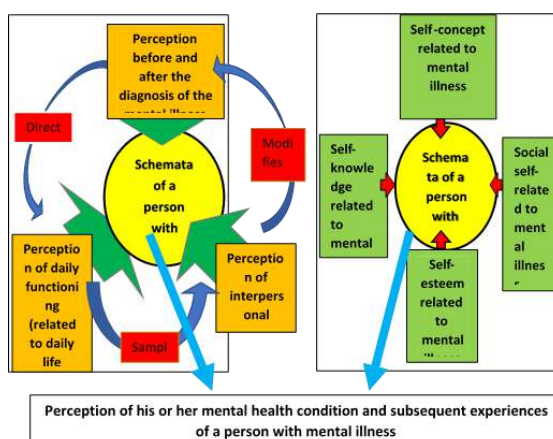


Figure 1

*Note.* This conceptual framework was developed from "Cognition and Reality: Principles and Implications of Cognitive Psychology by Neisser, 1976 (n. p.) and "Study on Self-Perception and Impression Creation" by Khan et al., 2014, *Sydenham Management Review*, 3(2), p.5.

Using the above conceptual framework, this study explored how people who have been diagnosed with different mental illnesses or mental disorders perceive and interpret their mental health condition and subsequent experiences. The study especially focused on the perceptions that people diagnosed with mental illness may have about themselves and their interpersonal relationships. Additionally, the study also explored participants' perceptions of their daily life and strategies they use to cope with the challenges of their mental illness.

### **OBJECTIVES OF THE RESEARCH**

1. To understand how people with mental illness perceive and understand their mental illness.
2. To understand how the perceptions and understanding of mental illnesses influence perceptions of self among people living with a mental illness.
3. To understand how perceptions of self among people living with mental illness influence their attitude to day-to-day activities and treatment and recovery; and towards social connection, stigma and inclusion.

### **METHODOLOGY**

Sixteen participants (16) (7 males and 9 females) with a diagnosis of a mental disorder such as; Major Depressive Disorder, Major Depressive Disorder and Obsessions, Recurrent Episodes of Major Depressive Disorder, Schizophrenia, Persecutory Delusional Disorder and Bipolar Affective Disorder and Manic Episode were identified as the sample. The diagnosis of the mental disorder for each participant has been identified by the consultant psychiatrists at the Psychiatric Clinic, General Hospital (Teaching), Kandy. Purposive sampling method was used to select the sample. Age, culture, religious or spiritual beliefs of the participants, nature of the mental disorder, and socio-economic condition of participants were considered when selecting the sample. Permission from the Ethical Review Committee of the General Hospital (Teaching),

Kandy was obtained before conducting the research. The participants were informed of the nature of the research and they were informed that the participation in the research was voluntary and they were able to withdraw from the study at any point without getting affected by the treatments they receive or to any other benefit they receive. When the consent of the participants was obtained interview was conducted.

### **TECHNIQUES OF GATHERING DATA**

Semi-structured, in-depth, one-to-one interviews were used to collect data. The time duration for one interview session was normally 45 minutes to one hour. The interview questions covered the participants' whole life related to the mental illness; how the participants understand mental health and mental illness, how they perceive themselves and their interpersonal relationships, how they maintain their daily life with the mental illness, how they understand the causes of mental illnesses, how they perceive their life before and after the diagnosis of the mental illness, their leisure and pleasure activities, their future hopes, etc.

Gathered data were analyzed using IPA. The data were analyzed in several stages. First, transcripts were read and audio recordings were followed several times. Secondly, emerging themes were identified from the transcribed data. Then, themes were clustered after identifying the connections between emerging themes. Subsequently, subthemes were identified and then, the themes identified in the final table were written one by one. Each of the themes was described and exemplified with extracts from the interviews.

### **RESULTS AND DISCUSSION**

By analyzing the data, four major themes and other subthemes were identified;

Theme 01: Defining mental health through lived experiences of mental illness

1.1 Interpretations of mental health and mental illness

1.2 Participants' first experience with the mental illness

1.2.1 First experience with the mental illness: physical and somatic interpretations

1.2.2 First experience with the mental illness: interpretations of early life, childhood, and lifestyle

This theme explored how the participants define and interpret mental health and mental illness including their first experience of mental illness and its impact and influence on their life. Further, this theme explored the perceptions that the participants have towards the causes of their mental illnesses.

Theme 02: Self-Perception of people with mental illness

2.1 Participants' perception of themselves

2.2 Perception of life before and after the diagnosis of the mental illness

2.3 Perception of the meaning of life

2.4 Perception of hopes, aspirations, and future life

This theme explored how the participants perceive themselves; whether they look at them positively or negatively. Further, how they perceive their life with the mental illness and how they ascribe meaning to their life, and how they perceive the differences of their life before and after the diagnosis of the mental illness; were also explored under this theme.

Theme 03: Perception of daily life among people with mental illness

3.1 Approaches to facing a mental illness and coping strategies

3.2 Interpretations of leisure and pleasure activities

How participants perceive engaging in their daily life activities with the mental illness, how they cope with the symptoms and their interpretations of leisure and pleasure activities were explored under this theme.

Theme 04: Mental illness and interpersonal relationships

Under this theme, how the participants perceive their interpersonal relationships with family members, friends and other people was explored. Perceptions of physical and mental limitations that participants experience when they maintain interpersonal relationships were also explored under this theme.

It was identified that all the participants perceive their mental health condition and subsequent experiences differently; both positively and negatively. Further, the participants defined and understood mental health through their lived experiences of

mental illness. Additionally, for all the participants, living with a mental illness was reported to be a challenge. When they described their understanding, interpretation and perceptions about their experiences and the world, their struggle with the mental illness was always added to those perceptions. Emotions such as unhappiness, sadness, anxiety, regretting, and worrying were expressed when they interpreted their experiences with the mental illness.

The participants' perceptions of themselves or their identity with the mental illness differ from person to person. It was identified that most of the participants describe some element of unhappiness, dissatisfaction, or sadness related to their identity which was shaped by their mental illness. In the same way, when it comes to self-perceptions, some participants understood, interpreted, or referred to what they have missed or lost due to the mental illness.

The participants' perceptions of spending their day-to-day life differ from person to person. They believe that the mental illness has a considerable negative effect on their daily life. As the mental illness and the side effects of the medication they are taking have limited their physical, behavioural, mental, social, interpersonal, religious, and spiritual activities; their perceptions of day-to-day life were mixed with sadness, unhappiness, regret, stress, and despair.

When it comes to interpersonal relationships, most of the participants value the physical and psychological support they receive from their family members and others. They are positive and confident about the interpersonal relationships they are having. However, some of the participants miss the emotional support in their interpersonal relationships and they experience sadness, feeling depressed, anxiety, etc. because of that. The participants' different hopes and aspirations about their life have personal meaning.

## CONCLUSION

The research identified that all the participants perceive their mental health condition and subsequent experiences in both positive and negative ways. Further, the participants defined and understood mental health through their lived experiences of mental illness. Further, almost all the



participants seemed to accept their identity with the mental illness although it was sometimes painful and challenging. As most of the participants were having their mental illness for a long time, it was like they have "adjusted to the mental illness" or they have "accepted their identity with the mental illness".

For most of the participants, their first experience with the mental illness was entirely a new experience, although some participants have experienced some psychological pain and stress since their childhood. Related to their first experience with the mental illness, most of the participants perceived or described their mental illness based on physical phenomena they had experienced such as physical or bodily pain or inability to function. This physical or bodily symptom was more observable and prominent for them to be identified than the psychological symptoms.

It was identified that the participants experience physical, psychological, and interpersonal difficulties when they engage in their day-to-day activities. Although the participants struggle with the symptoms of the mental illness, side effects of medication, and also challenges of their physical health conditions, they try their best to engage in their daily activities smoothly.

Further, when it comes to the interpersonal relationships, the quality of the interpersonal relationships was emphasized by the participants. Although the participants believe that mental illness has a considerable negative effect on their daily life, they are happy about their present situation.

## IMPLICATIONS OF THE RESEARCH

The generated knowledge of this research would help mental health professionals to work with families to construct an enabling view of the person with the illness, and move away from treating them as helpless and irresponsible. In the same way, the knowledge would also be useful for the community to respond to people with mental illness in a supportive manner.

Similarly, this research also identified that perception of the meaning of life of the people with mental illnesses differs from young persons to adults. The longer they take medication, and the older they become, people

with mental illness adjust to living with the illness, and accept their life with the illness; and they may give up on their hopes and aspirations. They may instead adopt an identity of a sick person. Thus, negative self-perception may hinder the recovery process. However, young participants seem to have a positive attitude towards life, and they want to create an identity that is not completely defined by the mental illness. So, this knowledge would be helpful to mental health professionals in their treatment procedures.

## FUTURE RESEARCH

The research identified that the participants' perception of themselves, their identity, and meaning of life change when they live with the mental illness for a long time. So, longitudinal research is beneficial to identify how their perceptions change during key life stages, and what particular factors contribute to changing their schemata at each stage.

## REFERENCES

- American Psychiatric Association. (2013). Diagnostic and statistical manual of mental disorders. American Psychiatric Association.
- Bem, D. J. (1972). Self-perception theory. In L. Berkowitz (Ed.), *Advances in experimental social psychology*. 1972(6), (pp. 1-62). Academic Press.
- Birley, J. L. (1991). Schizophrenia: The problem of handicap. In D. Bennett & H. Freeman (Eds.). *Community psychiatry: The principles*. (pp. 215-238). Churchill Livingstone.
- Corrigan, P., Markowitz, F. & Watson, A. (2004). Structural levels of mental illness, stigma and discrimination. *Schizophrenia Bulletin*. 30(3) 481-91. <https://doi.org/10.1093/schbul/kbh033>
- Hilton, M., Scuffham, P., Vecchio, N. & Whiteford, H. (2010). Using the interaction of mental health symptoms and treatment status to estimate lost employee productivity. *The Australian and New Zealand Journal of Psychiatry*. 44(2), 151-161.

- Khan, S. D., Khan, M. A. & Shaikh, A. (2014). Study on self-perception and impression creation. *Sydenham Management Review*. 3(2),
- Neisser, U. (1976). *Cognition and reality: Principles and implications of cognitive psychology*. Freeman.
- Samarasekare, N., Davies, M. L. M. & Siribaddana, S. (2012). The stigma of mental illness in Sri Lanka: The perspectives of community mental health workers. *Stigma Research and Action*. 2 (2), 93–99.
- University of Southampton. (2013). Research project: Applications of the perceptual cycle model and schema theory to aeronautical decision making.
- Wahl, O. F. (2003). News media portrayal of mental illness: Implications for public policy. *American Behavioral Scientist*. 46(12), 1594-1600.
- Wang, P. S., Simon, G. E. & Kessler, R. C. (2008). Making the business case for enhanced depression care: The national institute of mental health-Harvard work outcomes research and cost-effectiveness study. *Journal of Occupational and Environmental Medicine*. 50(4), 468-475.
- Zimmerman, M., Morgan, T. A. & Stanton, K. (2018). The severity of psychiatric disorders. *World Psychiatry: Official journal of the World Psychiatric Association (WPA)*, 17(3), 258–275.



## Online Socializing and Offline Alcohol Usage: Influence of Daily Social Media Usage on the Level of Alcohol Usage among Students at a Non-state University in Sri Lanka

Sakuni Kanjana Galappaththi<sup>\*1</sup>, Nilanga Abeysinghe<sup>2</sup>

<sup>1,2</sup> Sri Lanka Institute of Information Technology, Sri Lanka

### ARTICLE INFO

#### Article History:

Received Date: 01 July 2022

Accepted Date: 15 September 2022

#### Keywords:

Alcohol misuse; Social media; Young adults; psycho-social factors; motivation

#### Citation:

Sakuni Kanjana Galappaththi, Nilanga Abeysinghe. (2022). *Online Socializing and Offline Alcohol Usage: Influence of Daily Social Media Usage on the Level of Alcohol Usage among Students at a Non-state University in Sri Lanka*. Proceedings of SLIIT International Conference on Advancements in Sciences and Humanities, (11) October, Colombo, 368 - 372.

### ABSTRACT

Alcohol misuse can affect both the individual and society negatively. Specifically, young adults exhibit close associations with alcohol and social media. Previous studies demonstrate that online alcohol advertising promotes young people using social media to consume alcohol. This study examines the relationship between alcohol use among young adults and their usage of social media in the Sri Lankan context and any differences between levels of alcohol consumption among males and females. 300 students from a non-state university in Sri Lanka between the ages of 18 and 25 participated in a cross-sectional study conducted via online survey. Correlation and independent-sample t-test were used for data analysis. There was no significant relationship between daily social media use and alcohol use among young adults in Sri Lanka. A significant difference was observed between the level of alcohol use among males and females. Young adults in Sri Lanka are significantly influenced by a variety of sociocultural influences in their use of social media and alcohol intake. The use of social media in Sri Lanka and various alcohol-related behaviours among young people should be the subject of exploratory research, thus according to researchers.

\* Sakuni, sakuni.g@slit.lk

## INTRODUCTION

Social media platforms and social networking sites perform multiple functions in daily life. As a result, daily social media use can enhance communication, digital and technical skills, improve knowledge in different areas, provide more information seeking and learning opportunities. In fact, Sri Lanka could be placed up in the hierarchy of digital literacy and the use of technology. Over the last decade, internet and digital usage have steadily increased. COVID 19 pandemic has forced Sri Lankan youth to have higher internet use and engage in social media frequently. According to the National Youth Survey (2009), approximately 43% of young adults were computer literate, and in 2019 it amplified to 51.5%.

Digital socialising can affect the quality of both online and offline life, especially of young adults. Previous studies have linked active social media engagement to cyberbullying, online hate, and sexual abuse (Craig et al., 2020; Velásquez et al., 2021). Young adults are prone to get exposed to damaging content, which promotes alcoholism, online gambling etc while using social media. Alcohol is responsible for 5.1% of the worldwide burden of disease and injury. Hazardous alcohol consumption results in the death of 3 million people annually, representing 5.3% of all deaths. In 19-30 years, alcohol is attributable to approximately 13.5% of total deaths (World Health Organization, 2018).

Gupta et al. (2018) claim that frequent social media usage offered alcohol companies an opportunity to reach the young audience to promote their products. Research has continuously shown a relationship between social media use and increased alcohol consumption among youth (Jernigan & Rushman, 2014). Young adults produce content related to alcohol and post-related encounters, messages, and pictures on online platforms. Evidence supports an association between frequent internet use and alcohol consumption patterns (Morioka et al., 2017). Excessive internet use has been linked with anxiety, depression, and loneliness, affecting psychological well-being, especially during the ongoing pandemic.

Despite research performed in the global north and at the regional level, Sri Lankan literature lacks studies that focuses on this association between social media use and

increased alcohol consumption among youth in the local context. This study tests associations between daily social media and alcohol usage among young adults in Sri Lanka with study participants from a non-state University in Colombo. The uniqueness of the sample is also attributable to the novel nature of the study. Moreover, the study is also interdisciplinary touching on fields such as public health, sustainable development, social psychology and marketing.

Based on previous research, the current study hypothesizes:

H1: There is a significant positive relationship between daily social media usage and alcohol usage in the target population.

H0: There is no significant positive relationship between daily social media usage and alcohol usage in the target population.

H2: There is a significant difference in alcohol use among males and females in the target population.

H0: There is no significant difference in alcohol use among males and females in the target population.

## MATERIALS AND METHODS

This study used a correlational-predictive design to test the hypothesis using a cross-sectional, online survey methodology. The independent variable was self-reported time spent daily using social media, and the primary dependent variable was the level of alcohol use assigned by the AUDIT scale (Bohn et al., 1995). Convenience sampling was used. A total of 330 participated in the study. Thirty participants got excluded due to incomplete data entries. Therefore, 300 participants were included in the analysis. All participants were undergraduates between the ages of 18-25 years. 50.3% (n=151) of the participants were male, and 49.7% (n=149) were female. Participants voluntarily participated online.

The online survey included the Alcohol Use Disorders Identification Test (AUDIT) and the self-made daily social media use questionnaire. Furthermore, the survey was mainly designed in English and later translated to Sinhala. The back-translation process confirmed the accuracy and the comprehensibility of the Sinhala translation. This research received ethical approval from the SLIIT Ethics Review Committee.

## RESULTS

Internal consistency of the AUDIT scale was estimated using Cronbach Alpha. Value for Cronbach Alpha was 0.85, indicating satisfactory reliability. According to the AUDIT screening, descriptive statistics showed that most participants were in the 'Low risk' category for alcohol misuse. Moreover, most of the females represented were categorised as 'low-risk' drinkers, most of the 'Risky' type and all 'Harmful' category drinkers were males. The majority of the 'Dependent' category were males. Overall, alcohol usage was reportedly higher among males than females and according to AUDIT screening, males dominated all other categories except for the low-risk category. H1 was tested by computing correlations coefficients among the scores of the AUDIT scale and daily hours spent on social media using Pearson's correlation, and the results were not statistically significant. Hence, the null hypothesis was accepted, rejecting H1.

An independent-samples t-test was conducted to test H2, that there is a significant difference between the level of alcohol use among males and females. The test was significant,  $t(298) = 5.808$ ,  $p = .000$ , and the results were congruent with the H2. Male young adults ( $M = 3.73$ ,  $SD = 5.137$ ), on average, showed high levels of alcohol usage than female young adults ( $M = 1.00$ ,  $SD = 2.565$ ). The 95% confidence interval for the mean difference was narrow, ranging from -3.653 to -1.804. The eta square index indicated that 67% of the variance was accounted by gender.

## DISCUSSION

The findings indicated that there is a statistically significant difference between the levels of alcohol usage among males and females, while there is no significant relationship between social media usage and alcohol use in this sample. Between the two gender groups, males show higher rates and frequencies when compared to females confirming previous research in Sri Lanka (Perera & Torabi, 2004; Somatunga et al., 2014). Somatunga and colleagues (2014) state that 39.6% of the males in Sri Lanka consume alcohol, while only 2.4% of females. The current study shows the same trend after seven years.

Personal satisfaction, societal pressure, and stress reduction have been evident among the

drinking motives (Cooper et al., 1992). These domains are linked to specific characteristics of alcohol usage. Personal enjoyment motives are linked to heavy drinking, and stress (anxiety-reduction) motives have been linked to solitary and problematic drinking. However, social reasons have been linked to moderate drinking habits and are more prominent among young alcohol users.

In the Sri Lankan context, social-cognitive factors such as influencing drinking motives and alcohol drinking patterns exhibited by different age groups, are not well studied. This gap is partially due to the scarcity of epidemiological and psycho-social information. Motives and alcohol consumption reasons are directly linked to alcohol-related behaviour and outcomes. Varied age groups may have different reasons for alcohol use and misuse, influenced by various factors such as culture, nature, and nurture (Yan, 2008). As a result, motivation is a fundamental component in behavioural and psycho-social models of alcohol consumption. According to the 'three-dimensional measure of drinking motives' (Cooper et al., 1992), diverse drinking motives are associated with different drinking behaviour. As culture plays an influential role in encouraging or discouraging people toward alcohol, a thorough understanding of the motivations that lead youngsters to drink would aid community health officials in developing effective prevention and intervention strategies.

Young adults are prone to stress for numerous reasons, such as academics, peer pressure, and social acceptance. Supporting this interpretation, Perera and Torabi (2009) state that the most common reason for drinking among young males in Sri Lanka seems to be its role in stress relief. They suggest the prevalence of a general belief among young men that alcohol helps to reduce stress. The influence of this inference needs to be further studied in future research.

Many factors have contributed to the increase in alcohol consumption among young adults in Sri Lanka over the years. Easy access to alcohol across the country could be a possible cause. Compared to the past, most alcoholic beverages are easily accessible and widely available at supermarket chains and other grocery shops. Even though the legal drinking age in Sri Lanka is 21 years, anyone can purchase alcohol-containing beverages such as beer from a supermarket. However, there has

been a ban on Sri Lankan females from purchasing alcohol since 1979 (Excise Ordinance Act No.52 of 1979). Thus, even though alcohol drinking is not banned in Sri Lanka, the franchise of purchasing alcohol is only given to males. This legal restriction could probably be a reason for the higher rates of alcohol use among males than females among Sri Lankan young adults.

The current study consisted of several limitations. First, the cross-sectional design of the survey did not permit any inference of a causal effect association. Therefore, the relationship between social media use, different motives, and levels of alcohol use could have been better verified with data that allowed a regression analysis. Moreover, inherent limitations of opportunity sampling and self-reports may have influenced the study results. As drinking is considered an "anti-social behaviour" in Sri Lanka, denying participating or underreporting alcohol consumption patterns could have possibly influenced data accuracy.

## CONCLUSIONS

Social media may perform a critical yet underrated task in spreading awareness and publicising health messages among the young population. Although there is no correlation between social media usage and alcohol usage according to the current study data, further studies would shed light to the difference between gender groups and its contributory factors. Also, it is important for future research to explore how young adults' frequent use of social media could be efficiently used for awareness raising on adversities of alcohol misuse.

## REFERENCES

Atkinson, A. M., Ross-Houle, K. M., Begley, E., & Sumnall, H. (2016). An exploration of alcohol advertising on social networking sites: an analysis of content, interactions and young people's perspectives. *Addiction Research & Theory*, 25(2), 91–102.

Bohn, M. J., Babor, T. F., & Kranzler, H. R. (1995). The Alcohol Use Disorders Identification Test (AUDIT): validation of a screening instrument for use in medical settings. *Journal of Studies on Alcohol*, 56(4), 423–432.

Cooper, M. L., Russell, M., Skinner, J. B., & Windle, M. (1992). Development and validation of a three-dimensional measure of drinking motives. *Psychological Assessment*, 4(2), 123–132.

Curtis, B. L., Lookatch, S. J., Ramo, D. E., McKay, J. R., Feinn, R. S., & Kranzler, H. R. (2018). MetaAnalysis of the Association of Alcohol-Related Social Media Use with Alcohol Consumption and Alcohol-Related Problems in Adolescents and Young Adults. *Alcoholism: Clinical and Experimental Research*, 42(6), 978–986.

Craig, W., Boniel-Nissim, M., King, N., Walsh, S. D., Boer, M., Donnelly, P. D., Harel-Fisch, Y., Malinowska-Cieřlik, M., Gaspar De Matos, M., Cosma, A., van den Eijnden, R., Vieno, A., Elgar, F. J., Molcho, M., Bjereld, Y., & Pickett, W. (2020). Social Media Use and CyberBullying: A Cross-National Analysis of Young People in 42 Countries. *Journal of Adolescent Health*, 66(6), S100–S108.

Department of Census and Statistics (2020) Census of Population and Housing 2012. Retrieved from <http://www.statistics.gov.lk>

Gupta, H., Lam, T., Pettigrew, S., & Tait, R. J. (2018). The association between exposure to social media alcohol marketing and youth alcohol use behaviors in India and Australia. *BMC Public Health*, 18(1), 3.

Jernigan, D. H., & Rushman, A. E. (2014). Measuring youth exposure to alcohol marketing on social networking sites: Challenges and prospects. *Journal of Public Health Policy*, 35(1), 91–104.

McMorris, B. J., Catalano, R. F., Kim, M. J., Toumbourou, J. W., & Hemphill, S. A. (2011). Influence of Family Factors and Supervised Alcohol Use on Adolescent Alcohol Use and Harms: Similarities Between Youth in Different Alcohol Policy Contexts\*. *Journal of Studies on Alcohol and Drugs*, 72(3), 418–428.

Morioka, H., Itani, O., Osaki, Y., Higuchi, S., Jike, M., Kaneita, Y., Kanda, H., Nakagome, S., & Ohida, T. (2017). The association between

- alcohol use and problematic internet use: A large-scale nationwide cross-sectional study of adolescents in Japan. *Journal of Epidemiology*, 27(3), 107– 111.
- National Authority on Tobacco and Alcohol (2021) - TobaccoUnmasked. National Authority on Tobacco and Alcohol
- National Institute on Alcohol Abuse and Alcoholism (NIAAA) (2017). Drinking Levels Defined.
- Perera, B., & Torabi, M. (2009). Motivations for Alcohol Use among Men Aged 16–30 Years in Sri Lanka. *International Journal of Environmental Research and Public Health*, 6(9), 2408–2416.
- Somatunga, L., Ratnayake, L., Wijesinghe, W., Yapa, Y., & Cooray, M. (2014). National alcohol use prevalence survey in Sri Lanka. *Journal of the Postgraduate Institute of Medicine*, 1(0), 9.
- Velásquez, N., Leahy, R., Restrepo, N. J., Lupu, Y., Sear, R., Gabriel, N., Jha, O. K., Goldberg, B., & Johnson, N. F. (2021). Online hate network spreads malicious COVID-19 content outside the control of individual social media platforms. *Scientific Reports*, 11(1).
- World Health Organization. (2018, November 21). Alcohol. WHO.
- Yan, F. (2008). A Structural Model of Alcohol Use Pathways Among Latino Youth. *American Journal of Health Behavior*, 32(2).



## The Effect of Text Difficulty on Types of Miscues among Proficient, Average and Below Average Readers

Vanessa Therese Van Gramberg<sup>\*1</sup>, Dilhara Vithanage<sup>2</sup>

<sup>1</sup>Thrive Institute, Sri Lanka

<sup>2</sup>Teesside University, UK

### ABSTRACT

#### ARTICLE INFO

##### Article History:

Received Date: 01 July 2022

Accepted Date: 15 September 2022

##### Keywords:

Miscue; Grapho-phonics; Semantics; Syntactic

##### Citation:

Vanessa Therese Van Gramberg<sup>\*1</sup>, Dilhara Vithanage. (2022). *The Effect of Text Difficulty on Types of Miscues among Proficient, Average and Below Average Readers*. Proceedings of SLIIT International Conference on Advancements in Sciences and Humanities, (11) October, Colombo, 373 - 378.

The aim of this study was to understand the differences in the type of miscues among proficient, average and below average readers as text difficulty increases. It was hypothesised that the percentage of semantic and syntactic cues made by proficient in comparison to average and below average readers will increase as the text difficulty increases. The lack of available literature with regard to reading errors facilitated the designing of this study which could serve as a base to design remedial instruction and intervention tools. A quasi-experimental design was used to investigate this relationship. A sample of hundred and three students (N=103) were recorded while reading four levels of passages with increasing difficulty and miscues were analysed according to the three cueing system. The first level passage was a tested grade appropriate passage which was used to determine if the reader was proficient, average or below average based on their accuracy scores. Results revealed that there was no significant difference across the three cueing system and reading ability. However, it was observed that readers rely on the grapho phonics cueing system when encountered with a difficult word. The findings of this study can be used to design reading instruction and remedial systems.

<sup>\*</sup> Vanessa, vanessa\_vangramberg@ymail.com



## INTRODUCTION

Reading is a skill which is capitalized in the education system, as it is viewed as one of the main modes of acquiring information. Since early years parents and educators strive to improve reading skills in children. Reading is a process which a child goes through passing stages ranging from decoding to reading and comprehending passages. No matter how old we are, reading errors are inevitable, however, the type of reading errors or 'miscues' as they are popularly known as, can also indicate if a reader is proficient or not (Beatty & Care 2009; Harding 1985). The purpose of this paper is to examine the relationship between the type of miscues among proficient, average and below average readers.

Miscue analysis is a popular method for analysing reading levels as an analysis of miscues can reveal the strategies (Ex.: grapho phonics cues, syntactic cues or semantic cues) readers use as well as if the reader comprehends the text while reading (Adams 1998; Goodman 1976). The technique of miscue analysis has been studied since 1969. It was popularized by Ken and Yetta Goodman who believed that reading was a psycholinguistic process and so reading involves an interaction between thought and language (Goodman & Goodman 1976). As shown by many studies (Albertiny & Meyer 2010; Beatty & Care 2009; Ritter & Chaleff 2001) it is a useful technique in assessing reading as well as it can serve as an intervention tool (Almazouri 2007).

In the Sri Lankan context limited research has been conducted pertaining to literacy. Among the studies available, many have been conducted among a population of undergraduates (Abeywickrama 2010; Dhanapala 2010; Jayasundara & Premaratna 2011). The lack of available literature with regard to reading errors facilitated the designing of this study which could serve as a base to design remedial instruction and intervention tools.

The analysis of miscues is done based on the three cueing system in reading which states that while reading the reader uses grapho-phonics, syntactic and semantic cues (Adams 1998; Goodman 1976). During the early years, readers rely more on grapho-phonics cues but as they advance in their reading readers tend to use more syntactic and semantic cues (Martyn Long et al. 2011). Beatty & Care (2009), in their

study on 'Learning from Their Miscues' revealed that below average readers relied on the visual and sound properties of the text compared to proficient readers.

However, studies conducted on miscue analysis reveals mixed results. Studies conducted by Albertiny and Meyer and Chaleff and Ritter among hearing impaired students revealed that as text comprehension increases, readers tend to rely on grapho-phonics and semantic cues (Albertiny & Meyer 2010; Ritter & Chaleff 2001). However, that study was conducted on hearing impaired students whose first language is English. On the other hand, a study conducted by Beatty and Care revealed that as text difficulty increased, skilled readers tend to rely on grapho phonics cues when encountered with an unfamiliar word (Beatty & Care 2009). However, all these studies were on participants whose first language was English therefore, it is questionable if similar results would be evident in English as a second language users.

Many studies (Almazouri 2007; Bernhardt 2011; Wurr et al. 2009) have been conducted on miscue analysis with English as a second language (ESL) readers, which revealed that proficient readers tend to rely on semantic cues of the text. While case studies reveal in depth information regarding the fact that irrespective of what the first language is, advanced readers tend to rely on semantic properties of the text, yet this could also be specific to the individual studied. Would most ESL readers depend on semantic cues when faced with challenging texts? In order to address this gap of knowledge as well as lack of research regarding reading skills among the Sri Lankan population facilitated the designing of this study.

Based on the findings of the studies mentioned above and the findings from the study by Harding 1985 which states that proficient readers seem to process larger units of information utilizing more syntactic and semantic cues in reading (Harding 1985), it was hypothesised that as text difficulty increases, proficient readers will rely more on semantic and syntactic cue compared to average or below average readers.

## MATERIALS AND METHODS

A quasi experimental design was used to investigate the effect of text difficulty on types of miscues among proficient, average and

below average readers. It is hypothesised that proficient readers would make errors which are more syntactically and semantically accepted compared to average and below average readers hence the independent variables would be the reading ability (proficient, average and below average) while the dependent variable would be the type of miscues (grapho-phonics miscues, syntactic miscues or semantic miscues). The values of the dependent variable will be calculated per hundred miscues and the independent variable, reading ability will be determined by the reading accuracy scores as explained in the procedure section.

### Participants

A sample of 103 children in 3rd, 4th and 5th grades, ages ranging from 8 – 10 years (mean age 9.07 years/ SD 0.83) were randomly selected from various schools and institutes in Colombo and Gampaha Districts. The sample comprised of 47.1% males (n = 49) and 51.9% females (n = 54). Children with neuro developmental delays were excluded from the sample.

### MATERIALS

For the purpose of this study reading passages were selected from readworks.org. All passages were non-fiction with word count ranging from 260 – 310.

### Procedure

A sample of 103 children were recorded while reading individually and miscues were analysed and reading accuracy, rates were calculated. The miscues which were considered for the purpose of this study are omissions, substitutions, additions, teacher assisted (t.a), self corrections (s.c) and reversals.

The calculations for reading accuracy, are as follows (EducationWorld 2014):

reading accuracy = (total number of words - total number of errors) / (total number of words) x 100

The study was conducted in an environment with least distraction.

The study was approved by the ethics committee of Colombo Institute of Research and Psychology. A detailed description of the study was presented to the Directors of various schools and institutes as well as to the parents

and permission was obtained to recruit participants. The relevant persons and participants were briefed on the nature of the study as well as they were informed that they had the option of opting out of the study before a period of two weeks.

Initially a pilot study was conducted to select a grade appropriate reading passage (>90% accuracy rate) as well as a series of difficult passages for each grade (< 90% accuracy rate).

Initially each child was given the grade level passage and miscues were analysed and accuracy rates were calculated. Based on the accuracy rates the children were categorized as follows:

above 95% - proficient readers, 90% - 94% - average readers, below 89% - below average readers. In addition to the grade appropriate passage, each child was given three more passages with increasing difficulty and miscues were analysed.

The miscues were coded and analysed based on the findings of Goodman (1969) 'Analysis of Oral Reading Miscues: Applied Psycholinguistics' which has been modified to aid accurate assessment of reading difficulties. Each error made is coded in reference to the three cueing systems as follows: Grapho phonics: (visual) are the miscues similar in length and shape to the original word? Grapho phonics: (auditory) does the miscue sound like the original word?; Semantics: is the miscue acceptable in terms of text meaning?; Syntactic: does the miscue work grammatically in the context of the sentence? The scoring criteria was as follows: If the miscue was acceptable, it scored 1 point; If the miscue was partially acceptable it scored 0.5; if the miscue was not acceptable it scored 0 points. The scores were then summed up and was calculated per hundred miscues.

The data was analysed using Multivariate Analysis of Variance (MANOVA) and Kruskal Wallis Test.

### RESULTS AND DISCUSSION

The results obtained upon the analysis of data are presented below.

A parametric test (MANOVA) and a non-parametric test (Kruskal Wallis) were used to analyse the data. Since some parametric assumptions were violated, a non-parametric

test Kruskal Wallis was performed to confirm the results. The Kruskal Wallis test revealed no significant difference in the utilization of the three cueing system across levels of text difficulty. The results of the Kruskal Wallis Test and MANOVA were consistent therefore, it can be assumed that violation of normality did not affect the final outcome.

## DISCUSSION

It was hypothesised that proficient readers would make more semantically and syntactically acceptable miscues in comparison to average and below average readers. The results of the study revealed no significant difference across the groups. However, in all four levels of text difficulty proficient readers maintained the highest number of grapho-phonics, semantic and syntactic miscues in comparison to average and below average readers.

Contrary to Goodman's argument (1965) as cited in (Martyn Long et al. 2011) and Clay (2001) as cited in (Donna E. Alvermann & Ruddell 2013) proficient readers depend more on context and utilizes more syntactic and semantic cues compared to below average readers. The results of this study indicated that all three groups of readers relied more on the grapho phonics cueing system compared to semantic and syntactic cueing systems and proficient readers maintained the highest mean percentage for grapho phonics in comparison to average and below average readers and is in accordance with the findings of Beatty and Care's study of text difficulty and reading ability (Beatty & Care 2009). According to a study conducted by Nicholas and Hill (1985) as cited in (Martyn Long et al. 2011) mentions that as the text difficulty increases, the contribution of the context is insufficient to predict the unknown word. They further mention that the ability to utilize context is not a distinguishing factor of a poor reader from a proficient reader, but it is the ability to decode words independently that differentiates a proficient reader from a below average reader (Martyn Long et al. 2011).

The findings of this study indicates that proficient readers utilize grapho phonic cues when encountered with unfamiliar words which is contrary to the findings of Goodman (1965) as cited in (Martyn Long et al. 2011). This difference can be attributed to the fact that

Goodman's study was conducted among a population of children whose first language was English (Bernhardt 2011), but the sample gathered for this study were children from Sinhala and Tamil speaking backgrounds. Studies done by Justice and Ezelle (2000) and Clay (2002) as cited in (Martyn Long et al. 2011) reveal that exposure to reading activities within the home environment enhances the child's understanding of print, decoding abilities and syllable detection. According to Cummins (1979 & 1991) as cited in (Koda & Zehler 2008), a strong co-relation exists in the reading abilities in two languages and the reading proficiency of the first language has an effect on the reading ability in the second language and proficient readers in the first language showed poor reading abilities in the second language (Koda & Zehler 2008).

However during the study it was also noted that proficient readers from English speaking backgrounds which accounted for 6% of the sample, may have made a miscue as an attempt to maintain meaning:

Script: 'Maybe you can't sleep because you don't like sleeping alone in your room'

Miscue: 'Maybe you can't sleep because you don't like sleeping all alone in your bed room'

This is an example of what Goodman (1967) stated as cited in (Martyn Long et al. 2011; Treiman 2001) that skilled readers has a hypothesis about the text and they gather information to check their hypothesis (Treiman 2001). Skilled readers tend to guess words based on the context as explained by the top down reading process (Treiman 2001). The passage from which the first quotation was on sleeping, and subsequently the reader inserted the word 'bed' before the word room as it is associated with sleeping.

While all groups readers relied heavily on grapho phonics cues, average and below average readers substitutes non-sense words such as 'sreeched' for 'search' when encountered with an unfamiliar word. It was also observed that words which were visually or auditorily similar were substituted by all three groups of readers.

Average and below average readers utilize grapho phonics cues while paying less attention to the meaning of the text. Research supports that unskilled readers rely less on context in comparison to skilled readers (Treiman 2001). A possible reason could also be lack of exposure to the language, as mentioned by studies done

by Justice and Ezelle (2000) and Clay (2002) as cited in (Martyn Long et al. 2011). They reveal that exposure to reading activities within the home environment enhances the child's understanding of print, decoding abilities and syllable detection, therefore lack of exposure to the language could also lead to poor decoding skills.

Contrary to the findings of Goodman (1965) as cited in (Martyn Long et al. 2011), the results of this study supports that all three groups of readers was more dependent on the grapho phonics cueing system in comparison to the syntactic and semantic cueing system in accordance with the findings of Beatty and Care on text difficulty and reading ability (Beatty & Care 2009).

### **LIMITATIONS AND IMPLICATIONS**

This study was conducted among children between the ages of 8-10 who use English as their second language. However, the extent of exposure to the language at home and school was not taken into account. As literacy in the home environment has an impact on reading (Martyn Long et al. 2011) and comprehending it may have had an impact on the results of the study, as reading accuracy scores do not measure comprehension it is only limited to accuracy therefore a proficient reader may read accurately but may not necessarily comprehend the text. This may have also been a reason why proficient readers were relying more on grapho-phonics cues when encountered with an unfamiliar word. Future research should also gather data on the child's existing background knowledge in order to assess reading errors.

It would also be useful to test this hypothesis on adolescent readers, since their reading abilities are more developed compared to children between the ages of 8-10.

In Sri Lanka, English is used as a second language and there is very little research done with regard to literacy. As mentioned before a few studies on literacy had been conducted among a population of undergraduate students (Abeywickrama 2010; Jayasundara & Premarathna 2011; Dhanapala 2010) and no studies were found conducted among school children with regard to reading errors. Also since miscue analysis can be used to analyse reading errors in second language readers it can be promoted as a useful tool in assessing reading (Bernhardt 2011). Since literature

suggests that reading is not limited to decoding but the ultimate goal is reading for meaning irrespective of the language used (Koda & Zehler 2008; Wurr et al. 2009), reading instructions designed in future should have a combination of all three cueing systems and not limited to one type of cues.

### **CONCLUSION**

As the results of the study indicated that there was no significant difference across reading ability and type of miscues, therefore, reading instruction should focus on all three cueing systems as they all integrate to help the reader make sense of the text. Further, an analysis of reading errors will help educators understand the strategies readers utilize when encountering unfamiliar text as well as identifying the skills the reader needs to further improve on.

### **REFERENCES**

- Abeywickrama, R., 2010. An Analysis of Errors in English Writing of Sinhala Speaking Undergraduates. *Sabaragamuwa University Journal*, 9(1), pp.97–114.
- Adams, M.J., 1998. The Three Cueing System. In *Literacy for all: Issues In Teaching And Learning*.
- Almazouri, K.M., 2007. LEARNING TOGETHER THROUGH RETROSPECTIVE MISCUE ANALYSIS : SALEM S CASE STUDY. *Reading Improvement*, pp.153–169.
- Beatty, L. & Care, E., 2009. Learning from their miscues: Differences across reading ability and text difficulty. *Australian Journal of Language and Literacy*, 32(3).
- Bernhardt, E.B., 2011. *Understanding Advanced Second Language Reading*.
- Dhanapala, K.V., 2010. Sri Lankan University Students ' Metacognitive Awareness of L2 Reading Strategies. *Journal of International Development and Cooperation*, 16(1), pp.65–81.
- Donna E. Alvermann, N.J.U. & Ruddell, R.B., 2013. *Theoretical Models and Processes of Reading* 6th editio.,

- EducationWorld, 2014.  
[www.educationworld.com](http://www.educationworld.com).
- Goodman, K. & Goodman, Y., 1976. Learning to read is natural.
- Harding, B. and S., 1985. The Changing Patterns Of Reading Errors And reading Styles From 5-11 Years Of Age.
- Jayasundara, J.M.P.V.K. & Premarathna, C.D.H.M., 2011. A Linguistics Analysis on Errors Committed in English by Undergraduates. *International Journal of Scientific Research and publication*, 1(1), pp.49–50.
- Koda, K. & Zehler, A.M., 2008. Learning to Read Across Languages,
- Kucer, S.B., 2009. Examining the Relationship Between Text Processing and Text Comprehension in Fourth Grade Readers. *Reading Psychology*, 30(4), pp.340–358.
- Martyn Long, C.W., Karen Littleton, T.P. & Sheehy, and K., 2011. *The Psychology of Education* 2nd edition 2nd editio.,
- McKenna, M.C. & Picard, M.C., 2006. Revisiting the Role of Miscue Analysis in Effective Teaching. *The Reading Teacher*, 60(4), pp.378–380. Available at: <http://doi.wiley.com/10.1598/RT.60.4.8> [Accessed August 15, 2014].
- Moore, R.A., Brantingham, K.L. & Nathan, A., 2003. A study of miscues led to reader response and Nathan : A case study in RMA. *The Reading Teacher*, 56(5), pp.466–474.
- Paulson, B.E.J. & Mason-egan, P., 2007. Retrospective Miscue Analysis for Struggling Postsecondary Readers. *Journal Of Developmental Education*.
- ReadWorks, 2014.  
<http://www.readworks.org>. Ritter, C.D. & Chaleff, M.H., 2001. Use of miscue analysis with deaf readers.pdf. *The Reading Teacher*.
- Treiman, R., 2001. *Blackwell Handbook of Linguistics*. , pp.664–672.
- Vaccaro, G., 2012. Turning on the Light Bulb. *ILLINOIS READING COUNCIL JOURNAL*, 40.
- Wurr, A.J., Theurer, J.L. & Kim, K.J., 2009. Retrospective Miscue Analysis With Proficient Adult ESL Readers. *Journal of Adolescent and Adult Literacy*, 52(December 2008), pp.324–333.



## Depression, Anxiety, and Stress in Primary Caregivers of Children with Invisible Disabilities in Sri Lanka

Waahidah Mohamed<sup>1</sup>, Raneesha De Silva<sup>2</sup>\*

<sup>1</sup>National Institute of Business Management, Sri Lanka

<sup>2</sup>Free Yezidi Foundation, Iraq

---

### ARTICLE INFO

#### Article History:

Received Date: 01 July 2022

Accepted Date: 15 September 2022

---

#### Keywords:

Caregivers; Children; Disabilities; Depression; Anxiety; Stress

---

#### Citation:

Waahidah Mohamed, Raneesha De Silva. (2022). *Depression, Anxiety, and Stress in Primary Caregivers of Children with Invisible Disabilities in Sri Lanka*. Proceedings of SLIIT International Conference on Advancements in Sciences and Humanities, (11) October, Colombo, 379 - 383.

---

### ABSTRACT

Children with invisible disabilities such as Autism Spectrum Disorder, Attention Deficit Hyperactive Disorder, speech impairments, and learning difficulties require special support and a diligent caregiving environment to thrive. Primary caregivers have to take on additional roles to provide extra support for children with invisible disabilities while accommodating their professional and personal lives through the process. This research analyzed depression, anxiety, and stress between primary caregivers of children with invisible disabilities and primary caregivers of typically-developing children in Sri Lanka. Data was gathered through an online survey. The sample consisted of 75 primary caregivers between the ages of 23 years to 56 years, which included 38 primary caregivers of children with invisible disabilities and 37 primary caregivers of typically-developing children. The DASS-21 (Lovibond and Lovibond, 1995) was administered to measure depression, anxiety, and stress. The Independent sample t-test was used to compare the mean difference between the two groups of caregivers. The findings did not reveal a significant difference in the levels of depression, anxiety, and stress between primary caregivers of children with invisible disabilities and primary caregivers of typically-developing children. However, regression analysis revealed that parental age had a significant impact on the levels of anxiety among caregivers of children with invisible

---

\* Raneesha, raneesha.d@slit.lk

disabilities. This implies that experience gained with age may reduce anxiety in primary caregivers of children with invisible disabilities.

## INTRODUCTION

Caregiving involves the process of attending to and supporting dependent individuals (Schulz et al., 2016). The role of caregiving is often adopted by family members, health professionals, social workers and even educators, who protect, supervise and directly give care for their dependent individuals (Schulz et al., 2016).

Among all the caregiving roles, taking care of children is one of the most challenging tasks, especially if the child is diagnosed with an invisible disability such as Autism Spectrum Disorder (ASD), Attention Deficit Hyperactivity Disorder (ADHD), speech impairment or a learning difficulty (e.g.: Dyslexia/Dyscalculia/Dysgraphia etc. (Felicia et al., 2022). Caregivers of children with invisible disabilities experience increased levels of challenges in parenting, social constrictions, financial difficulties, and finding suitable treatment and support for their children (Scherer et al., 2019; Davenport & Zolnikov, 2021). The responsibilities of a caregiver, independent of their dependent's care level required, has a major impact on the caregiver's mental health such as increased levels of depression, anxiety, and stress (Masulani et al., 2016; Dhiman et al., 2020), which could lead them to experience compassion fatigue.

Even today, whilst curbing the spread of the COVID-19 pandemic, primary caregivers of children with invisible disabilities were highly burdened (Zahaika et al., 2021). It has been found that parents who experience depression, anxiety and stress have characteristics of irritability, anger, negative coping behavior and exhaustion, which in turn may affect the children under their care (Cocker & Joss, 2016).

This paper discusses the difference in the levels of depression, anxiety, and stress among primary caregivers of children with invisible disabilities and primary caregivers of typically-developing children in Sri Lanka. The findings will be helpful to understand how caregiving impacts the mental health of caregivers in Sri Lankan context and also provide insight on how the community and healthcare professionals can improve caregiver well-being. This is important as the impact caregiving has on the

mental health of primary caregivers is not addressed in Sri Lankan context.

This study aimed to know the differences in the levels of depression anxiety, and stress between biological parents and legal guardians of children with or without invisible disabilities.

### Hypothesis 1

H0 There is no significant difference in the mean scores of levels of depression, between primary caregivers of children with invisible disabilities and primary caregivers of typically developing children.

H1 There is a significant difference in the mean scores of levels of depression, between primary caregivers of children with invisible disabilities and primary caregivers of typically developing children.

### Hypothesis 2

H0 There is no significant difference in the mean scores of levels of anxiety, between primary caregivers of children with invisible disabilities and primary caregivers of typically developing children.

H1 There is a significant difference in the mean scores of levels of anxiety, between primary caregivers of children with invisible disabilities and primary caregivers of typically developing children.

### Hypothesis 3

H0 There is no significant difference in the mean scores of levels of stress, between primary caregivers of children with invisible disabilities and primary caregivers of typically developing children.

H1 There is a significant difference in the mean scores of levels of stress, between primary caregivers of children with invisible disabilities and primary caregivers of typically developing children.

## MATERIALS AND METHODS

The ethical approval for data collection was granted by the National Institute of Business Management Psychology Ethics Review Committee (Ref: 8351696).

This quantitative study with a cross-sectional design recruited participants through convenience sampling method and collected

information through an online survey via social media platforms such as Facebook, Instagram, and email. Participant eligibility for primary caregivers was dependent on the following factors: age between 18 to 65 years, caring for a child between 3 to 18 years, and Sri Lankan nationality. To be considered as a caregiver of a child with invisible disabilities, the child needed to have received a formal diagnosis from a medical professional. Seventy-five caregivers were separated into two groups, depending on if their child has an invisible disability ( $n = 38$ ) or not ( $n = 37$ ).

Demographic information on caregivers' age, gender, education level, civil and employment statuses, income range, role of the primary caregiver (parent, grandparent or legal guardian), and the primary diagnosis of the child were collected, in addition to information on children's ability to care for themselves, and knowledge and experience of the primary caregiver. The levels of Depression, anxiety, and stress were collected through the short version of the Depression, Anxiety and Stress Scale- 21 (DASS-21; Lovibond and Lovibond, 1995). Psychometric measure of DASS-21 showed high internal consistency with a Cronbach's alpha between 0.96 to 0.97 for DASS- Depression, 0.84 to 0.92 for DASS-Anxiety, and between 0.90 to 0.95 for DASS-Stress (Parkitny & McAuley, 2010). The cultural validity for internal consistency had been respectively reported as 0.83, 0.76, and 0.80 (Aththidiye, 2012).

The Spearman Rank correlation, independent sample t-test, and simple linear regression were administered to analyse data via SPSS 25.3

## RESULTS AND DISCUSSION

The majority primary caregivers of this study constituted of mothers. Thirty-eight primary caregivers reported to care for a child with invisible disabilities and 37 participants reported to care for a typically-developing child. The majority of participants (82.7%) were middle-aged (37.17 years;  $SD = 7.8$ ) married females, and the biological parent (89.3%) of the child. Among both groups, 32.7% participants were employed fulltime, but 17.3% of the participants did not receive a monthly income; whereas, 50% of the participants reported receiving a monthly income of Rs. 50,000 and above.

### Depression, Anxiety, and Stress among Primary Caregivers

The overall prevalence of depression, anxiety, and stress were  $M=15.42$  ( $SD=12.51$ ),  $M=14.21$  ( $SD=12.7$ ), and  $M=17.32$  ( $SD=11.6$ ) respectively for primary caregivers of children with invisible disabilities. For primary caregivers of typically developing children, the overall prevalence was reported comparatively lower as depression was  $M=12.92$  ( $SD=10.46$ ), anxiety was  $M=12.16$  ( $SD=8.8$ ), and stress was  $M=14.70$  ( $SD=8.8$ ). Both groups reported mild levels of stress, mild to moderate levels of depression, and moderate levels of anxiety. Therefore, it can be speculated that caring for a child with invisible disabilities may not be the primary reason impacting their mental health, but the influence of other environmental factors such as the COVID-19 pandemic and the current economic crisis could be major contributing factors (Dhiman et al., 2020; Zahaika et al., 2021).

### Group Differences in Levels of Depression, Anxiety, and Stress

A significant difference was not reported for depression ( $M= 15.42$ ,  $SD=12.51$ ;  $M=12.92$ ,  $SD= 10.46$ ),  $t(73) = 0.93$ ,  $p > .05$ ); anxiety ( $M=14.21$ ,  $SD=12.07$ ;  $M=12.16$ ,  $SD=8.87$ ),  $t(73) = 0.83$ ,  $p > .05$ ); or stress ( $M=17.32$ ,  $SD=11.60$ ;  $M=14.70$ ,  $SD=8.80$ ),  $t(73) = 1.096$ ,  $p > .05$ ) between two groups of caregivers. This implies that independent of the child's diagnosis, there was no significant difference, and the findings are in contrast with previous studies (Cocker & Joss, 2016; Masulani et al., 2016).

### Impact of Demographic Factors on Depression, Anxiety, and Stress

The Spearman rank correlation analysis revealed that there was no significant relationship between demographic factors and levels of depression, anxiety, stress, and/or total DASS-21 score for caregivers of typically-developing children. Similarly, there was no significant relationship between demographic factors, depression, and stress among the caregivers of children with invisible disabilities; except, a significant moderate negative correlation was reported between age and anxiety;  $r(38) = -.37$ ,  $p < .05$ . The correlation for age and total DASS-21 score indicated a significant moderate negative relationship  $r(38) = -.37$ ,  $p < .05$ . This finding reveals that age has a relationship with anxiety and could be contributing to the significant relationship between age and total DASS-21 score as well.



A simple linear regression revealed that age predicted anxiety;  $F(1, 36) = 8.47, p < .05$ , with a Beta =  $-.44, p < .05$ . Therefore, it implies that when age increases by 1 unit, anxiety decreases by .44 units. This finding emphasizes on the impact of age as a protective factor to decrease levels of anxiety when caring for children with invisible disabilities. This finding is supported by past research as anxiety may reduce due to the increased amount of knowledge and experience into caregiving. However, this is challenged by Scherer et al., (2019) where they reported that anxiety increased with age because of long-term caregiving and deterioration of primary caregivers' mental health. However, over the years of caregiving, age has shown to be a protective factor in reducing the impact of caregiving on mental health (Tentorio et al., 2020). This may be due to the fact that primary caregivers are more aware and educated on the knowledge of the child's condition and over time, resilience grows (Tentorio et al., 2020). They also learnt to prioritize and pay attention towards their emotional support and individual needs (Tentorio et al., 2020).

## LIMITATIONS

The COVID-19 pandemic and the economic crisis in Sri Lanka may have influenced the caregiver reporting in addition to the challenges of caregiving, at the time of data collection. The majority of the respondents were recruited through social media platforms with English research material. This greatly limits the generalizability of findings.

Future research is recommended to approach participants beyond social media, and to use a psychometric measure which directly assesses compassion fatigue.

## CONCLUSION

This paper provides an understanding on depression, anxiety, and stress among primary caregivers of children with invisible disabilities and typically-developing children. Findings revealed that depression, anxiety, and stress were reported by both groups of primary caregivers, but without a significant difference between groups. Therefore, it can be suggested that depression, anxiety, and stress in primary caregivers of children with invisible disabilities does not primarily stem from having to care for

a child requiring additional care. However, the level of anxiety in primary caregivers of children with invisible disabilities were reported to decrease with increasing years of age. Findings can be utilized to improve the quality of life for both the caregiver and the dependent minor, increase insight to improve efficiency in caregiving, and inform healthcare professionals and policy making on risk and protective factors which contribute to levels of depression, anxiety, and stress among caregivers of children with invisible disabilities.

## REFERENCES

- Aththidiye, R. (2012) Adaptation and Validation of the Depression Anxiety and Stress Scale (DASS21) among Student in the University of Colombo. Annual research Symposium 2012, University of Colombo
- Cocker, F., & Joss, N. (2016). Compassion Fatigue among Healthcare, Emergency and Community Service Workers: A Systematic Review. *International Journal of Environmental Research and Public Health*, 13 (6), 618.
- Davenport, S., & Zolnikov, T. R. (2021). Understanding Mental Health Outcomes Related to Compassion Fatigue in Parents of Children Diagnosed with Intellectual Disability. *Journal of Intellectual Disabilities*, 174462952110136.
- Andrioni, F., Coman, C., Ghita, R. C., Bularca, M. C., Motoi, G., & Fulger, I. V. (2022). Anxiety, Stress, and Resilience Strategies in Parents of Children with Typical and Late Psychosocial Development: Comparative Analysis. *International journal of environmental research and public health*, 19 (4), 2161.
- Parkitny, L., & McAuley, J. (2010). The Depression Anxiety Stress Scale (DASS). *Journal of Physiotherapy*, 56 (3), 204. [https://doi.org/10.1016/s1836-9553\(10\)70030-8](https://doi.org/10.1016/s1836-9553(10)70030-8)
- Scherer, N., Verhey, I., & Kuper, H. (2019). Depression and Anxiety in Parents of Children with Intellectual and Developmental Disabilities: A Systematic

- Review and Meta-Analysis. PLOS ONE, 14 (7).
- Schulz, R., Eden, J., & National Academies of Sciences, Engineering, and Medicine. (2016). Family Caregiving Roles and Impacts. In Families Caring for an Aging America. National Academies Press (US).
- Tentorio, T., Dentali, S., Moiola, C., Zuffi, M., Marzullo, R., Castiglioni, S., & Franceschi, M. (2020). Anxiety and Depression are Not Related to Increasing Levels of Burden and Stress in Caregivers of Patients with Alzheimer's Disease. *American Journal of Alzheimer's Disease & Other Dementias*, 35, 153331751989954.
- Zahaika, D., Daraweesh, D., Shqerat, S., Arameen, D., & Halaweh, H. (2021). Challenges Facing Family Caregivers of Children with Disabilities During COVID-19 Pandemic in Palestine. *Journal of Primary Care & Community Health*, 12, 215013272110430.

**EDUCATION**  
**ENGLISH LANGUAGE & LITERATURE**  
**LAW**  
**MATHEMATICS & STATISTICS**  
**NATURAL SCIENCES**  
**NURSING & HEALTH SCIENCES**  
**PSYCHOLOGY**



<https://sicash.sliit.lk/>



☎ 011 754 4801

✉ [info@sliit.lk](mailto:info@sliit.lk)

🌐 [www.sliit.lk](http://www.sliit.lk)