



**Proceedings of
4th Research Symposium – Faculty of Allied Health Sciences
University of Ruhuna**



“Health for Humanity: Leading the Way”

August 26, 2021

**Faculty of Allied Health Sciences, University of Ruhuna
Galle, Sri Lanka**

RuFARS - 2021

“Health for Humanity: Leading the Way”

**Proceedings of
4th Research Symposium – Faculty of Allied Health Sciences
University of Ruhuna**

August 26, 2021

**Faculty of Allied Health Sciences, University of Ruhuna
Galle**

ISSN: 2659-2029

©RuFARS 2021

Faculty of Allied Health Sciences
University of Ruhuna,
Galle, Sri Lanka

All rights reserved.

Faculty of Allied Health Sciences, University of Ruhuna, Galle, Sri Lanka

Advisory Board

Senior Professor TSD Amarasena, Vice Chancellor, University of Ruhuna
Professor EPS Chandana, Deputy Vice Chancellor, University of Ruhuna
Professor Imendra Kotapola, Dean, Faculty of Allied Health Sciences, University of Ruhuna
Senior Professor S Gunawardena, Faculty of Medicine, University of Ruhuna
Dr. AS Dissanayake, Faculty of Allied Health Sciences, University of Ruhuna
Dr. WVRTDG Bandara, Faculty of Allied Health Sciences, University of Ruhuna
Dr. SK Hettihewa, Faculty of Allied Health Sciences, University of Ruhuna
Dr. KB Gunawardana, Faculty of Allied Health Sciences, University of Ruhuna
Ms. SMEB Weeratunga, Faculty of Allied Health Sciences, University of Ruhuna
Ms. KKPMK De Silva, Faculty of Allied Health Sciences, University of Ruhuna

Editor in Chief

Ms. KAKD Wijesekera

Editorial Board

Prof. Imendra Kotapola
Dr. AS Dissanayake
Dr. WVRTDG Bandara
Dr. HH Peiris
Dr. SK Hettihewa
Dr. KB Gunawardana
Dr. SMTD Sundarapperuma
Dr. RHMPN Rathnayake
Ms. GAM Prasadi
Dr. WBNT Fernando

Chairperson

Dr. HWAS Subasinghe

Joint Secretaries

Dr. BI Wickramaarachchi
Ms. VM Pathiraja
Ms. JAN Sandamali

Treasurer

Ms. SMEB Weeratunga

Organizing Committee

Mr. N Gamage

Ms. MWK Gamage

Ms. HJH Madhushanthi

Mr. TUW Abeygunasekara

Ms. ADSS Karunanayaka

Ms. EH Silva

Ms. P Wijesiriwardane

Ms. KG Jayasekara

Ms. AMSS Amarasiri

Ms. AADS Amarasinghe

Ms. KDSV Karunanayaka

Ms. M Jayasinghe

Ms. KIM De Silva

Ms. UGS Janesha

Ms. LL Sandamali

Mr. WHP Kumara

Ms. CS Lokanwaththa

Ms. MPMK Dias

Ms SMDU Silva

Ms. WSS Madushika

Ms TLI Srilal

Ms. PTA Thilakarathna

Ms. HLK Prabodhi

Ms. GA Jinappriya

Ms. UT Maheshika

Foreword

The 4th Research Symposium (RuFARS-2021) was organized by the Faculty of Allied Health Sciences, University of Ruhuna, Sri Lanka. The abstracts and full papers arisen from diverse disciplines of Allied Health Sciences have been peer reviewed prior to acceptance. The abstracts and full papers have been edited to maintain language accuracy and page limits. Responsibilities of the content text of the abstracts and full papers included in this publication remain with the respective authors. No part of this serial publication will be reported in any form.

When citing the abstracts and full papers published, the serial publication is to be referred to as 'Proceedings of the 4th Research Symposium, Faculty of Allied Health Sciences, 2021, University of Ruhuna'.

Editorial Board

RuFARS-2021

Message from the Keynote Speaker



It is my great pleasure to write this message wishing a successful and productive 4th Ruhuna University Faculty of Allied Health Sciences Research Symposium (RuFARS-2021). It is my privilege to be a part of this prestigious event in the calendar of University of Ruhuna.

Research is searching again and again. Hence, having research symposia regularly encourages the undergraduates and academics in their quest for new knowledge. I congratulate for a relatively young faculty to organize such an academically stimulating research symposium. When I was an undergraduate, we never had these opportunities.

“.....Allied health encompasses a broad group of health professionals who use scientific principles and evidence-based practice for the diagnosis, evaluation and treatment of acute and chronic diseases; promote disease prevention and wellness for optimum health, and apply administration and management skills to support health care systems in a variety of settings.....” (The Association of Schools of Allied Health Professions (ASAHP). <https://www.asahp.org/>).

Evidence-based practice needs up-to-date and relevant evidence. Evidence should be relevant to our country. Hence, you have to identify problems relevant to our country and proceed with organized curiosity coupled with systematic problem solving in finding out answers for those problems. I am sure that every one of you will leave your mark in the history of allied health research in Sri Lanka.

I wish you all the best for a successful programme. Aim High, Dream High. Because “Dream is not that which you see while sleeping, it is something that does not let you sleep” (Dr A P J Abdul Kalam).

Professor Shalini Sri Ranganathan

Professor in Pharmacology and Specialist in Paediatrics

Department of Pharmacology,

Faculty of Medicine, University of Colombo, Sri Lanka

Message from the Vice Chancellor and the Chief Guest



As the Vice Chancellor of University of Ruhuna, it gives me immense pleasure to send this message to the annual Research Symposium of the Faculty of Allied Health Sciences, University of Ruhuna (RuFARS-2021). Faculty of Allied Health Sciences is the youngest faculty of the University of Ruhuna. It is functioning with the aim of producing good quality, technically competent health professionals to the country. Therefore, the Faculty of Allied Health Sciences has a national responsibility to fulfil the increasingly demanded and highly trained health care professionals to cope with the trends in the modern

healthcare system.

There is an emerging need for allied health professional to be trained in advance research capabilities. Accordingly, organizing annual research symposium could be identified as a great initiative taken by the Faculty of Allied Health Sciences. Research symposia provide opportunities for young researchers to improve their research abilities, communication skills and get exposed to peer reviews. Research activities have great potential to create graduates with enriched critical thinking and analytical skills. This symposium is not just a platform for researchers and scholars to disseminate their findings to a wider community but also is an important forum for encouraging an interactive discussion and sharing insights with their peers, healthcare practitioners and policy makers.

The theme of RuFARS-2021 is "*Health for Humanity: Leading the way*". Ensuring the health and well-being of populations have been recognized as a major driving force to poverty eradication, achieving sustainable development, contributing to economic growth and prosperous communities. The United Nation has defined *ensuring healthy lives and promote well-being for all at all ages* as the third Sustainable Development Goal. Health is also an inalienable human right according to the Universal Declaration of Human Rights.

However, it is crucial to ensure equitable access to quality health services and to strengthen health systems with the ultimate goal to achieve better health outcomes, particularly for women, children, the poor and the marginalized. Significant development challenges remain in the health sector, including poverty, insufficient resources for health, changes in spectrum of diseases, malpractice, and poor health knowledge. These global health challenges should be overcome through the clear goals and strategies. Currently, the world is facing a global health crisis unlike any other, Covid-19 is spreading all over the world destabilizing the global economy and affecting the lives of billions of people around the globe. In that context it is vital to change the trajectory of health for humanity incorporating required modifications. In that context, this multidisciplinary forum has a great potential to stimulate a productive scientific discussion for exploring the direction to achieve the goals in national health system.

I would like to take this opportunity to thank the organizing committee led by the Dean, Faculty of Allied Health Sciences and the Chairperson, RuFARS-2021. The great effort of the

organizing committee to organize this Research Symposium for the fourth consecutive year under the constraints of the Covid-19 pandemic should be profoundly appreciated.

I wholeheartedly wish the 4th Research Symposium of the Faculty of Allied Health Sciences, University of Ruhuna (RuFARS-2021) a great success.

I look forward to witnessing an exciting and successful symposium.

Senior Professor T S D Amarasena

Vice Chancellor

University of Ruhuna

Message from the Dean, Faculty of Allied Health Sciences



I am indeed delighted as the Dean, Faculty of Allied Health Sciences, University of Ruhuna to write this congratulatory message to the proceedings of the 4th Research Symposium of the Faculty of Allied Health Sciences, University of Ruhuna, RuFARS-2021 under the theme “Health for Humanity; Leading the way”. Due to the current pandemic with Covid-19, this time, the symposium is organized in a fully virtual mode.

RuFARS is a multidisciplinary research symposium which covers all fields of Allied Health Sciences. The symposium proceedings include findings of many research projects from Faculty of Allied Health Sciences, University of Ruhuna and from other Higher Education Institutes. Over the last few years, undergraduate research work has immensely contributed to strengthen the research culture and it is inspiring to notice that the majority of the publications in the proceedings of fourth research symposium have showcased the research potential and the talents of the graduating students. From this effort, we intend to set the tone to initiate more collaborative research at national and global levels. This research conference is an ideal platform to make connections and hopefully, you all will take this opportunity to interact and develop friendly relationships, establish networks and to explore win-win situations.

My sincere gratitude goes to the Vice Chancellor of the University of Ruhuna for his unceasing moral support to organize this event. The symposium would not have been possible without the enthusiasm and hard work of a number of colleagues. I would like to express my appreciation and gratitude to Dr. Sewwandi Subasinghe, Chairperson and all the committee members of the RuFARS-2021 for their untiring efforts to make it a reality amidst the Covid-19 pandemic and many other challenges. The excellent contribution of the reviewers and the members of the editorial board is highly appreciated.

I take this opportunity to congratulate all the presenters and wish them all very best of luck. It is a great pity that we cannot hold a face to face symposium this year due to the critical situation in the country and the Covid-19 guidelines issued by the government. But you will still find an exciting and scientifically challenging meeting virtually.

Stay healthy and let us hope for the best.

Professor Imendra Kotapola

Dean

Faculty of Allied Health Sciences

University of Ruhuna

Message from the Chairperson RuFARS-2021



I am delighted and honoured to bring this message to the 4th Research Symposium of the Faculty of Allied Health Sciences, University of Ruhuna, RuFARS-2021. As the chairperson of the organizing committee, it is my great pleasure and privilege to welcome you all. Despite all the challenges due to the prevailing situation with Covid-19, we have become fortunate to conduct the faculty research symposium this year as well making it a calendar event of our faculty which is the most exciting and the graceful event. This year the symposium is hosted by the Department of Pharmacy with the collaboration of all the academics and non-academic members of the faculty. The symposium is conducted virtually providing a platform for academics, undergraduates and healthcare professionals to disseminate their valuable research findings and insights on new challenges facing in health-related disciplines. Our theme of “Health for humanity; Leading the way” was created to leverage this amazing gathering of professionals to bridge the gaps in different health science fields and to connect the gaps in a new and fresh way.

As the chairperson of the symposium, I know that the success of the symposium depends eventually on the many people who have worked with us, in planning and organizing the event. I'm constantly amazed by the support given by the Vice Chancellor, Snr. Prof. Sujeewa Amarasena and our Dean, Prof. Imendra Kotapola, who have a very clear desire to upgrade research and allied health sector. In particular, I thank them for their advice and brilliant suggestions on organizing the symposium. I extend my heartfelt gratitude and appreciation to Prof. Shalini Sri Ranganathan, Professor in Pharmacology at the Faculty of Medicine, University of Colombo for enlightening the symposium, accepting our invitation to be the keynote speaker. And all recognition should go to the organizing committee who have worked extremely hard on the details of important aspects of the symposium. A note of appreciation to the panel of reviewers for their thorough and timely reviewing of the papers.

I thank all the presenters, for enriching the symposium by your presence. As it is a tradition with the symposium, I hope you will enjoy the content, get new ideas, and network even with the limited opportunities with the virtual platform.

I am sure that this symposium will bring the lavish memories to all participants in this year to follow. I wish RuFARS-2021 a great success and wish you all a fruitful symposium.

Dr. H W A S Subasinghe
Chairperson, RuFARS-2021

Contents

Full Papers

FP 01 - Risk Factors and Comorbidities Associated with Fragility Hip Fracture among Fragility Hip Fracture Patients Admitted to Teaching Hospital Karapitiya

Abeygunasekara T., Lekamwasam S., Lenora J., Alwis G. 17

FP 02 - The Impact of Gender and Age on Health and Quality of Life of Older People in Galle District, Sri Lanka

De Silva K., Liyanage C., Wijesinghe C., Perera B. 27

Oral Presentations

OP 01 - Formulation and Evaluation of Herbal Underarm Gel

Samarathunga S.A.D.I.H., Wijesekara K., Napagoda M.T., Wijeyaratne W.M.D.G.B. 36

OP 02 - Perceived Nursing Errors and Sleep Quality among Shift Working Nursing Officers in Two Selected Government Hospitals, Sri Lanka

Nawarathne L.C., Amarasekara A.A.T.D. 37

OP 04 - A Study on the Burnout of Ward Nurses during the Covid-19 Pandemic in the Western Province, Sri Lanka

Fernandopulle M.K., Hanwellage D.N.A., Jayawardana Kankanamge S.S., Perera J.A.S.M.B., Fernando N.M. 38

OP - 04 Perception and Awareness on the Practices of Obtaining an Informed Consent Prior to Medical Intervention among Hospitalized Patients in Puttalam District, Sri Lanka

Perera J.A.H.M.S., Perera J.A.S.M.B. and Kaldera H.P.S.R. 39

OP - 05 Social Support and Quality of Life of Institutionalized and Non-institutionalized Older People: A Comparative Cross-sectional Study

Wickramasinghe D.A., Perera B., Gamage M.W.K. 40

OP 06 - Phytochemical, Proximate and HPTLC Analysis of *Plectranthus zeylanicus* Benth (Iriweriya) Grown in Sri Lanka

Hapuarachchi S.D., Silva P.D.S.A., Kodithuwakku N.D., Perera P.K. 41

OP 07 - Prevalence and Perceived Associated Factors of Lower Back Pain in Nurses, Gampaha District, Sri Lanka

Kannangara A.D., Rodrigo C.D., Jayaram U., Amarasekara L.B.I.S., De Silva S. 42

OP 08 - Antibacterial Potential of *Myristica fragrans* (Nutmeg) Pericarp Extract Against Selected Bacterial Strains

Weerakoon W.M.T., Perera W.P.R.T., Wanigasekara D.N. 43

OP 09 - Three Newly Designed Methods to Calculate Percentage Haemolysis of Red Cell Concentrates before Transfusion

Fernando C.A., Hewamana U.I., Dissanayake D.M.D.T., Rathnaweera S., Samanthilake W.A., Kuruppu K.K.S., Jayasekara J.K.M.B. 44

OP 10 - Effect of Metal Ions and Detergents on *In vitro* Protease Inhibitory Activity of Black Gram Cultivated in Sri Lanka

Jayasinghe J.D.M.S., Chandrasena U.S.D., Kumari K.D.K.P., Rajapakse S., Suresh T.S...... 45

OP 11 - Coping Strategies among Patients with Cancer: A Cross-sectional Study done in Teaching Hospital Karapitiya, Southern Sri Lanka

Weeratunga E., Senadheera C., Hettiarachchi M., Perera B...... 46

OP 12 - The Patterns of Breakfast Consumption and Their Association with Concentration and Memory of Ordinary Level Students of Christ King College, Pannipitiya

Pirannavan R., Prabodhi A.K.A., Perera K.B.K.C., Samaranayake D.B.L...... 47

OP 13 - Risk Assessment of Bioaccumulation of Toxic Metals in Rice Grains (*Oryza sativa*) in a CKDu Endemic Area; A Study in Mihintale Division, Sri Lanka

Perera P.L.R.A., Perera W.P.R.T., Liyanage J.A...... 48

OP 14 - Assessment of Health Risk using the Daily Intake of Nephrotoxic Trace Metals via Drinking Water: A Case Study in Rideemaliyadda-South, CKDu Endemic Area, Sri Lanka

Karunadasa H.T.D.R., Botheju W.S.M., Dayananda M.D.N.R., Perera W.P.R.T., Liyanage J.A...... 49

OP 15 - Prototype Design of a Monorail Delivery Robot for Local Hospitals of Sri Lanka

Senadheera S.M.T.D., Pramodi J.P.M., Seneviratne R.W., Kumara K.J.C...... 50

OP 16 - Incidence of Falls and its Association with Quadriceps Muscle Strength among Institutionalized Older People: A Cross-sectional Study from Colombo District

Kandage I.M., Pramodhya L.G.O., Perera G.A.D...... 51

OP 17 - Caregivers' Perception on Barriers and Facilitators for Provision of Care for Residents in Aged Care Homes in Galle District: A Qualitative Study

Gamage M.W.K., Sundarapperuma S.M.T.D., Madushanthi H.J.H., De Silva K.K.P.M.K., Nirmani K.G.P...... 52

OP 18 - The Role of Physical Activity on Physical Fitness and Functional Ability in Community-dwelling Older People in Western Sri Lanka: A Structural Equation Model

Wickramarachchi B., Siop S., Perera B., Perera R...... 53

OP 19 - Depression, Anxiety, Stress and Perceived Mental Healthcare Need of Sri Lankan Undergraduates Studying in Selected Countries Affected by Covid-19

Amarasingha A.A.D.S., Peiris H.H., Amarasingha A.A.B.N...... 54

OP 20 - Maternal Factors, Cord Lipids and C-reactive protein as Determinants of Foetal Growth in Infants Born in a Teaching Hospital, Sri Lanka

Kamila M.A.F.R., Hewawasam R.P., de Silva M.H.A.D., Iresha M.A.G...... 55

OP 21 - Psychological Experiences of the Patients with Colorectal Cancer at Apeksha Hospital, Maharagama

Mannaperuma D.K., Ahalagolla A.M.K.N., Nilmini K.H.G., Weerathunga D.W.K.C.,

Saumika M.A.R., De Silva B.S.S. 56

OP 22 - Perceived Quality of Healthcare among Residents in Aged Care Homes in Galle District-A Qualitative Study

Madushanthi H.J.H., De Silva K.K.P.M.K., Gamage M.W.K., Sundarapperuma S.M.T.D.,

Nirmani K.G.P. 57

OP 23 - Phytochemical Analysis, In vitro Antioxidant and Sun Screening Activity of Different Solvent Extracts Obtained from *Bauhinia racemosa* (maila) Leaves Grown in Sri Lanka

Hettihewa S.K., Piyaarathna M.I.P. 58

OP 24 - The Cross-cultural Adaptation of the Begley and Glackens's Assertiveness Scale for use with Nursing Students in Sri Lanka

Kumara W.G.C., Warnakulasuriya S.S.P. 59

Poster Presentations

PP 01 - Knowledge about Postpartum Psychiatric Illnesses among Antenatal Mothers in Teaching Hospital, Mahamodara

Ranasinghe R.K.K., Jayasekara A. 61

PP 02 - A Study on Gap between Theoretical Knowledge and Clinical Skills as Perceived by Student Nurses in a Private Nursing School in Gampaha District, Sri Lanka

Thevarasa D., Shaffaaf F., Oshmi K.H., Warnakulasuriya K.C., Nanayakkara K.C. 62

PP 03 - Parents' Perceptions about their Involvement in Pre-school Aged Children's Education in Sri Lanka: A Qualitative Study

Ekanayake E.H.M.R.K., Mudiyanse R.M., Wickramasinghe V.P. 62

PP 04 - Knowledge and Practices towards Dementia Care among Undergraduate Nurses in a Private Healthcare Institute in Sri Lanka

Thumbowila C.L., Fathimath F., Randeniya S., Sameera A.G.L.A. 64

PP 05 - Awareness and Attitudes towards First Aid on Road Traffic Accident among General Public in Gampaha District, Sri Lanka

Perera J.A.S.M.B., Siyambalapitiya M.C., Fernando M.A.R., Kaldera H.P.S.R. 65

PP 06 - Incorrect Uses of Herbal Medicine and Study of Consequences: A Review

Udahapuvinda B.M.M.S.H.K., Weerasooriya W.M.B. 66

PP 07 - Knowledge, Attitudes and Behavioural Changes towards Covid-19 among General Public: A Cross-sectional Study Online Survey

Siyambalapitiya M.C., Perera J.A.S.M.B., Fernando M.A.R., Fernando N.M., Balakrishnan-Prashanth R., Weerasekara D.A.P.R. 67

PP 08 - Pharmacognostical Study and Antacid Potency of Aqueous Extract of *Desmodium triflorum* Linn

Chathurika M.G.S., Jayasuriya W.J.A.B.N., Arawwawala L.D.A.M. and Suresh T.S. 68

PP 09 - Analysis of Cultural Encounter of the Senior and Junior Student Nurses

Senarathne H.S., Meegoda M.K.D.L. 69

PP 10 - Knowledge, Attitude and Practices Regarding Nutrition Labels in Ready-to-eat Pre-packaged Solid Food among Government Employees

Fernando M.G.D.V., Fernando M.P.S., Fernando W.W.G.M., Pathirana A.C.A. 70

PP 11 - Knowledge on Practice of Phlebotomy among Nursing and Biomedical Students in Gampaha District, Sri Lanka

Fernando E.S., Kuruwitage G.S., Rathnayake M., Das C.V.¹, Mahalingam N. 71

PP 12 - Assessing Knowledge, Practice and Usage of Pain Relievers among Students in a Private Educational Institute in Sri Lanka

Adhikaram A.M.S.T., Rajaratnam S., Chathurangani U.L.H., Mahendran N., Yapa Y.M.A.C., Fernando W.J.I. 72

PP 13 - Knowledge and Practices of Foot Care among Patients with Diabetes Mellitus in the Asian Countries: A Systematic Review

Dilrukshi K.K.J., De Silva B.S.S. 73

PP 14 - Awareness and Experience about Government Pharmaceutical Pricing Regulations on Medication Usage of Patients with Chronic Non-communicable Diseases

Prasadi D.G.P., Dhanarisi H.K.J., Fahim A.C.M., Pathiraja V.M. 74

PP 15 - Prevalence of Snake Envenomation History among Patients of Chronic Kidney Disease of Unknown Origin in Wilgamuwa Divisional Secretariat, Matale District, Sri Lanka

Erandika H.G.N., Basnayake B.M.D.B., Nanayakkara N. 75

PP 16 - Assessing the Awareness Regarding the Risk Factors of Cervical Cancer among Women in Gampaha District, Sri Lanka

Devindini P.A.D.O., Sameetha F., Amarasena L.B.I.S., Weerakoon N. 76

PP 17 - Nurses' Perception towards the Use of Advanced Medical Devices in Critical Care Units

Weerabahu R., Dharmasiri U., Wickramasinghe M., Sirinilame S., Sriyani, K.A. 77

PP 18 - Formulation of Antioxidants Rich Herbal Cream using Leaf Extract of *Ocimum tenuiflorum* (krishna thulasi) and Evaluation of *In vitro* Antioxidant Activity

Hettihewa S.K., Sankalpana L.P.S. 78

PP 19 - Evaluation of *In vitro* Anti-inflammatory Activity of a Formulation Developed by Rhizome of *Curcuma zedoaria*

Ileperuma K.G., Upeksha S.D.R., De Silva H.P.D., Samanmali B.L.C., Jayasuriya W.J.A.B.N., Herath H.M.D.R. 79

PP 20 - The Perception and Preference for Online Education among Final Year Undergraduates during Covid-19 Pandemic in Selected State Universities in Western Province, Sri Lanka	
<i>Upeksha S.H.D., Gamage M.A.M.N.</i>	80
PP 21 - The Correlation between Falls Incidence and Quadriceps Muscle Strength of Patients with COPD Presented to National Hospital for Respiratory Diseases, Welisara and Chest Clinic at Medical Research Institute Sri Lanka	
<i>Gordon L.A., Sandali Malsri D.G., Wijesiriwardana V.R., Perera G.A.D.</i>	81
PP 22 - Prevalence of Antimicrobial Resistance among <i>Staphylococcus aureus</i> Isolates from Clinical Samples in Teaching Hospital Mahamodara	
<i>Sufna M.S.F., Weerasinghe N.P.</i>	82
PP 23 - Effects of the Presence of Pus Cells in Seminal Fluid Samples on Sperm Motility and Morphology in a Group of Males who attended to Subfertility Clinics in Galle District	
<i>Kadahetti K.P., Rodrigo M., Fernando H.H.L.K.</i>	83
PP 24 - Does Sri Lanka Need to Reshape the Education for Substance Use Prevention in Schools?	
<i>Jayamaha A.R., Dharmarathna H.H.N.D., Ranadeva N.D.K., Nawarathne L.C., Herath H.M.N.D.M., Buddhini D.G.H., Samarakoon D.N.A.W., Arachchi A.M.P.S., Senerath S.N., Darshana A.T., Samarasinghe K.L., Senanayake B., Welagedara L., Fernando S.S.N.</i>	84
PP 25 - Evaluation of Cytotoxic Effects in Aqueous Herbal Extracts Obtained from <i>Psidium guajava</i>, <i>Garcinia quaesita</i> and <i>Cinnamomum verum</i> Using Brine Shrimp Assay	
<i>Wijenayka D., Bulugahapitiya V., Jayasinghe S.</i>	85
PP 26 - Prevalence of Risk Factors of Osteoporosis among a Group of Middle-aged Premenopausal Women in Sri Lanka	
<i>Subasinghe H.W.A.S., Lekamwasam S., Ball P., Morrissey H., Waidyaratne E.I.</i>	86
PP 27 - Association between Attitudes on Food Advertisements, Eating Behaviour and BMI among Adolescent Boys in a Selected School in Colombo	
<i>Gimhan J.S., Fonseka G.O.M.S., Gooneratne K.M.A., Seneviratne S.N.</i>	86

**Full Papers on Postgraduate Studies Completed by the
Academic Staff Members of the
Faculty of Allied Health Sciences, University of Ruhuna**

FP 01

Risk Factors and Comorbidities Associated with Fragility Hip Fracture among Fragility Hip Fracture Patients Admitted to Teaching Hospital Karapitiya

Abeygunasekara T.^{1#}, Lekamwasam S.², Lenora J.³, Alwis G.⁴

¹*Department of Nursing, Faculty of Allied Health Sciences, University of Ruhuna, Sri Lanka*

²*Department of Medicine, Faculty of Medicine, University of Ruhuna, Sri Lanka*

³*Department of Physiology, Faculty of Medicine, University of Ruhuna, Sri Lanka*

⁴*Department of Anatomy, Faculty of Medicine, University of Ruhuna, Sri Lanka*

#Corresponding author: thilinauwa@ahs.ruh.ac.lk

Abstract

Background: Hip fracture, the most sinister clinical outcome of osteoporosis, is associated with disability, hospitalization, multi-morbidity and death. Many Asian countries lack an effective and coordinated system to detect high fracture risk patients early.

Objective: To identify risk factors and comorbidities associated with hip fracture (HF) among patients admitted to Teaching Hospital Karapitiya (THK).

Methods: Patients with incident fragility HF (n=180) admitted to THK and age and sex matched 348 subjects free of HF selected from the neighborhood of HF patients were included in this case-control study. Only new hip fractures resulted from falls of standing height or less were included. Hip fractures due to heavy injuries were excluded. Data were collected using an interviewer-administered questionnaire.

Results: The two groups were similar with regards to smoking, alcohol consumption and the usage of glucocorticoids. The prevalence of any type of previous fragility fracture (7.8% vs 3.4%) and family history of fragility fracture (8.9% vs 3.4%) were higher in the HF patients ($p<0.05$ and $p<0.01$). The 66.7% of HF patients had one or more comorbidities (83.9%, $p<0.01$). The HF patients had a greater prevalence of comorbidities such as peripheral vascular disease, cerebrovascular disease, peptic ulcer disease, liver diseases, neoplasm, hypertension, bronchial asthma, vision impairment and hearing impairment at the time of hospitalization ($p<0.01$).

Conclusions: This study revealed several risk factors of HF in the local population. Such information can be used in the development of a risk score to detect those with high fracture risk in the local population.

Keywords: Comorbidity, Hip fracture, Risk factors, Sri Lanka

Background

Hip fracture (HF) is associated with permanent disability, hospitalization, increased morbidity and death. It is the most sinister osteoporotic fracture seen among elderly people (1-5). The lifetime risk of HF is higher in women than in men and HF rate increases exponentially, beyond

50 years in both genders (1, 6-8). The lifetime risk of HF is much higher in white women and men compared to their black counterparts (1, 9).

The average length of hospital stay and overall bed use are higher with HFs when compared to pathological vertebral fractures. Mortality is higher during perioperative period and only a lesser number of older patients regain their pre-fracture mobility (10). The mortality rate of HF is increased with age (1, 7, 8). Also high proportion of patients need long term health care for their survival (3, 4, 11, 12).

The incidence of fragility hip fracture (FHF) is increasing, globally, due to the longer life expectancy of the population. The total number of HF worldwide was 1.7 million by 1990 (13, 14) and it could exceed 21 million in 2050 (14, 15). Identification of high fracture risk patients and offering timely measures to reduce fracture risk is the major strategy to tackle this problem (16). Identification of high-risk patients is partly based on clinical risk factors and these risk factors are likely to vary in different populations. Populations differ with regards to genetic composition, anthropometry, nutrition, social habits and physical activities and all these factors play a role in risk prediction (17).

Different methods are used to assess the risk of fracture. In general, they include clinical risk factors and measures of skeletal mass such as bone mineral density (BMD) and trabecular bone score (TBS). BMD is the main factor of bone fragility especially when HF is taken to consideration (18, 19). The calculation of fracture risk is based on BMD and clinical risk factors. However, to improve the accuracy of estimations, other risk factors such as risk of falling also need to be taken into account (20-24). More than 90% of HFs are due to falls (25-28). Therefore, factors that enhance the risk of falling and protective measures during a fall also need to be considered (6, 29).

The risk factors of fractures are many and include those associated with low BMD and falls such as low body mass index (BMI), past fragility fracture (FF), age at menarche, multiparity of women, early menopause, smoking, low vitamin D, use of glucocorticoids, excessive alcohol intake, caffeine intake, impaired physical activity, parental/family history of FFs, long-acting benzodiazepines, impaired vision, altered cognitive function and comorbidities (5, 21, 30-45).

Previous studies have estimated that in-hospital mortality for a patient with a HF is between 4% and 12% (46-52) whereas 1 year mortality is 12–37% (46-58). Studies have shown that comorbidity is a determinant of both in-hospital and at 1 year mortality following a HF. In that some of the previous studies consider the disease or diseases which is/are currently presented with the patients (46-48, 55, 57-61) and others consider the number of co-morbidities whether none, one and two or more, (46, 48) both types of studies found that those factors are independently associated with mortality.

According to all the predictions, Asian countries would have high proportion of the older people and HFs. Early identification is the key to reduce the impact of HF on healthcare system and to lessen the socio-economic burden. Many Asian countries lack an effective and coordinated system to detect high fracture risk patients early and refer them for appropriate treatment. HF risk factors are not well recognized in these countries and more studies are necessary to increase national awareness across countries in order to reduce the HF incidence. The aim of this study was to identify the risk factors and comorbidities associated with HF among patients admitted to a tertiary care facility in Southern Sri Lanka. Also the study was done to assess the impact of the comorbidities on the type of management and the outcome measures such as health related quality of life (HRQOL) and activities of daily living (ADL).

Methods

This case-control study was done in the Southern province of Sri Lanka and the study was approved by the Ethics Review Committee of the Faculty of Medicine, University of Ruhuna. The study was conducted at Teaching Hospital Karapitiya (THK) which is the only tertiary referral center in the Galle district. The principal investigator visited relevant wards (orthopedic,

surgical and acute medical) regularly and patients were recruited after obtaining informed written consent either from patients or their immediate family members.

One hundred and eighty patients with incident FHF admitted consecutively to THK in Galle were included in the study. Men and women who were 50 years and older and who were admitted with the diagnosis of new HF were recruited. Subjects with traumatic HFs which resulted from falling from heights and traffic accidents were excluded. Further those with pathological fracture (e.g., cancer) were also excluded from the study. Those readmitted due to the same fracture were also excluded. Patients were requested to bring two people of same sex and age (± 5 years) from their neighborhood (with the radius of 500 meters) to be considered for controls. Those with HF or radiologically confirmed vertebral fracture were excluded. A detailed history was obtained and examination was performed to detect past HFs and the presence of comorbidities. Previous documents including diagnosis cards were used to gather information.

The participants (cases and controls) were interviewed using a pre-tested, interviewer administered questionnaire to assess socio-demographic characteristics, general health and other clinical data. The questionnaire was designed to assess the risk factors and comorbidities. HF patients were interviewed before discharge from the hospital and those who were controls were interviewed at times convenient to them.

A detailed history was obtained and a limited examination was performed in both groups. Previous documents including diagnosis cards were used to gather information. Also the laboratory reports in the case notes were perused to gather information. Fasting blood sugar (FBS) and lipid profile were done in all study subjects. Assays were done in the Department of Medicine, Faculty of Medicine, University of Ruhuna and each test was performed in triplicates to ensure the accuracy of test results.

Data analysis

Data were analyzed using the statistical package; SPSS software version 20.0. Results were presented as numbers (percentages) for categorical variables and mean (SD) and median (IQR) for numerical variables depending on the distribution. Mean values between the two groups were compared by the independent samples t-test. Both relative risk (RR) and odds ratio (OR) for the risk estimation were calculated. Different groups were compared by ANOVA (numerical) or Chi-square test and odd ratios were calculated to determine the association with risk factors.

Results

A group of 180 patients (149 women, 82.8%) and 348 control group (290 women, 83.3%) were included in the case-control study done in the Southern province of Sri Lanka. The patients and controls were in the age range of 50-93 and 50- 89 years, respectively. Mean (\pm SD) ages of patients and controls were 77.0 (\pm 9.1) and 73.7 (\pm 7.8) years, respectively. Almost 90% (n= 161) of FHF's occurred due to falling from standing height and all the others were spontaneous FHF's. The incidence of HF was 4.8 times higher in women (82.8%) than men (17.2%). Only 59.4% patients were managed surgically. Of the 73 patients who did not undergo surgery, 36 patients did not give consent for surgery because either patients or their family members were unwilling for surgery. Ninety four percent of patients were undergone surgery under the spinal or epidural anesthesia while others had general anesthesia. During the follow-up of 12 months post-fracture, 33 patients died (including in-hospital deaths). The common causes of death included pneumonia (n=13), ischemic heart disease (n=8), cardiac failure (n=5), pulmonary embolism (n=2), sepsis (n=3) and acute renal failure (n=2).

The two groups were similar with regards to smoking, alcohol consumption and the usage of glucocorticoids. The prevalence of any type of previous FF and family history of FF were higher in the HF patients (Table 1). These elderly FHF patients had a high prevalence of

comorbidity with 66.7% having one or more of the comorbidities listed in Table 2. Apart from ischemic heart disease, diabetes mellitus and hyperlipidaemia, HF patients had a greater prevalence of other comorbidities at the time of hospitalization (Table 2). In-hospital mortality and mortality within one year after discharge were 2.8% and 15.6%, respectively. Both types of mortalities were significantly increased with the presence of one (In hospital mortality= 20%, mortality within one year after discharge =32.1%) or more comorbidities (In hospital mortality= 80%, mortality within one year after discharge =53.6%) in the FHF patients ($p<0.01$). The two groups were similar in mental status, but control group had better HRQOL and ADL than hip fracture patients (Table 3).

Table 1: Risk factors of FHF patients and controls

Characteristic	Patients (n=180) N (%)	Control group (n=348) N (%)
History of fragility fracture	14 (7.8)*	12 (3.4)
Family history of fragility fracture	16 (8.9)**	12 (3.4)
Smoking	14 (7.8)	22 (6.3)
Alcohol consumption	19 (10.6)	30 (8.6)
Use of Glucocorticoids	51 (28.3)	73 (21.0)

N- Number; * Significant at the $p<0.05$ level; ** Significant at the $p<0.01$ level

Table 2: Comorbidities of FHF patients and controls

Characteristic	Patients (n=180) N (%)	Control group (n=348) N (%)
Comorbid Conditions		
IHD	8 (4.4)	62 (17.8)**
PVD	52 (28.9)**	3 (0.9)
CVD	11 (6.1)**	6 (1.7)
Dementia	12 (6.7)	17 (4.9)
COPD	20 (11.1)	28 (8.0)
Rheumatic diseases	6 (3.3)	21 (6.0)
Peptic ulcer disease	18 (10.0)**	11 (3.2)
Liver disease	10 (5.6)**	3 (0.9)
Diabetes Mellitus	36 (20.0)	163 (46.8)**
Renal diseases	4 (2.2)	6 (1.7)
Neoplasm (Benign or malignant)	4 (2.2)**	0 (0.0)
Hypertension	69 (38.3)**	49 (14.1)
Hyperlipidemia	13 (7.2)	81 (23.3)**
Bronchial Asthma	25 (13.9)*	27 (7.8)
Vision impairment	30 (16.7)*	36 (10.3)
Hearing Impairment	15 (8.3)**	10 (2.9)
Number of comorbid conditions		
0	60 (33.3)**	56 (16.1)
1	64 (35.6)	258 (74.1)**
2+	56 (31.1)**	34 (9.8)

N- Number

* Significant at the $p<0.05$ level ** Significant at the $p<0.01$ level

IHD- Ischemic heart disease, PVD- Peripheral vascular disease, CVD-Cerebrovascular diseases, COPD-Chronic obstructive pulmonary disease

Table 3: Trends of SF 36, BI and MMSE among FHF patients and controls

	Patients (n=180) Mean (SD)	Control group (n=348) Mean (SD)
SF 36	(n=175)	(n=348)
SF36 Physical	9.2 (3.8)	58.0 (18.8)**
SF 36 Psychological	12.8 (3.3)	70.5 (15.8)**
BI	(n=180)	(n=348)
	96.8 (5.1)	98.0 (4.5)**
MMSE	(n=180)	(n=348)
	25.6 (5.5)	25.3 (3.8)

** Significant at the $p < 0.01$ level

Discussion

This study revealed several factors that are associated with HF in older people. Patients with a past history or family history of FF were at increased risk of HF. Peripheral vascular disease (PVD), cerebrovascular diseases (CVD), peptic ulcer disease, liver disease, neoplasm, hypertension, bronchial asthma, vision impairment and hearing impairment were predisposed to HF.

The history of FF has been identified as a risk factor of subsequent fracture in many studies and the high risk persists even after adjusting for BMD (28, 42, 62-67). Studies have shown that the risk of subsequent fracture is increased with the history of a previous fracture (36, 38, 62, 64, 65, 68-70).

The finding that a family or maternal history of FF increases the risk of HF agrees with the observations made in previous studies. A family history of HF is connected with increased risk of HF in both men and women (42, 65). Apart from fracture, family history of osteoporosis is also associated with increased risk of HF (5, 71). A woman with maternal history of HF, is at two times greater risk of HF when compared with a woman without such maternal history (36). Current or previous smoking is considered a risk factor for future fracture including FHF (38, 72-75). Also the risk of HF is increased in parallel with the age of the smoker (73). Smoking increases risk of fracture in both men and women (42, 44, 73, 76-78) while the lifetime fracture risk is higher in male smokers (79, 80). The cessation of smoking tends to decrease the high fracture risk associated with smoking (75, 79).

In the current study no significant association was found between fracture risk and smoking and this could be due to several reasons. It could simply be due to chance and it is also possible that the small sample size in the current study would have limited the power of the study to reveal such association. This observation, however, is consistent with several studies which failed to find an association between smoking and fracture risk (35, 36, 66, 81-83).

In previous studies alcohol consumption was found to be associated with an increased risk of HF (35, 38, 84-86). Excessive alcohol intake is associated with an increased risk of HF in white men and women and as well as in Asians (5, 35, 38, 42, 72, 85, 87-89). The risk between alcohol consumption and fracture is dose-dependent in which higher exposure increases the risk (38, 62, 63). In contrast some researchers found occasional alcohol consumption and moderate alcohol consumption to be associated with a low risk of HF (38). Also they had higher BMD (90, 91). The finding of the current study related to alcohol are consistent with the findings of previous studies (36, 92).

The impact of smoking and alcohol consumption on risk of HF varies geographically (75). Compared to the Western countries, the prevalence of smoking among women in Asia is relatively low (38). Similarly, prevalence of alcohol consumption is lower among women in

Asian countries (38). Therefore, smoking and alcohol consumption are associated with relatively small effects on HF risk in Asian women (38).

In contrast to other investigators, the use of glucocorticoids was not associated with HF risk in the current study. Since the use of glucocorticoid in the community was low, the establishment of an association between glucocorticoid use and fracture was not possible. The low prevalence of glucocorticoid use is the most likely reason for the lack of association seen between these two variables in this study. The use of glucocorticoids has been recognized as an important risk factor of osteoporosis and fractures (42, 62, 65, 93). The oral glucocorticoid therapy leads to reduction in BMD and a rapid increase in the risk of fracture after the initiation of therapy (93, 94). It has a dose-dependent effect on increased risk of HF (93, 94). The previous or current use of glucocorticoids is associated with increased risk of any fracture at all ages compared with those with no history of glucocorticoids use and the highest level of risk among all FFs is observed for HF (65, 95, 96).

Several clinical risk factors including comorbidities were identified as risk factors for FHF in this analysis. This study confirmed that a history of fragility or osteoporotic fracture, a family or maternal history of FF, PVD, CVD, peptic ulcer disease, liver disease, neoplasm, hypertension, bronchial asthma, vision impairment and hearing impairment were risk factors increased an individual patient's risk of FHF. The finding of the current study also agrees with previous studies (36, 42, 45, 97, 98).

In contrast to other investigators (35, 36, 42, 98, 99), this study failed to find an association between common comorbidities such as ischemic heart disease, dementia, chronic obstructive pulmonary disease, rheumatic diseases, diabetes mellitus and renal diseases and the risk of HF.

The primary determinants of mortality following HF are comorbidities present at the time of fracture (97) and the findings of this study related to in-hospital and 1 year mortality are comparable with the large body of evidence emerging from previous studies (46-61). For in-hospital mortality, the rate of 2.8% is very much comparable with ranged from 4% to 12% (46-52); for 1 year mortality, the study value of 15.6%, is also consistent with previous results that have ranged from 12% to 37% (46, 48-58). The finding that the type and number of comorbidities at the baseline is associated with post-fracture mortality, both in-hospital and at 1 year are consistent with the findings of previous studies.

Limitations

There are several limitations in the present study. This study was limited to a single geographical area of Sri Lanka and the relatively small sample size did not have adequate power to reveal weaker associations. Further information on several other factors associated with HF, including BMD, BMI, hormone replacement therapy, vitamin D deficiency, intake of milk and calcium and environmental risk factors were not assessed.

Conclusions

It can be concluded that history of fragility or osteoporotic fracture and family or maternal history of FF increase the risk of HF in older people living in the community. Also, the comorbidities such as PVD, CVD, peptic ulcer disease, liver diseases, neoplasm, hypertension, bronchial asthma, vision impairment and hearing impairment are significantly associated with FHF patients. Also it was found that the type and number of baseline comorbidities are determinants of mortality in the HF patients, both in-hospital and at 1 year.

Recommendations

It can be recommended that more studies of similar nature in large sample to identify independent predictors of HF risk that contribute to a substantial proportion of HF among elderly people.

Acknowledgements

Faculty Research Grant - 2017, Faculty of Medicine, University of Ruhuna, Matara, Sri Lanka.
University Grants Commission, Colombo, Sri Lanka. (UGC/VC/DRIC/PG2017(1)/RUH/01).

References

1. Cummings, S. R. *et al.* (1985) 'Epidemiology of osteoporosis and osteoporotic fractures.', *Epidemiologic reviews*. United States, 7, pp. 178–208. doi: 10.1093/oxfordjournals.epirev.a036281.
2. Versluisen, M. (1986) 'How elderly patients with femoral fracture develop pressure sores in hospital', *British Medical Journal* (Clinical research ed.), 292(6531), pp. 1311–1313. doi: 10.1136/bmj.292.6531.1311.
3. McLaughlin, M. A. *et al.* (2006) 'Preoperative status and risk of complications in patients with hip fracture', *Journal of General Internal Medicine*, 21(3), pp. 219–225. doi: 10.1111/j.1525-1497.2006.00318.x.
4. Tay, E. (2016) 'Hip fractures in the elderly: Operative versus nonoperative management', *Singapore Medical Journal*, 57(4). doi: 10.11622/smedj.2016071.
5. Pisani, P. *et al.* (2016) 'Major osteoporotic fragility fractures : Risk factor updates and societal impact', 7(3), pp. 171–181. doi: 10.5312/wjo.v7.i3.171.
6. Melton, L. J. 3rd and Cummings, S. R. (1987) 'Heterogeneity of age-related fractures: implications for epidemiology.', *Bone and mineral*. Ireland, 2(4), pp. 321–331.
7. Cooper, C. and Melton, L. J. (1992) 'Epidemiology of osteoporosis', *Trends in Endocrinology & Metabolism*, 3(6), pp. 224–229. doi: https://doi.org/10.1016/1043-2760(92)90032-V.
8. Melton, L. J. (1991) '1 Epidemiology of osteoporosis', *Baillière's Clinical Obstetrics and Gynaecology*, 5(4), pp. 785–805. doi: https://doi.org/10.1016/S0950-3552(05)80287-1.
9. Melton, L. J. *et al.* (1992) 'Perspective how many women have osteoporosis?', *Journal of Bone and Mineral Research*, 7(9), pp. 1005–1010. doi: 10.1002/jbmr.5650070902.
10. Warriner, A. H. *et al.* (2011) 'Which fractures are most attributable to osteoporosis?', *Journal of Clinical Epidemiology*, 64(1), pp. 46–53. doi: https://doi.org/10.1016/j.jclinepi.2010.07.007.
11. Sabharwal, S. and Wilson, H. (2015) 'Orthogeriatrics in the management of frail older patients with a fragility fracture.', *Osteoporosis international : a journal established as result of cooperation between the European Foundation for Osteoporosis and the National Osteoporosis Foundation of the USA*. England, 26(10), pp. 2387–2399. doi: 10.1007/s00198-015-3166-2.
12. Nydegger, V. *et al.* (1991) 'Epidemiology of fractures of the proximal femur in Geneva: Incidence, clinical and social aspects', *Osteoporosis International*, 2(1), pp. 42–47. doi: 10.1007/BF01627078.
13. Cooper, C., Campion, G. and Melton 3rd, L. J. (1992) 'Hip fractures in the elderly: a world-wide projection', *Osteoporosis international : a journal established as result of cooperation between the European Foundation for Osteoporosis and the National Osteoporosis Foundation of the USA*. England, 2(6), pp. 285–289. doi: 10.1007/bf01623184.
14. Cummings, S. R. and Melton, L. J. (2002) 'Epidemiology and outcomes of osteoporotic fractures.', *Lancet (London, England)*. England, 359(9319), pp. 1761–1767. doi: 10.1016/S0140-6736(02)08657-9.
15. Gullberg, B., Johnell, O. and Kanis, J. A. (1997) 'World-wide Projections for Hip Fracture', *Osteoporosis International*, 7(5), pp. 407–413. doi: 10.1007/PL00004148.
16. Kanis, J. A. *et al.* (2002) 'A new approach to the development of assessment guidelines for osteoporosis.', *Osteoporosis international : a journal established as result of cooperation between the European Foundation for Osteoporosis and the National Osteoporosis Foundation of the USA*. England, 13(7), pp. 527–536. doi: 10.1007/s001980200069.
17. Johnell, O. *et al.* (1992) 'The apparent incidence of hip fracture in Europe: a study of national register sources', *Osteoporosis international : a journal established as result of cooperation between the European Foundation for Osteoporosis and the National Osteoporosis Foundation of the USA*. England, 2(6), pp. 298–302. doi: 10.1007/bf01623186.
18. Ross, P. D. *et al.* (1990) 'A critical review of bone mass and the risk of fractures in osteoporosis', *Calcified Tissue International*, 46(3), pp. 149–161. doi: 10.1007/BF02555036.
19. Nevitt, M. C. *et al.* (1994) 'Bone mineral density predicts non-spine fractures in very elderly women. Study of Osteoporotic Fractures Research Group.', *Osteoporosis international : a journal established as result of cooperation between the European Foundation for Osteoporosis and the National Osteoporosis Foundation of the USA*. England, 4(6), pp. 325–331. doi: 10.1007/BF01622192.
20. Kanis, J. A. (1994) 'Assessment of fracture risk and its application to screening for postmenopausal osteoporosis: synopsis of a WHO report. WHO Study Group.', *Osteoporosis international : a journal established as result of cooperation between the European Foundation for Osteoporosis and the National Osteoporosis Foundation of the USA*. England, 4(6), pp. 368–381. doi: 10.1007/BF01622200.
21. Cosman, F. *et al.* (2014) 'Clinician's Guide to Prevention and Treatment of Osteoporosis.', *Osteoporosis international : a journal established as result of cooperation between the European Foundation for Osteoporosis and the National Osteoporosis Foundation of the USA*, 25(10), pp. 2359–2381. doi: 10.1007/s00198-014-2794-2.
22. Kado, D. M. *et al.* (2007) 'Hyperkyphotic Posture and Risk of Injurious Falls in Older Persons: The Rancho Bernardo

- Study', *The Journals of Gerontology: Series A*, 62(6), pp. 652–657. doi: 10.1093/gerona/62.6.652.
23. Favier, F. *et al.* (1996) 'Fall-related factors and risk of hip fracture: the EPIDOS prospective study', 348, pp. 145–149.
 24. Gregg, E. W. *et al.* (1998) 'Physical activity and osteoporotic fracture risk in older women', *Annals of internal medicine*. American College of Physicians, 129(2), pp. 81–88.
 25. Grisso, J. A., Chiu, G. Y., *et al.* (1991) 'Risk factors for hip fractures in men: a preliminary study.', *Journal of bone and mineral research: the official journal of the American Society for Bone and Mineral Research*. United States, 6(8), pp. 865–868. doi: 10.1002/jbmr.5650060812.
 26. Hedlund, R. and Lindgren, U. (1987) 'Trauma type, age, and gender as determinants of hip fracture', *Journal of Orthopaedic Research*. John Wiley & Sons, Ltd, 5(2), pp. 242–246. doi: 10.1002/jor.1100050210.
 27. Melton, L. J. (1993) 'Hip fractures: A worldwide problem today and tomorrow', *Bone*. Elsevier, 14, pp. 1–8. doi: 10.1016/8756-3282(93)90341-7.
 28. Nguyen, N. D. *et al.* (2005) 'Identification of high-risk individuals for hip fracture: a 14-year prospective study.', *Journal of bone and mineral research: the official journal of the American Society for Bone and Mineral Research*. United States, 20(11), pp. 1921–1928. doi: 10.1359/JBMR.050520.
 29. Cummings, S. R. and Nevitt, M. C. (1989) 'A hypothesis: the causes of hip fractures.', *Journal of gerontology*. United States, 44(4), pp. M107–11. doi: 10.1093/geronj/44.4.m107.
 30. Brocklehurst, J. C. *et al.* (1978) 'Fracture of the femur in old age: A two-centre study of associated clinical factors and the cause of the fall.', *Age and ageing*. England, 7(1), pp. 2–15. doi: 10.1093/ageing/7.1.7.
 31. Ray, W. A. *et al.* (1987) 'Psychotropic drug use and the risk of hip fracture.', *The New England journal of medicine*. United States, 316(7), pp. 363–369. doi: 10.1056/NEJM198702123160702.
 32. Grisso, J. A., Kelsey, J. L., *et al.* (1991) 'Risk factors for falls as a cause of hip fracture in women. The Northeast Hip Fracture Study Group.', *The New England journal of medicine*. United States, 324(19), pp. 1326–1331. doi: 10.1056/NEJM199105093241905.
 33. Felson, D. T. *et al.* (1989) 'Impaired vision and hip fracture. The Framingham Study.', *Journal of the American Geriatrics Society*. United States, 37(6), pp. 495–500. doi: 10.1111/j.1532-5415.1989.tb05678.x.
 34. Porter, R. W. *et al.* (1990) 'Prediction of hip fracture in elderly women: A prospective study', *British Medical Journal*, 301(6753), pp. 638–641. doi: 10.1136/bmj.301.6753.638.
 35. Fujiwara, S. *et al.* (1997) 'Risk factors for hip fracture in a Japanese cohort.', *Journal of bone and mineral research: the official journal of the American Society for Bone and Mineral Research*. United States, 12(7), pp. 998–1004. doi: 10.1359/jbmr.1997.12.7.998.
 36. Cummings, S. R. *et al.* (1995) 'Risk factors for hip fracture in white women. Study of Osteoporotic Fractures Research Group.', *The New England journal of medicine*. United States, 332(12), pp. 767–773. doi: 10.1056/NEJM199503233321202.
 37. Lau, E. *et al.* (1988) 'Physical activity and calcium intake in fracture of the proximal femur in Hong Kong', *BMJ (Clinical research ed.)*, 297(6661), pp. 1441–1443. doi: 10.1136/bmj.297.6661.1441.
 38. Lau, E. M. *et al.* (2001) 'The incidence of hip fracture in four Asian countries: the Asian Osteoporosis Study (AOS).', *Osteoporosis international: a journal established as result of cooperation between the European Foundation for Osteoporosis and the National Osteoporosis Foundation of the USA*. England, 12(3), pp. 239–243. doi: 10.1007/s001980170135.
 39. Kiel, D. P. *et al.* (1990) 'Caffeine and the risk of hip fracture: the Framingham Study.', *American journal of epidemiology*. United States, 132(4), pp. 675–684. doi: 10.1093/oxfordjournals.aje.a115709.
 40. Meyer, H. E., Tverdal, A. and Falch, J. A. (1993) 'Risk factors for hip fracture in middle-aged Norwegian women and men.', *American journal of epidemiology*. United States, 137(11), pp. 1203–1211. doi: 10.1093/oxfordjournals.aje.a116622.
 41. US Department of Health and Human Services (2004) 'Bone health and osteoporosis: a report of the Surgeon General', *US Health and Human Services*, p. 437. doi: 10.2165/00002018-200932030-00004.
 42. Kanis, J. A. (2007) 'Assessment of osteoporosis at the primary health care level', *World Health*, p. 339. Available at: http://www.shef.ac.uk/FRAX/pdfs/WHO_Technical_Report.pdf.
 43. Bonner, F. *et al.* (2003) 'Health Professional's Guide to Rehabilitation of the Patient with Osteoporosis', *Osteoporosis international: a journal established as result of cooperation between the European Foundation for Osteoporosis and the National Osteoporosis Foundation of the USA*, 14 Suppl 2, pp. S1–22. doi: 10.1007/s00198-002-1308-9.
 44. Ettinger, M. P. (2003) 'Aging bone and osteoporosis: strategies for preventing fractures in the elderly.', *Archives of internal medicine*. United States, 163(18), pp. 2237–2246. doi: 10.1001/archinte.163.18.2237.
 45. 'Guideline for the prevention of falls in older persons. American Geriatrics Society, British Geriatrics Society, and American Academy of Orthopaedic Surgeons Panel on Falls Prevention.' (2001) *Journal of the American Geriatrics Society*. United States, 49(5), pp. 664–672.
 46. Kenzora, J. E. *et al.* (1984) 'Hip fracture mortality. Relation to age, treatment, preoperative illness, time of surgery, and complications.', *Clinical orthopaedics and related research*. United States, (186), pp. 45–56.
 47. Hannan, E. L. *et al.* (2001) 'Mortality and locomotion 6 months after hospitalization for hip fracture: risk factors and risk-adjusted hospital outcomes.', *JAMA*. United States, 285(21), pp. 2736–2742. doi: 10.1001/jama.285.21.2736.
 48. Myers, A. H. *et al.* (1991) 'Hip fractures among the elderly: factors associated with in-hospital mortality.', *American journal of epidemiology*. United States, 134(10), pp. 1128–1137. doi: 10.1093/oxfordjournals.aje.a116016.

49. White, B. L., Fisher, W. D. and Laurin, C. A. (1987) 'Rate of mortality for elderly patients after fracture of the hip in the 1980's.', *The Journal of bone and joint surgery. American volume*. United States, 69(9), pp. 1335–1340.
50. Walker, N. *et al.* (1999) 'Mortality after hip fracture: regional variations in New Zealand', *The New Zealand medical journal*, 112(1092), p. 269–271. Available at: <http://europepmc.org/abstract/MED/10472890>.
51. Lu-Yao, G. L. *et al.* (1994) 'Treatment and survival among elderly Americans with hip fractures: a population-based study', *American journal of public health*, 84(8), pp. 1287–1291. doi: 10.2105/ajph.84.8.1287.
52. Zuckerman, J. D. *et al.* (1995) 'Postoperative complications and mortality associated with operative delay in older patients who have a fracture of the hip.', *The Journal of bone and joint surgery. American volume*. United States, 77(10), pp. 1551–1556. doi: 10.2106/00004623-199510000-00010.
53. Schröder, H. M. and Erlandsen, M. (1993) 'Age and sex as determinants of mortality after hip fracture: 3,895 patients followed for 2.5-18.5 years', *Journal of orthopaedic trauma*, 7(6), p. 525–531. doi: 10.1097/00005131-199312000-00007.
54. Aharonoff, G. B. *et al.* (1997) 'Hip fractures in the elderly: predictors of one year mortality.', *Journal of orthopaedic trauma*. United States, 11(3), pp. 162–165. doi: 10.1097/00005131-199704000-00004.
55. Fisher, E. S. *et al.* (1991) 'Hip fracture incidence and mortality in New England.', *Epidemiology (Cambridge, Mass.)*. United States, 2(2), pp. 116–122. doi: 10.1097/00001648-199103000-00005.
56. Elliott, J. *et al.* (2003) 'Predicting survival after treatment for fracture of the proximal femur and the effect of delays to surgery.', *Journal of clinical epidemiology*. United States, 56(8), pp. 788–795. doi: 10.1016/s0895-4356(03)00129-x.
57. Wehren, L. E. *et al.* (2003) 'Gender differences in mortality after hip fracture: the role of infection.', *Journal of bone and mineral research : the official journal of the American Society for Bone and Mineral Research*. United States, 18(12), pp. 2231–2237. doi: 10.1359/jbmr.2003.18.12.2231.
58. Forsén, L. *et al.* (1999) 'Survival after hip fracture: short- and long-term excess mortality according to age and gender.', *Osteoporosis international : a journal established as result of cooperation between the European Foundation for Osteoporosis and the National Osteoporosis Foundation of the USA*. England, 10(1), pp. 73–78. doi: 10.1007/s001980050197.
59. Zuckerman, J. D. (1996) 'Hip Fracture', *New England Journal of Medicine*. Massachusetts Medical Society, 334(23), pp. 1519–1525. doi: 10.1056/NEJM199606063342307.
60. Lyons, A. R. (1997) 'Clinical outcomes and treatment of hip fractures.', *The American journal of medicine*. United States, 103(2A), pp. 51S-63S; discussion 63S-64S. doi: 10.1016/s0002-9343(97)90027-9.
61. Orosz, G. M. *et al.* (2004) 'Association of timing of surgery for hip fracture and patient outcomes.', *JAMA*, 291(14), pp. 1738–1743. doi: 10.1001/jama.291.14.1738.
62. Kanis, J. A. *et al.* (2013) 'European guidance for the diagnosis and management of osteoporosis in postmenopausal women', *Osteoporosis International*, 24(1), pp. 23–57. doi: 10.1007/s00198-012-2074-y.
63. Johnell, O. *et al.* (2005) 'The burden of hospitalised fractures in Sweden', *Osteoporosis International*, 16(2), pp. 222–228. doi: 10.1007/s00198-004-1686-2.
64. Klotzbuecher, C. M. *et al.* (1986) 'Patients with Prior Fractures Have an Increased Risk of Future Fractures: A Summary of the Literature and Statistical Synthesis', *Journal of Bone and Mineral Research*, 15(4), pp. 721–739. doi: 10.1359/jbmr.2000.15.4.721.
65. Kanis, J. A., Johnell, O., *et al.* (2004) 'A meta-analysis of previous fracture and subsequent fracture risk.', *Bone*. United States, 35(2), pp. 375–382. doi: 10.1016/j.bone.2004.03.024.
66. Wilson, R. T. *et al.* (2006) 'Hip fracture risk among community-dwelling elderly people in the United States: a prospective study of physical, cognitive, and socioeconomic indicators', *American journal of public health*. 2006/05/30. © American Journal of Public Health 2006, 96(7), pp. 1210–1218. doi: 10.2105/AJPH.2005.077479.
67. Haentjens, P., Autier, P. and Boonen, S. (2002) 'Clinical risk factors for hip fracture in elderly women: a case-control study.', *Journal of orthopaedic trauma*. United States, 16(6), pp. 379–385. doi: 10.1097/00005131-200207000-00003.
68. Gunnes, M., Mellström, D. and Johnell, O. (1998) 'How well can a previous fracture indicate a new fracture? A questionnaire study of 29,802 postmenopausal women.', *Acta orthopaedica Scandinavica*. England, 69(5), pp. 508–512. doi: 10.3109/17453679808997788.
69. Gärdsell, P. *et al.* (1989) 'The predictive value of fracture, disease, and falling tendency for fragility fractures in women', *Calcified Tissue International*, 45(6), pp. 327–330. doi: 10.1007/BF02556001.
70. Melton, L. J. *et al.* (1992) 'Perspective how many women have osteoporosis?', *Journal of Bone and Mineral Research*, 7(9), pp. 1005–1010. doi: 10.1002/jbmr.5650070902.
71. Slemenda, C. W. *et al.* (1991) 'Genetic determinants of bone mass in adult women: a reevaluation of the twin model and the potential importance of gene interaction on heritability estimates.', *Journal of bone and mineral research : the official journal of the American Society for Bone and Mineral Research*. United States, 6(6), pp. 561–567. doi: 10.1002/jbmr.5650060606.
72. Kanis, J. A. *et al.* (2005) 'Smoking and fracture risk: a meta-analysis.', *Osteoporosis international : a journal established as result of cooperation between the European Foundation for Osteoporosis and the National Osteoporosis Foundation of the USA*. England, 16(2), pp. 155–162. doi: 10.1007/s00198-004-1640-3.
73. Law, M. R. and Hackshaw, A. K. (1997) 'A meta-analysis of cigarette smoking, bone mineral density and risk of hip fracture: recognition of a major effect.', *BMJ (Clinical research ed.)*, 315(7112), pp. 841–846. doi: 10.1136/bmj.315.7112.841.

74. Cumming, R. G. and Klineberg, R. J. (1994) 'Case-control study of risk factors for hip fractures in the elderly.', *American journal of epidemiology*. United States, 139(5), pp. 493–503. doi: 10.1093/oxfordjournals.aje.a117032.
75. Vestergaard, P. and Mosekilde, L. (2003) 'Fracture risk associated with smoking: a meta-analysis.', *Journal of internal medicine*. England, 254(6), pp. 572–583. doi: 10.1111/j.1365-2796.2003.01232.x.
76. Ampelas, D. G. (2018) 'Current and former smokers and hip fractures.', *Journal of frailty, sarcopenia and falls*, 3(3), pp. 148–154. doi: 10.22540/JFSF-03-148.
77. May, H., Murphy, S. and Khaw, K. T. (1994) 'Cigarette smoking and bone mineral density in older men.', *QJM: monthly journal of the Association of Physicians*. England, 87(10), pp. 625–630.
78. Høidrup, S. *et al.* (2000) 'Tobacco smoking and risk of hip fracture in men and women.', *International journal of epidemiology*. England, 29(2), pp. 253–259. doi: 10.1093/ije/29.2.253.
79. Ward, K. D. and Klesges, R. C. (2001) 'A meta-analysis of the effects of cigarette smoking on bone mineral density.', *Calcified tissue international*, 68(5), pp. 259–270. doi: 10.1007/BF02390832.
80. Wu, Z.-J. *et al.* (2016) 'Effect of Cigarette Smoking on Risk of Hip Fracture in Men: A Meta-Analysis of 14 Prospective Cohort Studies.', *PloS one*, 11(12), p. e0168990. doi: 10.1371/journal.pone.0168990.
81. Hemenway, D. *et al.* (1994) 'Risk factors for hip fracture in US men aged 40 through 75 years.', *American Journal of Public Health*. American Public Health Association, 84(11), pp. 1843–1845. doi: 10.2105/AJPH.84.11.1843.
82. Grisso, J. A. *et al.* (1994) 'Risk Factors for Hip Fracture in Black Women', *New England Journal of Medicine*. Massachusetts Medical Society, 330(22), pp. 1555–1559. doi: 10.1056/NEJM199406023302202.
83. Johnell, O. *et al.* (1995) 'Risk factors for hip fracture in european women: The MEDOS study', *Journal of Bone and Mineral Research*. John Wiley & Sons, Ltd, 10(11), pp. 1802–1815. doi: 10.1002/jbmr.5650101125.
84. Clark, P. *et al.* (1998) 'Risk factors for osteoporotic hip fractures in Mexicans.', *Archives of medical research*. United States, 29(3), pp. 253–257.
85. Felson, D. T. *et al.* (1988) 'Alcohol consumption and hip fractures: the Framingham Study.', *American journal of epidemiology*. United States, 128(5), pp. 1102–1110. doi: 10.1093/oxfordjournals.aje.a115052.
86. Hemenway, D. *et al.* (1988) 'Fractures and lifestyle: effect of cigarette smoking, alcohol intake, and relative weight on the risk of hip and forearm fractures in middle-aged women.', *American journal of public health*, 78(12), pp. 1554–1558. doi: 10.2105/ajph.78.12.1554.
87. Nelson, H. D. *et al.* (1994) 'Smoking, alcohol, and neuromuscular and physical function of older women. Study of Osteoporotic Fractures Research Group.', *JAMA*. United States, 272(23), pp. 1825–1831. doi: 10.1001/jama.1994.03520230035035.
88. Johnell, O., Kristenson, H. and Redlund-Johnell, I. (1985) 'Lower limb fractures and registration for alcoholism.', *Scandinavian journal of social medicine*. Sweden, 13(3), pp. 95–97. doi: 10.1177/140349488501300304.
89. Hernandez-Avila, M. *et al.* (1991) 'Caffeine, moderate alcohol intake, and risk of fractures of the hip and forearm in middle-aged women.', *The American journal of clinical nutrition*. United States, 54(1), pp. 157–163. doi: 10.1093/ajcn/54.1.157.
90. Holbrook, T. L. and Barrett-Connor, E. (1993) 'A prospective study of alcohol consumption and bone mineral density', *BMJ (Clinical research ed.)*, 306(6891), pp. 1506–1509. doi: 10.1136/bmj.306.6891.1506.
91. Felson, D. T. *et al.* (1995) 'Alcohol intake and bone mineral density in elderly men and women. The Framingham Study.', *American journal of epidemiology*. United States, 142(5), pp. 485–492. doi: 10.1093/oxfordjournals.aje.a117664.
92. Fujiwara, S. (2010) '[Epidemiological view of fracture risk].', *Clinical calcium*. Japan, 20(9), pp. 1321–1326.
93. Van Staa, T. P., Leufkens, H. G. M. and Cooper, C. (2002) 'The epidemiology of corticosteroid-induced osteoporosis: a meta-analysis.', *Osteoporosis international: a journal established as result of cooperation between the European Foundation for Osteoporosis and the National Osteoporosis Foundation of the USA*. England, 13(10), pp. 777–787. doi: 10.1007/s001980200108.
94. Van Staa, T. P. *et al.* (2000) 'Use of oral corticosteroids and risk of fractures.', *Journal of bone and mineral research: the official journal of the American Society for Bone and Mineral Research*. United States, 15(6), pp. 993–1000. doi: 10.1359/jbmr.2000.15.6.993.
95. Cooper, C., Coupland, C. and Mitchell, M. (1995) 'Rheumatoid arthritis, corticosteroid therapy and hip fracture.', *Annals of the rheumatic diseases*, 54(1), pp. 49–52. doi: 10.1136/ard.54.1.49.
96. Hooyman, J. R. *et al.* (1984) 'Fractures after rheumatoid arthritis a population-based study', *Arthritis & Rheumatism*. John Wiley & Sons, Ltd, 27(12), pp. 1353–1361. doi: 10.1002/art.1780271205.
97. Jiang, H. X. *et al.* (2005) 'Development and initial validation of a risk score for predicting in-hospital and 1-year mortality in patients with hip fractures', *Journal of Bone and Mineral Research*, 20(3), pp. 494–500. doi: 10.1359/JBMR.041133.
98. Lichtenstein, M. J. *et al.* (1994) 'Risk factors for hip fractures occurring in the hospital', *American Journal of Epidemiology*, 140(9), pp. 830–838. doi: 10.1093/oxfordjournals.aje.a117331.
99. Brauer, C. A. *et al.* (2009) 'Incidence and mortality of hip fractures in the United States', *JAMA*, 302(14), pp. 1573–1579. doi: 10.1001/jama.2009.1462.

FP 02

The Impact of Gender and Age on Health and Quality of Life of Older People in Galle District, Sri Lanka

De Silva K.^{1#}, Liyanage C.², Wijesinghe C.², Perera B.²

¹*Department of Nursing, Faculty of Allied Health Sciences, University of Ruhuna, Sri Lanka*

²*Department of Community Medicine, Faculty of Medicine, University of Ruhuna, Sri Lanka*

Corresponding author: manojadsilva@gmail.com

Abstract

Background: Sri Lanka's population is rapidly aging. Quality of Life (QOL) of older people in many countries is in jeopardy at present and Sri Lanka is no exception. QOL among the older people is often associated with physical deterioration along with their health conditions.

Objectives: This paper describes QOL and health status of older people in Galle and the impact of gender and age on QOL of them.

Methods: A cross sectional study was done using a random sample of older people aged 60 years and above living in Galle district. A pre-tested interviewer administered questionnaire was used to collect data. Activities of Daily Living (ADL) scale, World Health Organization Quality Of Life-BREF (WHOQOL-BREF) scale, Mini Mental Status Examination (MMSE) scale and Center for Epidemiologic Studies depression scale (CES-D Scale) were used to collect data. These scales were validated and used in community surveys in Sri Lanka. Health status was measured by assessing health conditions using available health records. Descriptive statistics and t-test were used in the analysis. Ethical approval was obtained from the Ethics Review Committee, Faculty of Medicine, University of Ruhuna, Galle, Sri Lanka.

Results: A total of 396 older people participated in the study. Mean age of the participants was 69 (± 7.2) years, and the majority were females ($n = 268$, 67.7%). Hypertension, cardiovascular diseases, diabetes, joint related diseases and vision problems were common in this target population. Older women were more likely than older men to suffer from joint related disease and older men were more likely than older women to suffer from cardiovascular diseases and hearing deficiencies. There was no gender difference of the mean ADL values, but those of aged 70 or more years reported slightly lower mean ADL value than those of 60-69 years (98.46 vs 99.60, $p < 0.01$). No gender or age differences of the mean CES-D values and mean MMSE scores were found. The mean value of QOL of younger older people were slightly higher than that of others (308.4 vs 296.6, $p < 0.01$), but no gender difference was found.

Conclusion: Cardiovascular diseases, diabetes, arthritis and vision problems are prevalent in older people in Galle. Health authorities should pay attention to reduce incidence rates of these diseases and particular attention should be paid to provide healthcare facilities to older women with joint diseases. Interventions that support active lifestyle in older people in advanced ages would probably facilitate them to enhance their QOL.

Keywords: Health status, older people, Quality of Life, gender & age, Sri Lanka.

Background

Many populations across the world are aging fast. Old age is a normal part of the life of people, although many older people are at high risk of developing various ill-health conditions due to continuous deterioration of physical and psychological health conditions in them (1). Increasing longevity is one of the humanity's greatest achievements. The human life span follows a recognized pattern from birth to death. A peak of human growth and development is reached in the twenties. Then there is a gradual deterioration in physical and mental abilities (2). The number of older people (aged 60 years or over) is increasing rapidly worldwide (3). Globally, the number of older people is expected to more than double, from 841 million people in 2013 to 2 billion in 2050. About two thirds of the world's older people live in developing countries. The older people population in less developed regions is growing faster than the more developed regions.

By 2050, nearly 8 in 10 of the world's older people population will live in the less developed regions (3). As noted by the WHO, females encompass the majority of the older people population around the world as they tend to outlive males (4).

Sri Lanka, a country which has shown an increasing life expectancy at birth and declining mortality rates in the past few decades, is likely to experience a significant increase in its older people population in the near future. In 2012, the proportion of the population aged 60 years and older in Sri Lanka was approximately 12.2% (5). It is estimated by the year 2021 this proportion will increase up to 16.7% and by 2041, 1 out of every 4 individuals will be an older person, making Sri Lanka's population the oldest in the South Asia region.

Health status is the impact of disease on patient function as reported by the patient. More specifically, health status can be defined as the range of manifestation of disease in a given patient including symptoms, functional limitation, and quality of life, in which quality of life is the discrepancy between actual and desired function (6). Health status of older persons are determined by the level of dependence of the older persons in activities of daily living, the prevalence of physical and mental impairments, and the prevalence of illnesses and disabilities which are crucial to ensure the well-being of them (7).

Health problems of older people are supposed to be one of the major public health concerns of any country as older people are more prone to suffer from ill health than people in younger age groups, thus require more healthcare facilities. Gender, age, race, place of living and economic status were found to be vital determinants of health and well-being of older people, and in general they receive both informal and formal care available in their living settings (8). However, the healthcare received by older people in different population groups vary remarkably making it a considerable factor associated with their quality of life. It is often claimed that ageing is accompanied by multiple illnesses and physical ailments. Besides physical illnesses, the aged are more likely to be victims of poor mental health, which arises from senility, neurosis and extent of life satisfaction (9). A study conducted in India has shown that, almost all diseases were commonly seen in older people except gynecological diseases (9). Among these hypertension, ear diseases, skin diseases, musculoskeletal disorders, psychological disorders, cancer and neurological diseases were found to be significantly more common in rural older people than urban older people (9). A study done in US has shown that the most frequently occurring chronic conditions in the older people population are hypertension, arthritis, heart disease, cancer, diabetes, and sinusitis (10). Community-resident seniors with chronic disabilities receive either informal care (from family or friends) or formal care (from service-provider agencies). In India, more than 90% of older people with chronic disabilities receive informal and/or formal care, and about two-thirds receive informal care only (9). A survey conducted in Sri Lanka has shown that health status and health care services available for older people is an emerging public health issue and it has been recognized by the government as a devastating health and economic issue at present. Almost 93% of the older

population seeks health care from the existing primary health care network in the country (11) and the rapid increase in the elderly population requires expansion of the existing health facilities for geriatric population in Sri Lanka. A national survey done in Sri Lanka revealed that 55% of elderly population put pressure on health systems with the rise of chronic illness such as Diabetes, Hypertension, cardiovascular diseases, osteoarthritis, stroke, cancer, and Asthma (11). Further, defects of vision, hearing physical and mental performance are reported in various proportions of elders and have resulted in varying degrees of morbidity (11).

Quality of Life is a broad concept and it is affected in a complex way by the person's physical health, psychological state, level of independence, social relationships, personal beliefs and their relationship to salient features of their environment (12). Researchers are exploring the connections between health and well-being in order to improve the overall quality of life of older people. It is well recognized that with advancing age, there is a high incidence of age-related chronic diseases that diminish their well-being status. Evidence suggests that older people get dissatisfied, lonelier and depressed due to demographic changes (13). In Tanzania, a developing country, a study revealed that poor quality of life. Well-being and health status in older people are significantly related to marital status, gender and the age (14). In Sri Lanka, a study revealed that, poorer QOL was seen in participants with the presence of three or more health problems, being admitted to hospital, and accidents and falls (15). Only a handful of studies have investigated how personal factors shape the health and QOL of older people in Sri Lanka. Therefore there is a need to understand how gender and age, two vital personal factors, influence health and QOL of older people in different parts in Sri Lanka.

Objectives

To examine how gender and age impact health status and QOL of older people in Galle, Sri Lanka.

Methods

A community-based descriptive, cross-sectional study was done using a random sample of older people aged 60 years and above living in Galle district, Sri Lanka. The study sample was 396 older people living in Galle. Older people were grouped into two groups as range of 60-69 and 70-100 yrs. Sampling was carried out according to the following procedure. Out of 19 Assistant Government Agents (AGA) divisions in Galle District, one urban and two rural AGA divisions were selected for the study. Selected AGA divisions were Hikkaduwa, Elpitiya and Karadeniya. Two Grama Niladhari Divisions (GND) were selected randomly from each AGA division for the data collection. A pre-tested interviewer administered questionnaire was used to collect data. The elderly people who are from elderly home or institutionalized and who are living temporarily in the area were excluded from this study while those suffering from severe health conditions and who were not capable of providing informed consent were also excluded. The reasons for exclusion of older people with severe health conditions is that they are difficult to face for interviewer administered questionnaire for a long period and unable to provide written consent for the study. Questionnaire included several scales. Barthel index for Activities of Daily Living (ADL) which has 10 items was used to assess dependency status. It measures a person's daily functioning specially the activities of daily living (feeding, bathing, grooming, dressing, bowels, bladder, toilet usage, transfers (bed to chair and back), mobility (on level surfaces) and climbing stairs. The score of this scale is ranging from 0-100 and a score closer to 100 indicate very low dependency. World Health Organization Quality Of Life-BREF (WHOQOL-BREF) which has 26 items was also used. It scored in four domains: Physical (Seven items), Psychological (Six items), Social relations (Three items) and Environment (Eight items). The items of the WHOQOL-BREF questionnaire inquire that how much, how

completely, how often, how good or how satisfied the respondent felt in the last two weeks. The total score of this scale is ranging from 0–400 where higher scores indicate higher QOL. Mental health was assessed using Min Mental Status Examination (MMSE) and Centre for Epidemiologic studies depression scale (CES-D Scale). The MMSE has 11 items and this scale is designed to measure that five areas of cognitive function: orientation, registration, attention and calculation, recall and language. The maximum MMSE score is 30 points. A score of 20 to 24 suggests mild dementia, 13 to 20 suggests moderate dementia, and less than 12 indicates severe dementia. The CES-D Scale has 20 items and the score ranges from 0 to 60 where a score above 16 indicates an elevated level of depressive symptoms. This scale comprises six scales reflecting major facets of depression: depressed mood, feelings of guilt and worthlessness, feelings of helplessness and hopelessness, psychomotor retardation, loss of appetite, and sleep disturbance.

All these scales were validated and used in Sri Lanka (16-19). Health conditions were assessed by reviewing the participant's diagnosis cards and clinical records. Measurement of blood pressure and vision were also undertaken to assess their health status. Ethical approval was obtained from the Ethics Review Committee, Faculty of Medicine, University of Ruhuna, Galle. The participants were educated about the research and their written informed consent was obtained before enrolling into the study.

Data were analyzed using SPSS software version 20.0. Survey data were entered and scores were computed according to the given scoring system. Descriptive statistics, such as means, standard deviation, frequencies and percentages were determined. The t-test was also used in the analysis.

Results

A total of 396 older people participated in the study. Mean age of the participants was 69 years (± 7.2) and the majority were females ($n = 268$, 67.7%). Socio Demographic description of the study participants are shown in Table 1.

Table 1: Demographic description of the study participants by gender (n=396)

Demographic data	Categories	Male (n=128)	Female (n=268)	Total (n=396)
Age	60-69	68 (53.1%)	156 (58.2%)	224 (56.6%)
	70-100	60 (46.9%)	112 (41.8%)	172 (43.4%)
Civil status	Married	111 (28%)	139 (35.1%)	250 (63.1%)
	Unmarried	2 (0.5%)	17 (4.3%)	19 (4.8%)
	Separated	2(0.5%)	3(0.8%)	5 (1.3%)
	Widowed	13 (3.3%)	109 27.5%)	122 (30.8%)
Educational level	No education	3 (2.3%)	23 (8.6%)	26 (6.6%)
	Primary education	41 (32%)	73 (27.2%)	114(28.8%)
	Secondary education	82 (64.1%)	169 (63.1%)	251 (63.4%)
	Degree level	2 (1.6%)	3 (1.1%)	5 (1.3%)
Employment status	Semi-professionals	1 (0.8%)	1(0.4%)	2(0.5%)
	Unskilled	45 (35.1%)	25 (9.3%)	70 (17.7%)
	Self-employment/ house work	82 (64.1%)	242 (90.3%)	324 (81.8%)
Monthly income	No income	14(3.5%)	32(8.1%)	46 (11.6%)
	< SLR. 10,000	72(18.2%)	186(47%)	258(65.2%)
	> SLR.10,000	42(10.6%)	50(12.7%)	92 (23.2%)

Differences of the mean values of ADL scores were compared using independent sample t-test by gender and age and results are tabulated in **Table 2**. No significant gender difference of mean values was observed ($p=0.854$). But the mean value of Barthel index for participants between 60-69 years (99.6 ± 1.4) was significantly higher than that of the mean value of participants between 70-100 years (98.46 ± 4.2) ($p < 0.01$).

No gender difference of the mean values of MMSE was found ($p=0.527$) but a slightly higher mean score was found in young old adults compared to old-old adults (27.47 vs 27.23, $p < 0.05$). There was a significant gender difference of the mean values of the CES-D values (9.02 vs 7.30, $p < 0.05$). A slightly higher mean score of WHOQOL-BREF was found in young old adults compared to old-old adults.

Table 2: Instrumental Scores of the study sample by gender and age group

Scales	Variables	N	Mean (SD)	P value
Barthel Index	Female	268	99.12 (2.4)	0.854
	Male	128	99.06(4.0)	
	60-69 years	224	99.60 (1.4)	0.001
	70-100 years	172	98.46 (4.2)	
MMSE	Female	268	27.65 (2.6)	0.527
	Male	128	27.47 (2.6)	
	60-69	224	27.87 (2.5)	0.016
	70-100	172	27.23 (2.9)	
CES-D	Female	268	9.02 (7.08)	0.019
	Male	128	7.30 (6.22)	
	60-69	224	8.64 (7.10)	0.560
	70-100	172	8.23(6.53)	
WHO-QOL	Female	268	301.7 (36.9)	0.222
	Male	128	306.58 (35.9)	
	60-69	224	308.4 (34.4)	0.001
	70-100	172	296.68 (38.4)	

Health measurements of the participants were tabulated in **Table 3**.

Vision problems was the most common health condition among both male and female older persons. Hypertension, cardiovascular diseases, diabetes, and joint diseases were also common in this target population. There were significant gender differences in the prevalence of cardiovascular diseases, joint related diseases and hearing problems.

Table 3: Prevalence of health conditions among study participants (n= 396)

Diseases	Male (n=128)		Female(n=268)		P value
	N	%	N	%	
Cardiovascular Diseases	23	18	19	7.1	.001
Diabetes	13	10.2	42	15.7	.138
Hypertension	45	35.2	112	41.8	.207
Joint related diseases	19	14.8	68	25.4	.018
Blood diseases	0	0.0	1	0.4	.489
Cancer	0	0.0	4	1.5	.165
Renal diseases	4	3.1	4	1.5	.280
Stomach related diseases	8	6.2	23	8.6	.419
Asthmatic conditions	18	14.1	26	9.7	.197
Skin diseases	6	4.7	7	2.6	.278
Psychiatric conditions	2	1.6	2	0.7	.447
Dental diseases	0	0.0	1	0.4	.489

Vision problems	57	44.5	108	40.3	.424
Hearing problems	16	12.5	10	3.7	.001
Memory related difficulties	11	8.6	14	5.2	.197

Discussion

In this study, we assessed health status and QOL of older people in Galle, Sri Lanka were assessed, and examined whether gender and age have any influence on them. Health status and QOL are major indicators that represent the well-being status in the later life. The prevalence of vision problems, hypertension, asthma, diabetes and joint related diseases were high in this target group. Significant gender differences in the prevalence of cardiovascular diseases, joint related diseases and hearing problems were observed. A study conducted in Malaysia showed that the prevalence of chronic illnesses among the older people was as high as 60.1% (20). In India, the situation is similar (21). In the United Kingdom, it was found that the prevalence of heart disease, hypertension, stroke, diabetes and cancer rise rapidly after the age of 60 (22). Therefore, chronic disease conditions are common among the older people and there is a rising need to pay attention for protecting health and well-being of the older people by minimizing adverse effects of chronic diseases found in many developed and developing countries in the world.

In this study we found that there is no gender difference in the physical disability status among the older people. However, a significant difference in the mean scores of ADL was observed among the participants between the age group of 60-69 and age group 70-100, though there was no clinically relevant result. With the aging process physical abilities are gradually declining. However, we have observed that our target population has extremely low prevalence of physical disabilities compared to older population groups in other countries. In our study, less than 2% of the elderly persons were dependents on their daily activities. A study conducted in Singapore revealed that, 17% of older people they investigated were dependents (23). A study conducted in Malaysia found that 15.1% of the older people were dependents (24). Thus, physical capabilities of older people in Sri Lanka are better than that of most other countries. This is probably due to the differences in age composition between populations or high rates of physical activity participation seen in older people in Sri Lanka, but further investigations are needed to confirm our assertions.

Older people participated in this study had reported higher mean score for the MMSE indicating that they have very good cognitive skills. A study conducted in Malaysia shown that, prevalence of cognitive impairment was 22.4% (20). As expected, younger group was better than the older group in their cognitive abilities. Mean scores of the CES-D indicated that, the majority of older people in Galle were free from depressive symptomatology. A study has shown that, depression affects 17.8% of elderly were living in the community (25). There was no gender difference of the mean WHOQOL-BREF values, but those of aged 70 or more years reported slightly lower mean QOL value than those aged 60-69 years indicating that younger old people have somewhat better QOL than older-old people. A study conducted in India revealed that male participants had a higher mean score for QOL as compared to the female participants and the quality of life is better among the individuals who do not suffer from any chronic illness. But in the target population both older men and women seem to have similar QOL.

Limitations

The following limitations were identified in this study. It included assessment using dietary intake of nutrients of two days may not represent their habitual intake and day to day variations of their food consumption. As a result of aging process, elders with declined memory may not have provided full information on actual dietary intake, due to cultural norms and shame. Some elderly people may not have disclosed their real situation with the interviewer. Lack of prior

research studies related to the present study in Sri Lanka also could be a limitation. Some of the selected subjects refused to donate the blood samples, self-reported data on their health status, provided by the participants, may have recall bias and the study excluded subjects who were not capable of physically and mentally responding to the interview schedule (not able to appropriately complete the survey).

Conclusions

Vision problems, cardiovascular diseases, joint related diseases, hypertension and diabetes were prevalent among the older population in Galle district Sri Lanka. Health authorities need to pay attention to these health conditions found in older people and special attention is needed to find, treat and support older women who are suffering from Joint related diseases. Cognitive abilities in this study group is satisfactory. The Quality of Life of older people in Galle seems to be high and it is necessary to maintain this in the future to make older people in Galle healthy and happy.

Acknowledgement: Faculty of Medicine research grant is greatly acknowledged.

References

1. Davies N. Promoting healthy aging; the importance of lifestyle. *Journal of Nursing standard [Royal College of Nursing (Great Britain)]* 2011; 25: 43-49.
2. Gomez LM. Geriatric Nursing, 5th edition, Jitendar P Vij, New Delhi: 2009.
3. World Health Organization. A global movement for the right of the older people, Global aging statistics. Geneva, 2012.
4. World Health Organization. Health of the Elderly in South East Asia, A profile of aging statistics. New Delhi, 2009.
5. Ministry of Health. Annual Health Bulletin 2012, Sri Lanka. Medical statistics unit.
6. John SR. Health status and clinical practice. *Journal of AHA*, 2002; 106:1:5-7.
7. Maryam T, Mohamed A, Ali M. Determinants of Health –related Quality Of Life in elderly in Tehran, Iran. *Journal of BMC Public Health*, 2008; 323-325.
8. Ahmad Al-W, Dag E, Gösta T, Kurt S. The influence of sociodemographic characteristics on well-being and symptoms in a Swedish community: Results from a postal questionnaire survey, *Scandinavian Journal of Primary Health Care*, 1999; 17:4: 201-209.
9. Zare VR, Kokikar P, Romesh B. Health status of the elderly. Comparative study. *International Journal of Community Medicine and Public Health*, 2018; 5-7.
10. Somnath P. Health status and Health care of Elderly Americans. *Journal of Geriatrics*, 2009; 10: 4.
11. Kulathunge RDH, Gunarathna EDTP. Emerging health issues among ageing population in Sri Lanka –A review; *Advance Research Journal of Multidisciplinary Discoveries*.22.0, C-3,2018;15-18.
12. World Health Organization. *WHOQOL* 1997. Available at: <<http://www.who.int/mental-health/media/68.pdf>> [Accessed 27 November 2014].
13. Bowling A. Quality of Life in Older Age: What Older People Say. In: Mollenkopf H., Walker A. (eds) *Quality of Life in Old Age. Social Indicators Research Series*, 2007; 31.
14. Mathew A.et al., Health status and Quality Of Life among older adults in rural Tanzania. *Journal of Global Health Action*, 2010; 3:1.
15. Ediriweera RED, Perera SMSA. Quality of Life in Older Adults Attending a University Family Practice Centre in Sri Lanka. *Journal of Frailty and Aging*, 2018; 7: 134-137.
16. Lekamwasm S, Karunathilaka K, Kankanamge SKP, Lekamwasam V. Physical dependency of elderly and physically disabled; measurement concordance between 10 item Barthel index and 5 item shorter version .*Ceylon Medical Journal*, 2011; 56: 114-118.
17. Kumarapeli V, Senevirathna R, Wijerathna C. Health related quality of life and psychological distress in polycystic syndrome. *British Journal of Gynecology*, 2011;118: 319-328
18. De Silva HA, Gunathilaka SB. Mini Mental State Examination in Sinhalese: a sensitive test to screen for dementia in Sri Lanka. *International Journal of Geriatric Psychiatry*, 2002; 17:2: 134-139.
19. Ferdinando KDAR. Prevalence and correlates of depression in adults of 25-45 years in Kalutara DDHS area. Postgraduate Institute of Medicine, University of Colombo, Sri Lanka (unpublished MD Dissertation).
20. Sherina MS, Rampal L, Mustaqim A. Factors associated with chronic illness among the elderly in a Rural community in Malaysia. *Asia Pacific Journal of Public Health*, 2004; 16:2.
21. Dhananjay K, Hari S. Prevalence of chronic diseases and quality of life among elderly people of rural Varanasi. *International Journal of Contemporary Medical Research* 2018; 5:7:G1-G5.
22. Laura P. et al., The burden of common chronic disease on health related quality of life in an elderly community-dwelling population in the UK. *Journal of Family Practice* 2014; 31:5: 557-563.

23. Chan KM, Pang W S , Ding YY, Choo P. Functional status of the elderly in Singapore. *Singapore Medical Journal*, 1999; 40; 10: 635-638.
24. Salleha K. Community based study on the profile of functional disability among elderly in Sepang, 2001; University of Putra in Malaysia (B.Sc. Thesis).
25. Vinay KC, Edward TC. Prevalence of depressive symptoms among older adults who reported medical cost as a barrier to seeking health care. *Journal of BMC Geriatrics*, 2019; 192.

Oral Presentations

OP 01**Formulation and Evaluation of Herbal Underarm Gel**

Samarathunga S.A.D.I.H.¹, Wijesekera K.^{1#}, Napagoda M.T.², Wijeyaratne W.M.D.G.B.³

¹Department of Pharmacy, Faculty of Allied Health Sciences, University of Ruhuna, Sri Lanka

²Department of Biochemistry, Faculty of Medicine, University of Ruhuna, Sri Lanka

³Department of Microbiology, Faculty of Medicine, University of Ruhuna, Sri Lanka

[#]Corresponding author: kdwijesekera@gmail.com

Background: Sweating is a normal physiological function which helps to regulate body temperature. Bacterial degradation of organic compounds present in the human sweat causes body odour. This imposes a significant negative impact on the quality of life. Therefore, deodorants and antiperspirants are used to reduce body odour. However, synthetic deodorants may cause harmful health effects. *Nymphaea pubescens* (commonly known as “Pink water-lily”) is a plant known for its versatility in therapeutic and cosmeceutical applications due to its rich phytochemical constituents. Extracts of different parts have shown various medicinal activities.

Objectives: To evaluate the antibacterial and anti-oxidant properties of crude methanolic extracts of *N. pubescens* flower petals and formulation and evaluation of a herbal underarm gel.

Methods: Acidified aqueous alcoholic petal extract of *N. pubescens* was employed as antibacterial agent. Phytochemical screening was evaluated using the extract. Five different formulations were used to evaluate anti-bacterial effects by agar well diffusion method. The minimum inhibitory concentration (MIC) was determined by broth microdilution method against *Staphylococcus aureus*, *Escherichia coli* and *Pseudomonas aeruginosa*. Antioxidant property was evaluated by 2,2-diphenyl-2-picrylhydrazyl (DPPH) assay. The stability of the product was evaluated over 45 days.

Results: Qualitative phytochemical screening exhibited the availability of main phytochemicals in the extract. Crude extract of pink water-lily petals revealed high phenolic content of 33.92 ± 0.92 mg GAE/g and flavonoid content of 21.92 ± 2.66 mg QE/g and demonstrated a significant anti-bacterial activity. Formulation demonstrated potent free-radical scavenging activity with 53.99 ± 0.11 mg AAE/g. The prominent antibacterial activity was observed in the formulation containing *N. pubescens* (2% w/v) which exhibited more antibacterial activity against *Staphylococcus aureus* (MIC-156.25 μ g/mL) and *Escherichia coli* (MIC-156.25 μ g/mL) and less activity against *Pseudomonas aeruginosa* (MIC-312.50 μ g/mL). No microbial contamination observed after 45 days.

Conclusions: Secondary metabolites present in the crude extract of *N. pubescens* may reduce body odour. It inhibits the growth of bacteria in sweat due to its prominent antibacterial activity.

Keywords: Antibacterial activity, Antioxidant, *Nymphaea pubescens*, Underarm gel

OP 02**Perceived Nursing Errors and Sleep Quality among Shift Working Nursing Officers in Two Selected Government Hospitals, Sri Lanka**

Nawarathne L.C.^{1#}, Amarasekara A.A.T.D.²

¹*Higher Education Institute Society-Linkage Cell, KIU, Sri Lanka*

²*Department of Nursing and Midwifery, Faculty of Allied Health Sciences,
University of Sri Jayewardenepura, Sri Lanka*

#Corresponding author: lahiruchannaka@yahoo.com

Background: Nurses play key roles to carry out core components of routine, delegated patient care in a clinical setting, where shift work is crucial. Regardless shift work being important, the disturbances to sleep and therein forth the sleep quality of a nurse, compromises rapidly. Level of performance accuracy, with an increased risk of nursing errors in patient care, is affected by the alterations to daily routine/shiftwork among nurses.

Objectives: To assess sleep quality and its association to perceived nursing errors among shift working nursing officers.

Methods: Utilizing pre-tested, standardized, Pittsburgh Sleep Quality Index (PSQI) to assess sleep quality, three visual analogue scales to self-report categorized nursing errors, and a demographic profile assessment was carried out in a descriptive cross-sectional study, using convenient sampling method. Ethical clearance from the Faculty of Medical Sciences, University of Sri Jayewardenepura, Colombo South Teaching Hospital, and permission to study conduct from Homagama Base Hospital were obtained. One-way analysis of variance and descriptive statistics were used using SPSS version 25.0 software.

Results: A total number of 279 individual data were collected. Global PSQI scores reported 60.9% proportion having perceived poor sleep quality, with a minimum zero hours sleep, though having 10.5 maximum hours stayed in bed. Minor, moderate, and severe nursing error mean values were 9 ± 16 , 6 ± 13 and 1 ± 4 respectively. Shifts of longer hours and working in more than one consecutive shift, perceived higher error rates of minor ($p < 0.01$) and moderate ($p < 0.01$) nursing errors. Sleep quality by PSQI was only associated with moderate nursing errors in significance ($p = 0.03$).

Conclusions: Moderate nursing errors perceived by nurses in shift work was only statistically significant to sleep quality by PSQI. Error rates being unreported and not being directly observed may have limited the study's outcomes of interest.

Keywords: Nurses, PSQI, Shiftwork, Sleep Quality, Sri Lanka

OP 03

A Study on the Burnout of Ward Nurses during the Covid-19 Pandemic in the Western Province, Sri Lanka

Fernandopulle M.K.^{1#}, Hanwellage D.N.A.¹, Jayawardana Kankanamge S.S.¹,
Perera J.A.S.M.B.¹, Fernando N.M.²

¹*School of Nursing, International Institute of Health Sciences, Sri Lanka*

²*School of Biomedical Sciences, International Institute of Health Sciences, Sri Lanka*

#Corresponding author: maheshikaushalya10@gmail.com

Background: Burnout is the physical, behavioural, and emotional condition stemming from constant overwork and continual loss of career satisfaction. Higher nurse workload is associated with burnout and job dissatisfaction, which can result in poor patient outcomes. Nurses may be more vulnerable to burnout during the Covid-19 pandemic.

Objectives: To examine the burnout of ward nurses related to Covid-19.

Methods: A descriptive, cross-sectional study was conducted on a study sample of 152 participants, selected through convenient sampling. Maslach Burnout Inventory tool, validated in Sri Lanka was used to collect data as an online form via social media platforms, among nurses working in hospitals in the western province after receiving the ethical clearance from BioInquirer Ethics Review Committee. The data were analyzed with SPSS version 25.0.

Results: Mean age of participants was 29±5 years. The number of days those nurses worked on the weekend during the pandemic shows a 2% increase. In addition to that, 42% of the participants were more worried about their family and friends getting infected by the virus than themselves. Nearly half of the respondents (50.7%) were unhappy with the shift hours after the Covid outbreak compared to before. Despite the difficulties/pandemic, 84.1% of participants were not intending to leave the profession. Mean±SD of subscale scores for each subscale were 14±0.93 (Emotional Exhaustion; EE), 4.40±1.30 (Depersonalization (D)); and 18.20±0.72 (Personal Accomplishment (PA)). This indicates that there is no significant level of burnout among the nurses during the Covid-19 outbreak (cut-off values indicating moderate/high burnout for EE >18, D>6, PA<33).

Conclusions: The findings suggest that the nurses' burnout levels were low in terms of EE and D but high related to PA. Flexible work schedules for nurses may help them be more productive and reduce the risk of burnout.

Keywords: Nurses' burnout, Covid-19, Job performance, Mental health, Patient care

OP 04

Perception and Awareness on the Practices of Obtaining an Informed Consent Prior to Medical Intervention among Hospitalized Patients in Puttalam District, Sri Lanka

Perera J.A.H.M.S.^{1#}, Perera J.A.S.M.B.² and Kaldera H.P.S.R.²

¹*School of Law, Policing and Forensics, Asia Pacific Institute of Information Technology, Sri Lanka*

²*School of Nursing, International Institute of Health Sciences, Sri Lanka*

#Corresponding author: hiruneymsperera@gmail.com

Background: Informed consent is providing information to improve the patient's autonomy in making healthcare-related decisions. Adequate information must be provided on the diagnosis, the proposed treatment, benefits and risks, alternative treatment and any consequences of declining treatment. Healthcare workers may ignore this as a result of busy schedules which would eventually affect the quality of life of the patient.

Objectives: To identify patient's perception and awareness on the practice of informed consent prior to a medical intervention.

Methods: A descriptive, cross-sectional study was conducted on a convenient sample of 141 patients admitted to hospitals in Puttalam district. Data were collected using a self-developed questionnaire and analyzed using SPSS software.

Results: Mean age of participants was 34 years. About 46.8% stated that consent was obtained only for some procedures. Most patients (89.4%) knew that the informed consent is important before initiating a medical procedure. Many knew that obtaining consent is a legal requirement (85.1%). Also, 68.1% agreed that a procedure cannot be conducted without the voluntary consent of the patient. Nevertheless, only 40.4% of the respondents completely understood the explanations. The explanation rarely included an explanation of the alternative procedures, any lifestyle changes after the procedure and consequences of not performing the procedure, as stated by 36.2%. A majority (66.0%) agreed that their family could give consent on their behalf. In contrast, 46.8% of the respondents disagreed that consent from their family alone is sufficient. Written consent is better than verbal consent, as stated by 85.0% of the participants. However, the majority of 59.6% stated that they were satisfied with the informed consent process.

Conclusions: The patients had sufficient knowledge and satisfactory perceptions about informed consent. However, healthcare providers must ensure that the process of obtaining informed consent is complete.

Keywords: *Informed consent, Medical intervention, Perceptions, Knowledge, Patients*

OP 05

Social Support and Quality of Life of Institutionalized and Non-institutionalized Older People: A Comparative Cross-sectional Study

Wickramasinghe D.A.^{1#}, Perera B.², Gamage M.W.K.¹

¹Department of Nursing, Faculty of Allied Health Sciences, University of Ruhuna, Sri Lanka

²Department of Community Medicine, Faculty of Medicine, University of Ruhuna, Sri Lanka

#Corresponding author: dilrukshi.anu5@gmail.com

Background: Social support (SS) enhances Quality of Life (QoL) of older people. Understanding of the variations of SS available for and perceived by institutionalized and non-institutionalized older people in Sri Lanka is important in promoting health of elderly population.

Objectives: To describe and compare relationships of QoL and SS between institutionalized and non-institutionalized older adults in Galle, Sri Lanka.

Methods: A comparative cross-sectional study was conducted using a conveniently selected sample of 70 institutionalized and 70 non-institutionalized older people in Galle. Validated scales of WHOQOL-BREF and Multidimensional Scale of Perceived Social Support (MSPSS) were used to assess QoL and SS of the target groups respectively. Higher scores in MSPSS indicated higher SS.

Results: The mean value of the total QoL scores was higher in non-institutionalized older people compared to that of others (66.4 ± 21.3 vs 59.3 ± 14.4 , $p < 0.05$). The mean value of the total MSPSS score was also higher in non-institutionalized compared to that of institutionalized older people (5.3 ± 0.9 vs 3.9 ± 1.1 , $p < 0.05$). The mean scores of family support (23.1 ± 3.8 vs 12.8 ± 7.3 , $p < 0.05$), support from the friends (19.1 ± 5.1 vs 18.4 ± 4.3 , $p < 0.05$) and support from significant others (22.2 ± 4.7 vs 4.0 ± 1.8 , $p < 0.05$) were higher in non-institutionalized compared to that of institutionalized older people. There was a positive correlation between MSPSS scores and total QoL scores in the non-institutionalized older people ($r = 0.34$, $p < 0.01$), but no such correlation was found between MSPSS scores and total QoL scores in the institutionalized older people ($r = 0.054$, $p = 0.655$).

Conclusions: The QoL of the non-institutionalized older people is better than that of institutionalized older people. One possible reason for this observation is that the SS perceived by non-institutionalized older people is higher than that of institutionalized older people. Social support systems available for institutionalized older people should be strengthened to improve their QoL.

Keywords: Institutionalized older people, Non-institutionalized older people, Quality of life, Social support, Sri Lanka

OP 06

**Phytochemical, Proximate and HPTLC Analysis of
Plectranthus zeylanicus Benth (Iriweriya) Grown in Sri Lanka**Hapuarachchi S.D.^{1#}, Silva P.D.S.A.², Kodithuwakku N.D.¹, Perera P.K.¹¹*Department of Dravyaguna Vignana, Institute of Indigenous Medicine,
University of Colombo, Sri Lanka*²*Department of Pharmacy, Faculty of Allied Health Sciences, University of Ruhuna, Sri Lanka*[#]*Corresponding author: dr.sdhapuarachchi@iim.cmb.ac.lk*

Background: *Plectranthus* species belonging to the family *Lamiaceae* are commonly used in traditional medicine preparations. *Plectranthus zeylanicus* belonging to this family is erroneously used in formulations due to the taxonomic ambiguity and morphological confusion with other *Plectranthus* species including *Plectranthus amboinicus*. Though they are morphologically similar, they have different therapeutic and pharmacological uses. Hence inappropriate use of them can lead to undesirable adverse effects.

Objectives: To determine phytochemical, proximate and High Performance Thin Layer Chromatographic (HPTLC) profiles for the preliminary identification of *P. zeylanicus* Benth (Iriweriya) which is commonly used to treat respiratory, gastrointestinal, dermatological and neurological disorders.

Methods: Mature whole aerial parts were obtained from western province, Sri Lanka, authenticated from National Herbarium, Peradeniya and oven dried. Extracts were obtained with methanol, acetone and distilled water as per WHO Guidelines. Preliminary phytochemical screening, proximate analysis and HPTLC were conducted to each extract.

Results: Phytochemical screening revealed that alkaloids, terpenoids, triterpenes and anthraquinones are present in all extracts while tannins, phenols, diterpenes and flavonoids are present only in methanol and aqueous extracts. Saponins and carbohydrates were available only in aqueous extract while proteins and glycosides were found only in acetone extract. Proximate analysis revealed that total ash, acid insoluble ash, water soluble ash, loss on drying, extractability in methanol, acetone and water were 16.12±0.91%, 0.64±0.02%, 7.19±1.27%, 17.09±0.14%, 16.82±0.23%, 5.13±0.13% and 60.27±1.72% w/w, respectively. Normal phase HPTLC fingerprint of methanol extract showed 11 peaks with methanol: distilled water: acetic acid (2:5:3) while acetone extract showed 10 peaks for distilled water: methanol: acetone (4:2:4). Reverse phase HPTLC fingerprint of aqueous extract showed 9 peaks with methanol: distilled water (7:3). Each was done in triplicate and results were expressed as mean ± standard deviation.

Conclusions: Therefore, the above parameters can be used as preliminary tools for identification and authentication of *P. zeylanicus* as raw materials in Ayurveda manufacturing.

Keywords: *High Performance Thin Layer Chromatography, Phytochemical screening, Plectranthus zeylanicus Benth, Proximate analysis*

Acknowledgement: The study was funded by the Institute of Indigenous Medicine, University of Colombo, Rajagiriya, Sri Lanka (Grant No: RMC/18/02).

OP 07**Prevalence and Perceived Associated Factors of Lower Back Pain in Nurses, Gampaha District, Sri Lanka**

Kannangara A.D.[#], Rodrigo C.D., Jayaram U., Amarasena L.B.I.S., De Silva S.
International Institute of Health Sciences, Sri Lanka

[#]*Corresponding author: dinushikannangara1997@gmail.com*

Background: Lower back pain is one of the commonest occupationally caused musculoskeletal diseases among nurses globally. Mostly nurses working in Intensive Care Units are more prone to this condition. Risk factors for causing lower back pain can be categorized into individual risk factors and occupational risk factors. Occupational risk factors consist of physical and psychological origin.

Objectives: To investigate the perceived prevalence and associated factors of lower back pain among nurses working in the Gampaha district, Sri Lanka.

Methods: This was a descriptive, cross-sectional study conducted during October 2020 among 132 female registered nurses, aged between 20-55 years and who worked for at least one year at a hospital in Gampaha district. A simple random sampling method was used. An online survey was conducted using a researcher prepared, self-administered questionnaire. The data were analyzed using Microsoft Excel and SPSS version 20.0.

Results: The study sample consisted of 132 (82.5%) female and 28 (17.5%) male nurses. Results showed a 61.3% prevalence of back pain among the population, while 38.7% reported not having back pain at present. Besides individual risk factors which were commonly identified, sustained sitting (59.9%), frequent bending (59.2%), lifting heavy objects (32%), inadequate rest (62.4%), heavy workload (57.4%) bad posture for a long time (51.9%), sudden movements (35.2%), lifting heavy loads (27.8%) and other factors (7.2%) were identified.

Conclusions: Lower back pain is a common health issue among nurses in Gampaha district, showing 61.3% of prevalence among the study population. Perceived associated factors for the occurrence of lower back pain identified in the study were inadequate rest with the heavy workload, sustained sitting, bad postures for a long time, frequent bending, lifting heavy objects, and sudden movements.

Keywords: *Lower back pain, Nurses, Prevalence, Risk factors*

OP 08

Antibacterial Potential of *Myristica fragrans* (Nutmeg) Pericarp Extract Against Selected Bacterial StrainsWeerakoon W.M.T.^{1#}, Perera W.P.R.T.¹, Wanigasekara D.N.²¹Department of Indigenous Medical Resources, Faculty of Indigenous Health Sciences and Technology, Gampaha Wickramarachchi University of Indigenous Medicine, Sri Lanka²Department of Biochemistry, Faculty of Medicine, University of Ruhuna, Sri Lanka

#Corresponding author: tharindra.chem1803@kln.ac.lk

Background: Due to the increasing bacterial resistance to currently available antimicrobial agents, there is a necessity to find out alternative antibacterial drugs with different chemical compositions and modes of action. Plant extracts play a significant role as potential antibacterial agents that can be developed into antibacterial drugs. *Myristica fragrans* (Nutmeg) is such a plant which has been used in indigenous medicinal systems as a medication for wound healing and diarrhoea.

Objectives: To investigate the *in vitro* antibacterial potential of *M. fragrans* pericarp which is a waste in spice production industry and to determine the Minimum Inhibitory Concentration (MIC) values and Minimum Bactericidal Concentration (MBC) values to determine whether the test extract is bactericidal or bacteriostatic.

Methods: Ethanolic extract of *M. fragrans* dried pericarp was tested against two Gram negative bacterial strains and two Gram positive bacterial strains namely *Staphylococcus aureus* (ATCC 29213), *Bacillus cereus* (ATCC 21366), *Escherichia coli* (ATCC 25922) and *Salmonella typhimurium* (ATCC 39183), respectively using MTT (3-(4, 5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide) assay. Chloramphenicol was used as the positive control. Mixture without the extract was used as the negative control. The mechanism of antibiosis of the test extract was determined using MBC/MIC ratio. Statistical analysis was done by using IBM SPSS 23.0 software.

Results: All tested bacterial strains showed to be susceptible to ethanolic extract of *M. fragrans* pericarp extract. The obtained MIC values of *S. aureus*, *B. cereus*, *E. coli* and *S. typhimurium* are 550±27, 450±35, 425±34 and 375±23 mg/L, respectively. The MBCs are 1500±30, 1700±30, 1500±25 and 1700±30 mg/L. All strains were recognized as bacteriostatic.

Conclusions: These preliminary results disclose the ethnobotanical significance of *M. fragrans* pericarp and its potential to be used in antibacterial drug development.

Keywords: *M. fragrans* pericarp, MIC, MBC

OP 09**Three Newly Designed Methods to Calculate Percentage Haemolysis of Red Cell Concentrates before Transfusion**

Fernando C.A.^{1#}, Hewamana U.I.¹, Dissanayake D.M.D.T.¹, Rathnaweera S.¹,
Samanthilake W.A.², Kuruppu K.K.S.², Jayasekara J.K.M.B.¹

¹*Department of Medical Laboratory Sciences, Faculty of Allied Health Sciences, General Sir John Kotelawala Defence University, Sri Lanka*

²*Department of Quality Management, National Blood Centre, Sri Lanka*

#Corresponding author: c.anastasia.fdo@gmail.com

Background: The degree of hemolysis must be checked prior to transfusion of Red Cell Concentrates (RCC), to prevent potential adverse effects that can occur in patients due to transfusion of haemolysed blood. To calculate percentage hemolysis, plasma hemoglobin (Hb) must be determined, which is measured using a Plasma/Low Hb photometer (LHBP) which is currently at the National Blood Centre (NBC).

Objectives: To introduce three new alternative methods to calculate percentage haemolysis of RCC in blood banks.

Methods: Applying principles of Hb estimation, three new alternative methods are designed to estimate plasma Hb of RCC and named as visual Hb Colour Scale (CS), Spectrophotometric Calibration Graph (SCG) and Standard haemolysate Capillary Tube Comparison (SCTC). A standard haemolysate was prepared by using an un-expired RCC pack. Using the standard haemolysate, a series of Hb concentrations from 0.1 - 1.0 g/dL were prepared. Among the blood packs received for the determination of percentage haemolysis, 68 blood packs were used in the newly designed three alternative methods. The data obtained was used to draw simple linear regression graphs for all three methods. The results generated by each method was compared with LHBP.

Results: A strong correlation was observed ($p < 0.001$) between newly developed methods and LHBP. All three simple linear regression models built had $p < 0.001$ significance with beta values closer to 1. The SCTC method highly correlated with the LHBP method as per the R^2 values of the simple linear regression models built considering gold standard method and the three alternative methods.

Conclusions: Three newly developed alternative methods can be used to estimate plasma Hb in RCC with higher degree of accuracy. Of all three methods, SCTC method showed superior performance.

Keywords: *Capillary tube comparison, Haemoglobin colour scale, Percentage of haemolysis, Plasma/Low haemoglobin photometer, Red cell concentrate*

OP 10

Effect of Metal Ions and Detergents on *In vitro* Protease Inhibitory Activity of Black Gram Cultivated in Sri Lanka

Jayasinghe J.D.M.S.¹, Chandrasena U.S.D.¹, Kumari K.D.K.P.², Rajapakse S.³, Suresh T.S.^{1#}

¹Department of Biochemistry, Faculty of Medical Sciences, University of Sri Jayewardenepura, Sri Lanka

²Department of Basic Sciences, Faculty of Allied Health Sciences, General Sir John Kotelawala Defence University, Sri Lanka

³Department of Molecular Biology and Biotechnology, Faculty of Science, University of Peradeniya, Sri Lanka

[#]Corresponding author: sugandhika@sjp.ac.lk

Background: Black gram or Undu (*Vigna mungo*) is a commonly consumed pulse in Sri Lanka which exhibited high protease inhibitory activity.

Objectives: To assess the effect of metal ions and detergents on the activity of protease inhibitors present in black gram cultivated in Sri Lanka.

Methods: Whole seed samples of the local cultivar, Anuradha which is bred in Sri Lanka were collected from Field Crops Research and Development Institute at Mahailuppallama. The crude protein extract of the seed sample (20%) was prepared using distilled water and subjected to trypsin inhibitory assay using Hammerstein casein as the substrate. Three different metal ions (1 mM) and four detergents (1% w/v) were added to separate portions of the crude protein extract and after 30 minutes, trypsin inhibitor activity (TIA) of each sample was measured.

Results: The TIA of 20% black gram extract was $73.21 \pm 0.29\%$. The TIA of the samples mixed with ferric chloride, mercuric chloride and barium chloride were $67.77 \pm 0.8\%$, $62.99 \pm 0.89\%$ and $72.58 \pm 0.97\%$, respectively. The TIA of the samples treated with detergents, Triton X100, Tween-80, Tween-20 and sodium dodecyl sulphate (SDS) were $65.14 \pm 0.95\%$, $66.24 \pm 0.30\%$, $70.50 \pm 0.88\%$ and $74.10 \pm 0.22\%$, respectively. Of the metal ions, ferric chloride and mercuric chloride showed a considerable reduction in the inhibitory activity, while barium chloride did not exert a considerable impact. Among the detergents added, Triton X100, Tween-80 and Tween-20 exerted a decline in the activity of trypsin inhibitors, while SDS indicated a slight increase in the inhibitory activity.

Conclusions: The result of the current study revealed that that ferric chloride, mercuric chloride, Triton X100, Tween-80 and Tween-20 exert a negative effect on the activity of protease inhibitors present in black grams cultivated in Sri Lanka.

Keywords: Black gram, Detergents, Metal ions, Protease inhibitory activity

OP 11**Coping Strategies among Patients with Cancer: A Cross-sectional Study done in Teaching Hospital Karapitiya, Southern Sri Lanka**

Weeratunga E.^{1#}, Senadheera C.², Hettiarachchi M.³, Perera B.⁴

¹*Department of Nursing, Faculty of Allied Health Sciences, University of Ruhuna, Sri Lanka*

²*Department of Psychiatry, Faculty of Medicine, University of Ruhuna, Sri Lanka*

³*Nuclear Medicine Unit, Faculty of Medicine, University of Ruhuna, Sri Lanka*

⁴*Department of Community Medicine, Faculty of Medicine, University of Ruhuna, Sri Lanka*

#Corresponding author: eranthiw@ahs.ruh.ac.lk

Background: Coping strategies used by cancer patients to handle the disease contribute to the quality of their remaining life. The literature presents different coping styles and their effects on cancer patients; constructive coping leads to better psychosocial health and improved compliance to treatment.

Objectives: To identify coping strategies used by patients with cancer and their correlates.

Methods: Four hundred heterogeneous cancer patients were recruited from the Oncology unit, Teaching Hospital, Karapitiya, Galle. An interviewer-administered questionnaire including 28-item Brief COPE scale was used to identify the coping strategies and correlates. Higher scores of the scale indicate higher adaptive coping (e.g. instrumental support, emotional support, etc.) or maladaptive coping (e.g. self-distraction, substance use, etc.) whereas lower scores indicated lower coping.

Results: Mean±SD age of the participants was 56±11.92 years. Ninety one percent (n=365) of participants had used a higher level of adaptive coping, and 247 (61%) patients had used a higher level of maladaptive coping. More than 80% of the sample had used adaptive coping strategies, such as instrumental support (n=380), emotional support (n=377), acceptance (n=352), and religion (n=320). Among maladaptive coping, 89% used venting (n=357) and 72% (n=287) used self-distraction. Age was negatively correlated with adaptive coping (e.g. planning and active coping) ($p<0.001$). Females had higher adaptive coping (65.5 ± 6.6) than males (60.6 ± 7.1); the married group had the highest adaptive coping (64.1 ± 6.8) compared to the unmarried group (60.9 ± 8.4) ($p<0.001$). Participants with a higher level of education tend to have a higher adaptive coping (64.8 ± 7.1) than the lower educated group (61.0 ± 6.7); adaptive coping was higher among the unemployed subjects (66.0 ± 6.2) than those with employment (62.0 ± 7.4) ($p<0.001$).

Conclusions: Majority of cancer patients used at least one adaptive coping strategy in the management of the disease. Younger, females, and married patients utilized more adaptive coping; unemployed and patients with more years of education used many adaptive coping methods. Culturally adaptive coping strategies need to be explored in future studies.

Keywords: *Adaptive coping, Brief COPE, Maladaptive coping, Sri Lanka*

Acknowledgement: Faculty Research Grant-2013, Faculty of Medicine, University of Ruhuna.

OP 12

The Patterns of Breakfast Consumption and Their Association with Concentration and Memory of Ordinary Level Students of Christ King College, Pannipitiya

Pirannavan R.^{1#}, Prabodhi A.K.A.¹, Perera K.B.K.C.¹, Samaranayake D.B.L.²

¹University of Colombo, Sri Lanka

²Department of Community Medicine, Faculty of Medicine, University of Colombo, Sri Lanka

[#]Corresponding author: pirannavan@gmail.com

Background: The positive effect of consumption of breakfast in academic performance, specially memory and concentration of school children is widely accepted. However, there is a dearth of evidence in objective assessment of memory and concentration.

Objectives: To describe the patterns of breakfast consumption and their association with concentration and memory of Ordinary Level students of Christ King College, Pannipitiya.

Methods: A descriptive cross-sectional study was conducted among 102 students in grades 10 and 11 of Christ King College, Pannipitiya. Data were collected using a self-administered questionnaire and four activities which are parts of Montreal Cognitive Assessment (MoCA) and Saint Louis University Mental Status Examinations (SLUMS). Frequencies were generated by cross-tabulations to generate descriptive statistics and analyzed with Chi Square distribution test.

Results: Out of the 102 students, 37% of students had consumed breakfast only 3 days or less in weekdays. Of them, 28.94% (n=11) had felt sleepy and 28.94% (n=11) had headache when they missed their breakfast. 'No appetite' (60.52%) followed by 'no time' (36.84%) were mentioned as the common reasons for skipping breakfast. Most of the students (65.69%, n=67) had breakfast at home. The 8.82% of students (n=9) had taken breakfast after 10.00 a.m. Students who consumed breakfast on that day performed better in objective assessment of memory and concentration than those who did not, and this difference was found to be significant ($p=0.029$). Self-perceived memory scores of those who had their breakfast were better than those who missed their breakfast ($p=0.363$); self-perceived concentration scores of those who missed their breakfast were better than those who had their breakfast ($p=0.423$), however, those differences were not statistically significant.

Conclusions: Considerable proportion of students do not consume breakfast regularly. Lack of appetite and lack of time are the possible reasons. Consumption of breakfast is important for memory and concentration of students.

Keywords: Breakfast, Concentration, Memory, Students

OP 13

Risk Assessment of Bioaccumulation of Toxic Metals in Rice Grains (*Oryza sativa*) in a CKDu Endemic Area; A Study in Mihintale Division, Sri Lanka

Perera P.L.R.A.[#], Perera W.P.R.T., Liyanage J.A.

Department of Indigenous Medical Resources, Faculty of Indigenous Health Sciences and Technology, Gampaha Wickramarachchi University of Indigenous Medicine

[#]*Corresponding author: rajitha_2019@kln.ac.lk*

Background: Chronic kidney disease of unknown etiology (CKDu) is a heterogeneous disorder affecting kidney structure and its functions. CKDu has rapidly spread throughout Sri Lanka in the past two decades and has become predominant in the North Central Region. Food or water borne diseases are one of the key issues in food safety assurance in Sri Lanka. Pesticides and heavy metals play an important role in modern agriculture and food safety.

Objectives: To evaluate the toxic metal contamination status in the polished rice samples (BG 300) grown in the Maradankulama area.

Methods: Maradankulama GN division was selected based on the available information on medical/hospital records, which has the highest number of CKDu patients in the Mihintale division as the sampling area. A survey protocol was developed. Thirty polished rice samples (BG 300) were collected from the households subject to three paddy areas in the Maradankulama GN area according to the random stratified sampling method. Heavy metal concentrations (Chromium, Lead, Arsenic and Cadmium) of rice samples were analyzed by inductively coupled plasma mass spectrometry.

Results: The male CKDu patients were higher than females (Male - 57.15%; Female - 42.85%). All CKDu patients subjected to the survey in the area belong to the farming community within the age group of 60-70 years. In Maradankulama Cr (7.268 ± 0.046), Pb (1.923 ± 0.209), As (0.064 ± 0.009) and Cd (0.026 ± 0.003) were detected in mg/kg levels. Among the analyzed metals in the rice samples, mean Cr and Pb contents have exceeded the maximum permissible level (MPL) according to the Codex Alimentarius commission guidelines.

Conclusion: Arsenic and Cadmium contents in the rice samples were well below the Codex standard. However, rice grain samples have been contaminated with some nephrotoxic metals such as Chromium and Lead and long-term exposure to the toxic metals may generate a risk for kidney damage in people.

Keywords: CKDu, Codex, Contamination, *Oryza sativa*, Toxic metals

Acknowledgement: CKDu Information & Research Centre, Sri Lanka (Grant No. NARP/19/KU/FS/01) is gratefully acknowledged for awarding a research grant.

OP 14

Assessment of Health Risk using the Daily Intake of Nephrotoxic Trace Metals via Drinking Water: A Case Study in Rideemaliyadda-South, CKDu Endemic Area, Sri Lanka

Karunadasa H.T.D.R.^{1#}, Botheju W.S.M.², Dayananda M.D.N.R.², Perera W.P.R.T.², Liyanage J.A.²

¹College of Chemical Sciences, Institute of Chemistry Ceylon, Sri Lanka

²Department of Chemistry, Faculty of Science, University of Kelaniya, Sri Lanka

[#]Corresponding author: dilu.ruwangika@gmail.com

Background: Chronic kidney disease of uncertain aetiology (CKDu) has been reported in Sri Lanka for more than two decades. Although it has been a significant health burden, this is not associated with any known factors of CKD such as hypertension, diabetes, and illegal drug abuse.

Objectives: To assess the health risk of the intake of potential nephrotoxic elements via drinking water using the chronic daily intake (CDI) of selected metals in Rideemaliyadda-South, a CKDu endemic area, Sri Lanka.

Methods: Drinking water samples (n=30) were collected from Rideemaliyadda-South GN division, Badulla district, Sri Lanka. Cd, Pb, Cr and Cu concentrations of the water samples were analyzed using Inductively Coupled Plasma Mass Spectrometry (ICPMS-Agilent-7800). All the analyses were done in triplicates. Mean CDI, Hazard Quotient (HQ), Hazard Index (HI) for an adult human (oral) were measured using the concentrations of selected nephrotoxicants.

Results: The mean concentrations obtained for Cd, Pb, Cr and Cu were 0.12 ± 0.02 , 0.45 ± 0.07 , 0.16 ± 0.00 and 1.95 ± 1.17 $\mu\text{g/L}$, respectively. All the mean values of selected nephrotoxic elements complied with the maximum permissible levels recommended by WHO. The mean CDI values ($\mu\text{gkg}^{-1}\text{day}^{-1}$) for Cd, Pb, Cr and Cu were 4.4×10^{-6} , 1.65×10^{-5} , 5.87×10^{-6} , 7.15×10^{-5} and the calculated HQ values were ranged as 4.4×10^{-6} , 4.71×10^{-6} , 1.96×10^{-6} , 1.79×10^{-5} , respectively. The calculated HQ and HI values for all the selected nephrotoxic elements were below 1.0 (1.29×10^{-5}) and were within the acceptable level recommended by WHO.

Conclusions: The nephrotoxic element concentrations, HQ, and HI values were within the recommended values, indicating no potential harmful health risks to the residents in the study area. However, long-term use of water may pose a hazard to human health. Therefore, it is recommended to regularly monitor the water quality for contaminations before using for drinking purposes.

Keywords: CKDu, Hazard index, Hazard quotient, Nephrotoxic, Oral daily intake

OP 15

Prototype Design of a Monorail Delivery Robot for Local Hospitals of Sri Lanka

Senadheera S.M.T.D.¹, Pramodi J.P.M.¹, Seneviratne R.W.², Kumara K.J.C.^{1#}

¹*Department of Mechanical and Manufacturing Engineering, Faculty of Engineering,
University of Ruhuna, Sri Lanka*

²*Department of Surgery, Faculty of Medicine, University of Ruhuna, Sri Lanka*

#Corresponding author: kumara@mme.ruh.ac.lk

Background: Most of the old public hospitals established in the country were not built to automate the activities efficiently. Manual labour handles various medical items such as blood bags, drugs, or samples. Therefore, the transportation of multiple items between departments or sections takes longer, especially when crowded. Technological improvement in the modern health care industry with the utilization of robots to replace manual processes have shown many benefits. However, a primary survey conducted with different healthcare professionals attached to local hospitals revealed that the delivery of small items is inefficient and delayed. The need for this kind of automation system is also addressing the pandemic situation as automated systems can operate with a minimum human touch.

Objective: To identify the most suitable delivery robot and design a mobile robot to transport small items such as medicine, patient's test samples, blood bags considering the existing typical building established structure of local hospitals in Sri Lanka.

Methods: The Teaching Hospital Karapitiya was selected to collect the physical requirements of the setup. Based on the current requirements, specifications of the new automated delivery system were generated. Among the present industrial robots, a monorail robot was identified as the best suitable solution. Then, we followed a mechatronics system design procedure that includes designing the delivery robot's locomotion, monorail moving path, charging-loading-unloading docks, CAD models, control system, drive and communication electronics, and microcontroller program to automate the robot and human-man interface (HMI) to reserve and acknowledge delivery. In addition, the complete system includes a monitoring, safety, and warning system.

Results: A monorail mobile robot developed can carry items with a total weight of 10kgs with the automated path is designed. Although the overall cost of the system and the number of simultaneous delivery requests determine the number of mobile robots required to operate the system, it is required two robots minimum as one robot required to operate while another robot is in charging and in case of emergency. One robot can drive with 1m/s maximum speed, and its battery system is enough to run for 10hrs continuously. The initial prototype developed consists of two docking stations that also equipped with the HMIs and charging.

Conclusions: This paper presents the design of a monorail delivery robot with the required operation infrastructure and the prototype developed with principal components and features. The proposed solution for the manual material handling between the ward, pharmacy, blood bank and the laboratory reduce the transportation delays and labour, thereby increasing the efficient use of the human resources. Furthermore, we planned to demonstrate the prototype monorail delivery robot established in the mechatronics lab of the university to health care professionals. Moreover, the monorail delivery robot system can easily be installed with minor construction and installation time in any hospital setup.

Keywords: *Automation of hospitals, Delivery robot, Manual hospital labour, Monorail robot*

OP 16

Incidence of Falls and its Association with Quadriceps Muscle Strength among Institutionalized Older People: A Cross-sectional Study from Colombo District

Kandegge I.M., Pramodhya L.G.O., Perera G.A.D.[#]

Faculty of Allied Health Sciences, General Sir John Kotelawala Defence University, Sri Lanka

[#]*Corresponding author: amaradamayanthi@gmail.com*

Background: Older people who dwell in institutions may experience higher morbidity issues and mortality rates compared to community-dwelling older people. Falls and fall-related injuries are one of the most leading causes of disability and death among older people. As one of the most powerful lower limb muscles, the quadriceps play an important role when preventing falls among older people.

Objectives: To determine the incidence of falls and its association with quadriceps muscle strength among older people who dwelt in most leading two elderly institutions in the Colombo district.

Methods: A cross-sectional study was conducted under the non-probability convenient sampling method at Salina Alwis and Sahana Udaya elderly institutions with the older people who completed inclusion criteria. Ethical clearance was first obtained by the Ethical Review Committee of General Sir John Kotelawala Defence University. A total of 60 participants aged 65 years and above were included. A fall risk assessment questionnaire was used to obtain fall history within 6 months. Left and right quadriceps muscle strength was measured using a modified sphygmomanometer test.

Results: Among 56.7% females and 42.3% males, the mean \pm SD age of the participants was 76.67 \pm 6.23 years. The incidence of falls among older people in both elderly institutions was 38.3%. The mean values of quadriceps strength among falls and non-fall groups of older people were 116.00 mmHg and 161.13 mmHg, respectively. A significant difference in mean quadriceps strength was obtained among the falls and non-falls groups.

Conclusions: The results revealed that fall prevalence in the two institutions was higher than the global prevalence (28-35%) of falls in the elderly. Deprivation of quadriceps muscle strength in older people directly affects their fall incidence. The results are important to prevent falls and to improve self-confidence by improving quadriceps strength in institutionalized elderly in Sri Lanka.

Key words: *Elders homes, Falls prevalence, Modified Sphygmomanometer test, Older people, Quadriceps muscle strength*

OP 17

Caregivers' Perception on Barriers and Facilitators for Provision of Care for Residents in Aged Care Homes in Galle District: A Qualitative Study

Gamage M.W.K.[#], Sundarapperuma S.M.T.D., Madushanthi H.J.H., De Silva K.K.P.M.K.,
Nirmanani K.G.P.

Department of Nursing, Faculty of Allied Health Sciences, University of Ruhuna, Galle, Sri Lanka

[#]Corresponding author: mkgamage@yahoo.com

Background: There is an increase in the older population living in aged care homes in Sri Lanka with the recent trend in institutionalization. Caregivers play a vital role in care delivery for older people in aged care homes. Hence, identification of barriers and facilitators to provide care for residents would be useful. This will facilitate development of measures to improve the care for residents and sequentially to improve well-being of older people.

Objectives: To explore the caregivers' perception on barriers and facilitators for provision of care for residents in aged care homes in Galle district.

Methods: A Qualitative descriptive exploratory study was conducted in selected aged care homes in Galle district. Ten in-depth interviews were conducted with caregivers (n=10) until the saturation point was achieved. These sessions were conducted using a semi structured guide and each session ran for 60-90 minutes. All sessions were audio recorded and transcribed verbatim. Thematic analysis approach was used to analyze data.

Results: Eight sub themes were emerged under two major themes which are barriers and facilitators. The themes emerged under the theme barriers were inadequate facilities, economical constraints, lack of willingness of the individuals to become a caregiver and, lack of in-service programmes for caregivers. The themes emerged under the domain of facilitators were religious believes towards donations, supportive leadership, continuous support from social service department and positive institutional values. Mainly they highlighted on inability to obtain proper medical treatment and lack of transport facilities as inadequate facilities.

Conclusions: Caregivers perceived several structural, personal, and institutional barriers that hindered the provision of care for residents in aged care homes. Continuing in-service programmes for caregivers should be implemented to change their personal attitudes.

Keywords: *Aged care homes, Barriers, Care, Caregivers, Facilitators*

OP 18

The Role of Physical Activity on Physical Fitness and Functional Ability in Community-dwelling Older People in Western Sri Lanka: A Structural Equation Model

Wickramarachchi B.^{1#}, Siop S.², Perera B.³, Perera R.⁴

¹*Department of Nursing, Faculty of Allied Health Sciences, University of Ruhuna, Sri Lanka*

²*Department of Nursing, Faculty of Medicine and Health Sciences,
Universiti Malaysia Sarawak, Malaysia*

³*Department of Community Medicine, Faculty of Medicine, University of Ruhuna, Sri Lanka*

⁴*Department of Psychiatry, Faculty of Medicine, University of Sri Jayawardanapura, Sri Lanka*

#Corresponding author: biwickramarachchi@ahs.ruh.ac.lk

Background: The role of physical activity in enhancing physical fitness and functional ability of older people in upper income countries is well-researched. However, studies on interactions between physical activity (PA), strength, balance and functional status of the community-dwelling older people in low and middle-income countries are limited.

Objectives: To test the pathways in how the PA acts on improving physical fitness and functional abilities of community-dwelling older people in Sri Lanka.

Methods: A cross-sectional survey was done involving 880 community-dwelling older people (60 years and above) in Colombo, Sri Lanka. The Blair model was used to test the influence of PA on strength, anthropometrical measures, balance and functional status. Structural Equation Modelling (SEM) was evaluated using AMOS software.

Results: The final SEM model included five latent factors and 14 co-variances. Goodness of Fit Index (GFI), Adjusted Goodness of Fit Index (AGFI), Comparative fit index (CFI), Tucker-Lewis Index (TLI), Normal Fit Index (NFI), Incremental fit index (IFI) and Root Mean Square Error of Approximation (RMSEA) values of the model were 0.95, 0.93, 0.93, 0.91, 0.92, 0.93 and 0.05, respectively, indicating a good model fit. Physical activity and age directly affect strength ($\beta=0.61$) and anthropometrical parameters ($\beta=-0.41$), and indirectly affect physical functions ($\beta=-0.35$) and Balance ($\beta=0.52$) ($p<0.05$). Results suggest that strength is the direct contributor for good balance and physical functions in older people. There was a significant correlation between strength and age to the expected direction ($\beta=-0.36$, $p<0.05$).

Conclusions: Strength is the main contributor of PA. Muscle-strengthening PAs support enhancing the balance and functional performances in older people. Such physical activity programs need to be promoted among the community-dwelling older people in Sri Lanka.

Keywords: *Blair model, Older people, Physical activity, Physical fitness*

OP 19

Depression, Anxiety, Stress and Perceived Mental Healthcare Need of Sri Lankan Undergraduates Studying in Selected Countries Affected by Covid-19

Amarasingha A.A.D.S.^{1#}, Peiris H.H.¹, Amarasingha A.A.B.N.²

¹*Department of Medical Laboratory Science, Faculty of Allied Health Sciences, University of Ruhuna, Sri Lanka*

²*Grodno State Medical University, Belarus*

#Corresponding author: dinushasubhashini@ahs.ruh.ac.lk

Background: Due to Covid-19 pandemic, all universities have either postponed or cancelled physical activities and moved rapidly into online delivery mode. It has severely affected the mental health of undergraduates.

Objectives: To determine depression, anxiety, stress and perceived mental healthcare needs of Sri Lankan undergraduates studying in selected countries affected by Covid-19.

Methods: A cross-sectional study was conducted with Sri Lankan undergraduates studying in selected countries affected by Covid-19 from 01st of July to 31st of December 2020. Snowball sampling technique was used. An online self-reported questionnaire was used for data collection. Depression, anxiety and stress were assessed using Depression Anxiety & Stress Scale (DASS 21). Perceived mental healthcare need was assessed by 4 items on a 3-point Likert scale. Data were analyzed with ANOVA and t-test using SPSS.

Results: A total of 187 Sri Lankan undergraduates were enrolled consists of 26.7% from India, 39.6% from Russia and 33.7% from Sri Lanka. Females were 61.5%. Of 11.58% had depression (6.32%-mild; 5.26%-moderate), 11.58% had anxiety (5.26%-mild; 3.16%-moderate; 3.16%-severe) and 3.16% had stress (2.11%-mild; 1.05%-moderate). There was no statistically significant difference in depression, anxiety and stress among undergraduates with reference to gender, age, type of degree, marital status, status of living or studying country. About 47.6% of participants thought that it would be nice to talk to someone about their worries of Covid-19; 67.4% thought that it is necessary to get mental health support if one panics in lieu of pandemic; 84.5% thought that it would be beneficial if mental health professionals help undergraduates during Covid-19 pandemic and 74.3% suggested to obtain mental health support to undergraduates who are highly affected by Covid-19.

Conclusions: Prevailing Covid-19 pandemic has caused considerable stress, depression and anxiety among undergraduates. There is a need to address mental healthcare needs of undergraduates during Covid-19 pandemic.

Keywords: Anxiety, Covid-19, Depression, Sri Lankan Undergraduates, Stress

OP 20

Maternal Factors, Cord Lipids and C-reactive Protein as Determinants of Foetal Growth in Infants Born in a Teaching Hospital, Sri Lanka

Kamila M.A.F.R.^{1#}, Hewawasam R.P.², de Silva M.H.A.D.³, Iresha M.A.G.⁴

¹*Department of Medical Laboratory Sciences, Faculty of Allied Health Sciences, University of Ruhuna, Sri Lanka*

²*Department of Biochemistry, Faculty of Medicine, University of Ruhuna, Sri Lanka*

³*Department of Paediatrics, Faculty of Medicine, University of Ruhuna, Sri Lanka*

⁴*Department of Obstetrics and Gynaecology, Faculty of Medicine, University of Ruhuna, Sri Lanka*

[#]*Corresponding author: rahmaameen94@gmail.com*

Background: Obese children are at a higher risk of becoming obese and developing metabolic syndrome in adulthood. Previous research revealed that foetal growth depends on genetic, intrauterine and maternal metabolic factors. Therefore, finding the impact of modifiable maternal metabolic factors on the foetal growth and controlling them in advance would be useful in the management of childhood obesity. Although limited studies are reported from other Asian countries, none have been carried out in Sri Lanka.

Objective: To determine the effects of maternal factors, umbilical cord lipids and C-reactive proteins (CRP) on foetal growth in a tertiary care hospital in Southern Sri Lanka.

Methods: A prospective cohort study was conducted at the professorial obstetrics and gynaecology unit of the Teaching Hospital Mahamodara (THM) using convenient sampling among all the mothers who were admitted for their confinement and their newborn babies. Fasting blood samples from mothers before their delivery and umbilical cord blood samples were collected to measure fasting blood sugar (FBS), lipid profile and CRP. Birth weight (BW), birth length (BL), head circumference (HC), occipital frontal circumference (OFC), abdominal circumference (AC) and hip circumference (HpC) as anthropometric measurements and Capillary blood sugar (CBS) level of their newborns were obtained. Ultrasound scan (USS) reports and bed head ticket (BHT) were used to collect socio demographic details and other information. Data were analysed using SPSS version 23.0.

Results: Among the 50 newborns, 28 (56%) were females and 42 (84%) were appropriate for their gestational age. Among the maternal population, five (10%) had CRP above normal level (26 mg/dL). Maternal factors such as maternal age, pre pregnancy body mass index, gestational weight gain, haemoglobin (Hb), FBS concentration, high density lipoprotein and low-density lipoprotein had a significant association with the foetal growth. However, the highest positive correlation was observed between the maternal haemoglobin concentrations with BW ($r=0.281$, $p=0.048$), BL ($r=0.319$, $p=0.024$), HC ($r=0.355$, $p=0.011$), OFC ($r=0.322$, $p=0.023$) and AC ($r=0.351$, $p=0.012$).

Conclusions: Since maternal Hb concentration showed the highest positive correlation with foetal anthropometric parameters, it is worth exploring further.

Keywords: Cord blood lipid profile, Foetal growth, Haemoglobin, Maternal lipid profile

OP 21

Psychological Experiences of the Patients with Colorectal Cancer at Apeksha Hospital, Maharagama

Mannaperuma D.K.[#], Ahalagolla A.M.K.N., Nilmini K.H.G., Weerathunga D.W.K.C.,
Saumika M.A.R., De Silva B.S.S.

Department of Nursing, Faculty of Health Sciences, The Open University of Sri Lanka

[#]Corresponding author: dilanikalpanee@gmail.com

Background: Colorectal Cancer (CRC) is the third most common cancer worldwide and is equally common in men and women. In Sri Lanka, CRC is one of the top five cancers. Being a patient with CRC, patients have different psychological experiences due to the disease condition and the treatment process.

Objectives: To describe the psychological experiences of the patients with CRC at Apeksha Hospital, Maharagama.

Methods: Eighteen patients with CRC purposefully recruited for this qualitative study. All the patients were within the first two years of their disease and the age limits were 35 to 55 years. They had experienced surgery due to the CRC and undergone at least more than three cycles of chemotherapy. Semi-structured interviews were conducted to collect data and data analysis was done using Colalizzi analysis method.

Results: Three themes emerged from the findings as living with uncertainty, constant worrying and making sense of reality. Fear towards death, remaining responsibilities to full fill for their loved ones and fear about the future of their children and spouse caused living with uncertainty. Changes in appearance, repentance about the past lifestyle and inability to accept diagnosis even after years were created the constant worrying. Consider the disease condition as an opportunity to understand the reality of life and identifying the priorities and willingness to fulfil remaining responsibilities as much as possible were created the making sense of reality.

Conclusions: Most of the patients with CRC encountered negative psychological experiences. However, amidst these negative experiences some patients have gradually begun to make sense of positive thoughts about life. These findings highlight the importance of regular counselling programs to enhance psychological well-being of patients with CRC.

Keywords: *Patients, Colorectal cancer, Psychological experiences*

OP 22

Perceived Quality of Healthcare among Residents in Aged Care Homes in Galle District-A Qualitative Study

Madushanthi H.J.H.[#], De Silva K.K.P.M.K., Gamage M.W.K., Sundarapperuma S.M.T.D.,
Nirmani K.G.P.

Department of Nursing, Faculty of Allied Health Sciences, University of Ruhuna, Sri Lanka

[#]Corresponding author: madhushani122@gmail.com

Background: The older population living in aged care homes is increasing with population ageing and demographic changes. Measures to improve the quality of life of older people has attracted the interest of researchers while the quality of healthcare that older people receive will play an important role in it. Therefore, the perception of residents on quality of healthcare will play a vital role to introduce new measures to improve the quality of life of older people.

Objectives: To explore perceived quality of healthcare among residents in aged care homes in Galle district.

Methods: This qualitative descriptive exploratory study was carried out with a purposively selected sample of residents in aged care homes in Galle district. Eight focus group discussions were carried out with 48 participants using a semi-structured interview guide until reach the saturation point. Data were audio-recorded and transcribed verbatim. The content analysis approach was used to analyze data.

Results: More than 50% of the study participants were females aged between 70-80 years. Residents discussed both negative and positive perspectives towards the quality of health in aged care homes. The themes including socio-cultural expectations, physical and mental well-being and caregivers' medical competence were associated with positive perception of quality of healthcare. Lack of financial independence, poor social and institutional support and inadequacy of continued medical and transport facilities were associated with negative perspective towards the quality of healthcare.

Conclusions: The findings of this study emphasized that the perception of residents on quality of healthcare at aged care homes primarily relies on socio-cultural contexts, individual health and caregivers' medical competence. The findings deserve a greater attention of health and social welfare policy-makers for strengthen the social and economic independence of residents of aged care homes to enhance the quality of healthcare.

Keywords: *Aged care homes, Quality of healthcare, Residents*

OP 23

Phytochemical Analysis, In vitro Antioxidant and Sun Screening Activity of Different Solvent Extracts Obtained from *Bauhinia racemosa* (maila) Leaves Grown in Sri LankaHettihewa S.K.[#], Piyarathna M.I.P.*Department of Pharmacy, Faculty of Allied Health Sciences, University of Ruhuna, Sri Lanka*[#]*Corresponding author: krishnathi2001@yahoo.com*

Background: *Bauhinia racemosa* belongs to the family Fabaceae, is locally known as “Maila” in Sri Lanka and it is widely used as a medicinal plant in Ayurvedic medicine.

Objectives: To evaluate phytochemical profile, *in vitro* antioxidant and sun screening activity of different solvent extracts of *Bauhinia racemosa* leaves.

Methods: The defatted crude extracts of 70% aqueous acetone and 80% aqueous methanol were prepared and subjected to preliminary phytochemical screening tests. Total phenolic, flavonoid contents and antioxidant activity of defatted crude extracts were determined by using Folin-Ciocalteu method, aluminum chloride colorimetric method and 2,2-diphenyl-1-picrylhydrazyl (DPPH), ferric reducing antioxidant power (FRAP) assays, respectively. *In vitro* sun screening activity of the extracts was expressed as sun protective factor (SPF) values calculated by using Mansur equation. Results were analyzed by using SPSS software version 20.0. Multiple comparisons were evaluated pairwise at $p=0.05$, and the values were considered significantly different.

Results: The preliminary phytochemical screening revealed that the presence of carbohydrates, phenolic compounds, alkaloids, flavonoids, phytosterols and saponins in both leaf extracts. The results of the total phenolic content for two different extracts were 5765.5 ± 12.6 (70% acetone) and 5341.6 ± 107.4 (80% methanol) mg Gallic acid equivalents (GAE)/100 g dry weight (DW) of leaves. Total flavonoid contents for the two different extracts were 3261.6 ± 175.1 (70% acetone) and 3044.7 ± 35.9 (80% methanol) mg Catechin equivalents (CAE)/100 g DW of leaves. *In vitro* antioxidant activity for two different extracts were 11.7 ± 1.3 (70% acetone) and 11.8 ± 2.1 (80% methanol) mmol trolox equivalents (TE)/100 g DW of leaves for DPPH assay. For the FRAP assay, 12.9 ± 0.3 (70% acetone) and 15.5 ± 0.8 (80% methanol) mmol Fe (III)/100 g DW of leaves. The 80% methanolic leaf extract of *B. racemosa* showed promising sun screening activity (SPF= 39.6 ± 0.4) compared to 70% acetone leaf extract (SPF= 36.3 ± 0.3) whereas Dermatone (positive control) (SPF= 38.1 ± 0.7) at 1.5 mg/mL concentration.

Conclusions: Findings revealed that both extracts were rich in phytochemicals and 80% methanolic leaf extract of *B. racemosa* grown in Sri Lanka possess promising *in vitro* antioxidant and sun screening activity and recommended to further investigations.

Keywords: Antioxidant, *Bauhinia racemosa*, Sun screening activity

Acknowledgement: Faculty of Allied Health Sciences, University of Ruhuna research grant-2018.

OP 24

The Cross-cultural Adaptation of the Begley and Glackens's Assertiveness Scale for use with Nursing Students in Sri Lanka

Kumara W.G.C.^{1#}, Warnakulasuriya S.S.P.²

¹*Department of Nursing & Midwifery, Faculty of Allied Health Sciences, General Sir John Kotelawala Defence University, Sri Lanka*

²*Faculty of Nursing, University of Colombo, Sri Lanka*

#Corresponding author: ckumara@kdu.ac.lk

Background: Assertiveness is recognized as a crucial skill in the nursing profession since it is capable of reinforcing interprofessional relationships, preventing workplace violence, reducing work stress, improving professional efficacy, leadership skills, autonomy and job satisfaction. When assertiveness is inculcated among nursing students, it will pave the way for a sustainable career. Hence, utilizing a proper mechanism to assess the assertiveness among Sri Lankan nursing students is a valuable investment.

Objectives: To adapt the Begley and Glackens's Assertiveness Scale cross culturally into Sinhala language in order to use among nursing students in Sri Lanka.

Methods: Permission to translate, cross-culturally adapt and use the 28-item assertiveness scale was obtained from the developers. The content and consensual validity of translated version were assessed with a two rounded Delphi using five experts and a consensus evaluation. Based on the Delphi Process, items for the Sinhalese assertiveness scale were selected based on the criteria: (i) if 70% or more of the re-ratings were in category 0–3, that item was omitted or re-worded to make it acceptable. If re-worded, the Delphi process was repeated for that item, and (ii) if 70% or more of the re-ratings were in categories 4–6 and 7–9, that item was preserved.

Results: Sinhalese version of assertiveness scale showed maximum content validity of all the individual items (I-CVI=1.0) and maximum overall content validity (S-CVI/UA = 1.0; S-CVI/Ave = 1.0). All the items were in category 7-9 and retained. According to suggestions made by some experts, only re-wording of some items was done in order to retain the conceptual meaning when translated to Sinhala.

Conclusions: The Sinhala version of Begley and Glackens's Assertiveness Scale has shown good content and consensual validity where it can be utilized as a validated tool to measure the assertiveness among nursing students in the Sri Lankan context.

Keywords: *Assertiveness, Begley and Glackens's assertiveness scale, Sri Lankan nursing students*

Poster Presentations

PP 01

Knowledge about Postpartum Psychiatric Illnesses among Antenatal Mothers in Teaching Hospital Mahamodara

Ranasinghe R.K.K.^{1#}, Jayasekara A.²

¹*Department of Nursing, Faculty of Allied Health Sciences, University of Ruhuna, Sri Lanka*

²*Department of Psychiatry, Faculty of Medicine, University of Ruhuna, Sri Lanka*

#Corresponding author: kaushalyaranasinghe1112@gmail.com

Introduction: Postpartum psychiatric illnesses affect the well-being of both the mother and the infant. Knowledge about those diseases is the key to improve maternal and infant health during postpartum period. Therefore, it is necessary to have some knowledge about postpartum psychiatric illnesses for a better outcome and reduce complications to the child.

Objectives: To assess the knowledge about postpartum psychiatric illnesses among antenatal mothers in Teaching Hospital Mahamodara.

Methods: This is a descriptive cross-sectional study conducted among antenatal mothers who attended the antenatal clinics and antenatal wards in Teaching Hospital, Mahamodara. A self-developed, pre-tested and self-administered questionnaire was used to collect data. The convenience sampling method was used to select the sample. Independent sample t-test, one way ANOVA and correlation coefficient were used for data analysis.

Results: Majority of participants (167, 55.5%) represented the <21 years age group. With regard to the occupation, 194 (64.5%) were unemployed and 106 (35.2%) were employed. Almost all the participants were Sinhala Buddhists. From the sample, 155 (51.5%) have educated up to A/L and 145 (48.2%) have educated up to O/L. From the sample, 162 (53.8%), 123 (40.9%) and 14 (4.7%) has 0-25, 26-50 and 51-75 knowledge score category, respectively. One hundred and eighteen (38%) participants have got information about postpartum psychiatric illnesses from midwives. There was a significant association of mothers' knowledge with occupation and educational level ($p < 0.05$). The knowledge about available resources for prevention and treatments were low.

Conclusions: The awareness regarding psychiatric illnesses among antenatal mothers was considerably low. This may probably the reason for high prevalence of postpartum psychiatric illnesses among Sri Lankan antenatal mothers. The most common reasons for that are low level of education and occupation according to this study.

Keywords: *Antenatal mothers, Knowledge, Postpartum psychiatric illnesses*

PP 02

A Study on Gap between Theoretical Knowledge and Clinical Skills as Perceived by Student Nurses in a Private Nursing School in Gampaha District, Sri Lanka

Thevarasa D.[#], Shaffaaf F., Oshmi K.H., Warnakulasuriya K.C., Nanayakkara K.C.
International Institute of Health Sciences, Sri Lanka

[#]*Corresponding author: dayanijathevarasa01@gmail.com*

Background: The gap between theory and clinical skills is a typical problem encountered by nursing students. In general, it could be defined as the discrepancies which occur during implementation of clinical skills, in complying with theoretical knowledge. Accordingly, it could reduce the quality of care provided. Thus, it is vital to address this ongoing issue to enhance the standard of nursing education.

Objectives: To identify the factors contributing to the gap between theoretical knowledge and clinical skills, as perceived by student nurses in Gampaha district, Sri Lanka.

Methods: Quantitative, cross-sectional research design was applied. A total of 115 nursing students from a private nursing school at Gampaha district, who had attended clinical placements for more than 6 months were included. Stratified sampling method was applied. A self-administered questionnaire was used for data collection. The areas assessed in the questionnaire were nursing school, clinical setting and personality related factors. The questionnaire was developed by referring to evidence-based peer reviewed articles. A pilot study with ten participants was conducted to improve the validity. Data were analyzed using Microsoft Excel and SPSS software version 22.0.

Results: Of the total, 87 were females and 91.3% agreed to the existence of a theory-practice gap. Fifty-two participants had chosen that “lecturers provide inadequate knowledge on real life clinical situations” and simulation was the least frequently used teaching method. Among the participants, 62.6% stated that the allocated practicum time in nursing school was insufficient. Out of the participants, 90.4% concurred that the current curriculum should be upgraded. However, 53% of the participants were satisfied with the equipment available within the nursing school. Most frequent problem encountered in the clinical setting was “procedures not carried out in the standard way” (67%). Furthermore, 60.9% of the participants were dissatisfied with the support gained from clinical supervisors. Of the sample, 53% agreed that, being anxious affected their clinical performance negatively.

Conclusions: According to the perception of the nursing students, there is a gap between the theoretical knowledge and clinical skills. It is suggested to promote practical teaching methods, evaluate the standards of clinical settings and to conduct attitude development programs. Further studies are recommended to gain a more detailed insight to the issue and to overcome it.

Keywords: *Clinical education, Clinical placement, Curriculum, Nursing students, Theory-practice gap*

PP 03

Parents' Perceptions about their Involvement in Pre-school Aged Children's Education in Sri Lanka: A Qualitative Study

Ekanayake E.H.M.R.K.^{1#}, Mudiyanse R.M.¹, Wickramasinghe V.P.²

¹*Faculty of Medicine, University of Peradeniya, Sri Lanka.*

²*Faculty of Medicine, University of Colombo, Sri Lanka.*

#Corresponding author: rkekanayaka1992@gmail.com

Background: Early childhood education has become a vital integral robust part of education literally around the world. Child development and education are intrinsically linked and greatly influenced by the behaviour of parents. The education system and social expectations influence parenting style and parents' involvement in education of pre-school children.

Objectives: To explore perceptions of parents regarding parental involvement in pre-school aged children's education in Sri Lanka.

Methods: This qualitative study involved ten in-depth interviews and two focus group discussions with 24 parents. They were purposively selected parents of pre-school aged children from Kandy district. Interviews based on a pre-tested semi-structured interviewer guide were audio-recorded with permission, transcribed and analyzed by thematic analysis approach.

Results: The major theme "Parental involvement in pre-school aged children's education" was classified under three subthemes; parental responses on children's achievement, parental responses on children's failures and parental aid for education. Parents have diverse approaches to address their children's physical, cognitive, literacy, psychological and social aspects of development. Parents' behaviours correlate with authoritative, authoritarian, permissive or neglectful type of parenting.

Conclusions: This study recognizes a range of effective and ineffective behaviours of parents in dealing with children's pre-school education. These findings will be useful for parents' education programs and to design tool for quantitative study at national levels.

Keywords: *Education, Parental involvement, Pre-school aged children, Qualitative study*

PP 04

Knowledge and Practices towards Dementia Care among Undergraduate Nurses in a Private Healthcare Institute in Sri Lanka

Thumbowila C.L.[#], Fathimath F., Randeniyage S., Sameera A.G.L.A.
Department of Nursing, International Institute of Health Sciences, Sri Lanka.

**Corresponding author: chamudithumbowila@gmail.com*

Background: Worldwide, 50 million people have dementia and there are nearly 10 million new cases every year. Living with dementia has a tremendous effect on a person socially, psychologically and practically. Nursing care is critical in meeting needs and promoting a quality care system.

Objectives: To assess the knowledge and practices towards dementia care among nurses.

Methods: A cross-sectional quantitative descriptive study was conducted among 100 private and government sector nurses aged 18 to 60 years following a degree at a private healthcare institute, and convenience sampling technique was used with a self-administrated questionnaire. Data was analyzed with SPSS software version 25.0.

Results: Out of 100 participants, 93% were females. It was identified that 14% had dementia patients in their family and 71% had no experience with personal caring, however 61% had gained professional caring experience. Only 18% got trained in caring for patients with dementia. The majority (86%) correctly identified the definition of dementia. Awareness of the correct types of dementia, signs and symptoms, and the causes of dementia were 80%, 72% and 78%, respectively. Half of the sample was aware of correct dementia treatments, while 46% believed that psychotherapy will benefit. 50% believed that dementia patients are more prone to get depression, while 40% believed that patients with dementia should live in nursing homes. Considering practices, 66% used appropriate communication skills. Furthermore, 50% responded by showing photos, 18.2% with brief explanations and 16% offering corrections and suggestions as the management. The majority (52%) suggested that splitting the activities into simpler tasks would greatly aid.

Conclusions: Majority expressed positive aspects in caring patients with dementia. A satisfactory level of knowledge was identified, but there is a need for improving the practices among nurses.

Keywords: *Dementia, Knowledge, Nurses, Practice*

PP 05

Awareness and Attitudes towards First Aid on Road Traffic Accident among General Public in Gampaha District, Sri Lanka

Perera J.A.S.M.B.[#], Siyambalapitiya M.C., Fernando M.A.R., Kaldera H.P.S.R.
School of Nursing, International Institute of Health Sciences, Sri Lanka

[#]Corresponding author: sandaneymbperera@gmail.com

Background: First aid is the immediate assessment and interventions when the most ideal treatment cannot be provided. The goals are to preserve life, alleviate suffering, prevent further illness or injury and promote recovery. The first to encounter the injured during an accident is the public. Therefore they must know how to provide first aid to minimize the burden of injury following road traffic accidents.

Objectives: To assess the awareness and attitudes on first aid in road traffic accidents among the general public.

Methods: A descriptive, cross-sectional study was conducted using a convenient public sample (n=324) living in Gampaha district. Data were collected through a validated questionnaire. The self-administered questionnaire was circulated via social media platforms and analyzed using SPSS software.

Results: Most of the participants (54.4%) were between the ages 20 to 39 years and more than half of them (52.5%) were females. All participants were at least ordinary level qualified. Out of the respondents, 98.8% have heard about first aid and majority (96.9%) believed that first aid is important. Stop bleeding and maintenance of breathing were the priorities in saving the life of an injured according to 51.9% and 19.1%, respectively. According to 44.6% of the participants, no response when called/touched and no movements were the criteria to determine consciousness. Regarding attitudes, only 49.4% of the sample stated that they were willing to provide first aid. Another 21.6% explained that they lack confidence to provide first aid. Additionally, 61.7% pointed out that making a mistake is a concern that may prevent them from providing first aid. Nevertheless, 69.8% of the sample think that lay people should be trained in first aid and are willing to attend a training program.

Conclusions: The general public had satisfactory awareness but unclear attitudes towards the provision of first aid. Training programs must be conducted for the general public to educate about techniques which will be useful during an emergency.

Keywords: *Attitudes, Awareness, First aid, Road traffic accidents*

PP 06

Incorrect Uses of Herbal Medicine and Study of Consequences: A Review

Udahapuvinda B.M.M.S.H.K.[#], Weerasooriya W.M.B.

[#] *Faculty of Indigenous Health Sciences and Technology, Gampaha Wickramarachchi
University of Indigenous Medicine, Sri Lanka*

[#]*Corresponding author: sucharithahemali@gmail.com*

Background: A type of medicine that uses herbs, part of herbs or products that contain active ingredients of plant is known as herbal medicine. Due to high demand and less availability of crude authentic drugs, practice of substitution and adulterations are increasing day by day and use of controversial medicinal plants has been reached by considerable percentage in herbal industry. With this background several number of cases of adverse effects due to misuse of herbal materials have been recorded worldwide.

Objectives: To identify the incidents due to incorrect uses of herbal medicine and to determine the causes for misuses and minimize them.

Methods: This review was conducted in accordance with the preferred reporting items for systematic reviews and electronic bibliographic databases such as PubMed and Allied & Complementary Medicine Database. Clinical reports, short case studies, reviews, case series, and editorials were critically assessed which are published in last decades. This was done through 21 reviewed articles and clinical reports, short case studies and case series in index journals which are published in last thirty years. The articles which published before 1990 and other peer reviewed articles were excluded.

Results: In early 1993, *Aristolochia sp.*, had been mistakenly used instead of *Stephania tetrandra*. Nephrotoxicity case had been reported due to consumption of *Aristolochia pistolochia* by the patient without under medical supervision. Many cases were reported in India, due to misleading of nomenclature. Similarly, there are 08 major causes of incorrect uses of herbal medicine have been identified as incorrect identification of medicinal plants, excessive usage of herbal medicine, use of incorrect plant as substitutes, practice of harmful adulterations for commercial purpose, non-identified chemical constituents of raw materials, self-prescribed herbal medicine without medical supervision, unethical marketing strategies through the media and lack of awareness about "herb – drug" interactions.

Conclusions: Use of parallel advanced knowledge systems such as Botany, Phyto-chemistry, Pharmacognosy, Toxicology, Pharmacovigilance and monographs for the identification of correct medicinal plants and strengthening policies and regulation in standardization of herbal pharmaceuticals could be assisted to minimize the misuses of herbal medicine.

Keywords: *Controversy, Herb-drug interactions, Herbal medicine*

PP 07

Knowledge, Attitudes and Behavioural Changes towards Covid-19 among General Public: A Cross-sectional Study Online Survey

Siyambalapitiya M.C.^{1#}, Perera J.A.S.M.B.¹, Fernando M.A.R.¹, Fernando N.M.²,
Balakrishnan-Prashanth R.³, Weerasekara D.A.P.R.²

¹*School of Nursing, International Institute of Health Sciences, Sri Lanka*

²*School of Biomedical Sciences, International Institute of Health Sciences, Sri Lanka*

³*School of Physiotherapy, International Institute of Health Sciences, Sri Lanka*

#Corresponding author: Christinesiyambalapitiya@gmail.com

Background: Covid-19 is a new strain of coronavirus that caused an outbreak of respiratory illness. Several measures were implemented to avoid the disease. Countries started to advice people to practice social distancing, wear face masks, hand hygiene and to avoid crowded places. Different people showed different attitudes towards this.

Objectives: To study the knowledge, attitudes and to identify the behavioural changes towards Covid-19 among people with online access in Sri Lanka.

Methods: A mixed methods design was used. Online questionnaire was circulated among general public. Eleven participants were interviewed to understand the behavioural changes during Covid-19 outbreak. The quantitative data collected were analysed using Microsoft Excel and SPSS software version 25.0. The qualitative data were thematically analysed using QDA miner lite.

Results: A total of 339 participants completed the survey. Educational level of the participants (28.9%) is diploma level or above. From the participants, 70.5% knew that the first Covid-19 diagnosis was in Wuhan, China. About 90.3% knew the symptoms of coronavirus disease and 88.5% knew that it spreads through respiratory droplets. Nevertheless, only 30.4% knew that Covid-19 was caused by SARS-CoV-2 virus. From the participants, 20.6% displayed negative attitude towards infected patients. Most respondents stated that the infected should be isolated (78.1%) and separately treated (88.8%). Among the participants, 74.0% strongly agreed about their role in protecting the health of the community. Majority of the participants stated that they exhibit behavioural changes like wearing a mask, handwashing and social distancing at public places, while others stated that they would prefer to stay at home. The respondent stated frequent hand washing, wearing masks, avoiding crowded places, always maintaining a distance of one-meter, fumigation and maintaining personnel hygiene would help to prevent being infected.

Conclusions: The findings revealed an adequate level of knowledge and satisfactory behavioural changes towards Covid-19. Attitudes towards Covid-19 were a mixture of both positive and negative viewpoints.

Keywords: Attitudes, Behaviours, Coronavirus, Covid-19, Knowledge

PP 08

Pharmacognostical Study and Antacid Potency of Aqueous Extract of *Desmodium triflorum* Linn

Chathurika M.G.S.¹, Jayasuriya W.J.A.B.N.^{1#}, Arawwawala L.D.A.M.² and Suresh T.S.³

¹Department of Pharmacy and Pharmaceutical Sciences, Faculty of Allied Health Sciences, University of Sri Jayewardenepura, Sri Lanka

²Herbal Technology Section, R & D Complex, Industrial Technology Institute, Sri Lanka

³Department of Biochemistry, Faculty of Medical Sciences, University of Sri Jayewardenepura, Sri Lanka

[#]Corresponding author: banukie@sjp.ac.lk

Background: *Desmodium triflorum* (Heen-Undupiyaliya) is a small, prostrate perennial herb which belongs to the family Lamiaceae. The plant has been in folkloric use including gastric ailments.

Objectives: To analyze phytochemical profile and *in vitro* antacid potency of aqueous extract (AE) of whole plant of *D. triflorum*.

Methods: A detailed anatomical study and powder microscopy was performed. Dry powder (50 g) of whole plant was refluxed using distilled water for four hours. Crude AE was subjected for (a) preliminary phytochemical screening and (b) quantification of total polyphenol (TPC) and flavonoid content (TFC) using standard protocols. In addition, neutralizing effects on artificial gastric acid (AGA) were determined. Neutralization capacity was evaluated via the titration method of Fordtran's model and the samples at 37°C were titrated with 0.1N HCl and the mean volumes of HCl required to reach pH of 3.00 were determined. A modified model of Vatie's artificial stomach was used to determine the duration of consistent neutralization of AGA. A commercially available antacid was used as the positive control and distilled water served as the negative control. Statistical analysis was performed using SPSS software version 25.0.

Results: Fibers and calcium oxalate crystals were highly abundant components observed in the powdered samples and dicotyledon cellular structure was observed under anatomical studies conducted. Polyphenols, flavonoids, tannins, alkaloids, saponins, terpenoids, steroids and cardiac glycosides were present in AE. TPC and TFC of AE were 0.69 mg gallic acid equivalents/g and 0.95 mg quercetin equivalents/g, respectively. Different concentrations of the AE possessed significant ($p < 0.001$) antacid potencies. Dose dependent increase in duration of consistent neutralization was observed in AE. AE at a dose of 58.0 mg/mL has exhibited the highest neutralizing capacity and higher duration of consistent neutralization ($p < 0.001$) among the tested doses.

Conclusions: *D. triflorum* rich in phytochemicals and poses significant neutralization capacity.

Keywords: Antacid potency, Artificial gastric juice, *Desmodium triflorum*, Fordtran's model, Vatie's artificial stomach model

PP 09

Analysis of Cultural Encounter of the Senior and Junior Student Nurses

Senarathne H.S.^{1#}, Meegoda M.K.D.L.²

¹*Department of Clinical Nursing, Faculty of Nursing, University of Colombo, Sri Lanka*

²*Faculty of Allied Health Sciences, University of Sri Jayewardenepura, Sri Lanka*

#Corresponding author: shereensenarathmel@email.com

Background: Cultural diversity is a challenge that all healthcare workers face worldwide. Cultural encounters should have been included in nursing curricula to improve nurses' cultural competence in the face of this challenge.

Objectives: To analyze the level of cultural encounter of the first year (junior) and third year students (senior), who were studied in the School of Nursing, Kurunegala & Vavuniya and to identify how current nursing education is underpinned to improve cultural encounter of student nurses.

Methods: A descriptive cross-sectional study was carried out in nursing schools in Kurunegala and Vavuniya, Sri Lanka. According to the Rao Soft online calculator, 150 first-year students and 150 third-year students from both schools were recruited using the technique of systematic random sampling. A pre-tested, validated self-administered questionnaire was used to collect data and data were analyzed using SPSS software version 22.0.

Results: The response rate was 100%. In both the senior and junior batches, the majority of the sample (n=300) were females, Sinhalese, and Buddhists. The mean score of the cultural encounter of senior student nurses was 3.92 (± 0.28) and the mean score of the cultural encounter of beginners was 3.63 (± 0.44). The independent sample t-test results revealed that there was no significant relationship between student nurses' learning years (senior or junior) and cultural encounters ($p=0.067$).

Conclusions: Cultural encounters were at the moderate level of the first-year student nurses along with senior student nurses and there was no significant relationship between the learning year and the level of encounter. Since cultural encounters are a critical component of improving healthcare workers' cultural competence, it is recommended that nursing curricula be evaluated to identify available opportunities for cultural encounters for student nurses, and nursing curricula be expanded to provide more opportunities for student nurses to engage in cultural experiences.

Keywords: *Cultural encounter, Junior student nurse, Senior student nurse*

PP 10

Knowledge, Attitude and Practices Regarding Nutrition Labels in Ready-to-eat Pre-packaged Solid Food among Government EmployeesFernando M.G.D.V.¹, Fernando M.P.S.^{1#}, Fernando W.W.G.M.¹, Pathirana A.C.A.²¹*Faculty of Medicine, University of Colombo, Sri Lanka*²*Health Promotion Bureau, Colombo*#*Corresponding author: poornisfernando@gmail.com*

Background: The nutrition transition has changed the dietary pattern of individuals to consume more pre-packaged food, which has led to increased mortality and morbidity due to non-communicable diseases. Therefore, the practice of reading nutrition labels guides individuals to healthier choices.

Objectives: To assess the knowledge, attitude and practices regarding nutrition labels in ready-to-eat pre-packaged solid food products among government employees in Ministry of Megapolis and Western Development.

Methods: A descriptive cross-sectional study was conducted among 105 government employees in the ministry, selected by simple random sampling. Socioeconomic state, knowledge, attitude and practices regarding nutrition labels were assessed using a self-administered questionnaire. Knowledge, attitude and practices were categorized into 'satisfactory' ($\geq 80\%$) and 'unsatisfactory' ($< 80\%$) groups based on a scoring system determined by a clinical nutritionist. Data were analyzed using chi-square test and the statistically significant level was considered as a $p < 0.05$.

Results: The percentage of employees with 'satisfactory' knowledge, attitude and practices were 44.8%, 86.7% and 31.4%, respectively. More employees were able to correctly interpret the directly displayed information in a model label (serving size-85.7%, amount of saturated fat in 100g- 82.9%, calories in one serving- 71.4%) compared to the values that had to be calculated (calories in 2 servings-68.3%, amount of sugar in 1 cookie-68.3%). Although not statistically significant, 'satisfactory' practice was higher among unmarried (31.9%), females (33.8%), age category; 21-40 years (31.9%) and those who had tertiary education (36.7%). 'Satisfactory' practice regarding nutrition labels was significantly associated with higher job categories (senior management level) and those with a monthly income above Rs. 50,000. 'Satisfactory' level of knowledge was associated with good practice regarding nutrition labels ($p < 0.05$).

Conclusions: The study reveals variations between nutrition label related knowledge, attitude and practices. Although the majority had satisfactory attitude towards nutrition labels, knowledge and practices were not at a satisfactory level.

Keywords: *Attitude, Knowledge, Nutrition label, Practices*

PP 11

Knowledge on Practice of Phlebotomy among Nursing and Biomedical Students in Gampaha District, Sri Lanka

Fernando E.S.^{1#}, Kuruwitage G.S.¹, Rathnayake M.¹, Das C.V.¹, Mahalingam N.²

¹*School of Biomedical Sciences, International Institute of Health Sciences, Sri Lanka*

²*Department of Biomedical Sciences, International Institute of Health Sciences, Sri Lanka*

#Corresponding author: sherenafernandez12@gmail.com

Background: Phlebotomy, the act of drawing blood through venipuncture, is one of the most common procedures conducted in the healthcare facilities. Venipuncture is essential for the diagnosis and treatment for various diseases. Possessing basic knowledge and skills required for blood drawing, using appropriate equipment can help the phlebotomist or nurse reduce the chances of possible mishaps that may occur during the procedure.

Objectives: To assess the knowledge of nursing and biomedical students on phlebotomy.

Methods: This was a descriptive cross-sectional study, conducted among 100 nursing and biomedical students at International Institute of Health Sciences, within the age group of 18-35 years in Gampaha district, Sri Lanka. A self-administered questionnaire consisted of 20 close ended questions in English language, was distributed. Data were analyzed using Microsoft Excel.

Results: Out of the 100 participants, 83% of them have stated that the most common vein used for venipuncture is median cubital vein which was the correct response. More than half of the participants have mentioned that 3cc syringe is suitable to draw blood from infants, which should be winged infusion set. Meantime, in a question asked on the steps of preparing a patient before venipuncture, over one-third stated that they should place a finger over the vein to guide the shaft of the exposed needle which is unacceptable due to disinfection protocols. When considering the scores pertaining to knowledge and practice, many students have accurately responded to questions regarding knowledge (83%) than practice (60%), which showed the insufficient practice on phlebotomy.

Conclusions: There is a room for improvement in the knowledge on phlebotomy practices of nursing and biomedical students. Organizing workshops and training sessions will be useful for nursing and biomedical students as well as for practicing nurses and phlebotomists.

Keywords: *Biomedical science, Knowledge, Nursing, Phlebotomy, Venipuncture*

PP 12

Assessing Knowledge, Practice and Usage of Pain Relievers among Students in a Private Educational Institute in Sri Lanka

Adhikaram A.M.S.T.[#], Rajaratnam S., Chathurangani U.L.H., Mahendran N., Yapa Y.M.A.C.,
Fernando W.J.I.

School of Nursing, International Institute of Health Sciences, Sri Lanka

[#]Corresponding author: thamodasaras@gmail.com

Background: Pain relievers are medications that use in different ways to alleviate various forms of body-experienced pain. Over-the-counter analgesics widely used by the public are paracetamol, opioids and non-steroidal anti-inflammatory drugs. University students are constantly under pressure to work hard to achieve their goals, leaving little room for a minor illness which could lead to the consumption of analgesics as a 'quick fix' together with a typical student's social life.

Objectives: To assess the knowledge, practice and usage of pain relievers among students in a private educational institute in Sri Lanka.

Methods: A quantitative, cross-sectional study was conducted with a sample of 100 students who are studying in the second year and third year willing to share their information using convenience sampling method. Data were collected by a questionnaire containing 30 close ended questions using a google form.

Results: Out of the surveyed sample, majority (84%) of students used oral tablets rather than topical and Ayurvedic balms and oils to relieve pain. Of the total, 78% of students used pain relievers for headache and 32% used for muscle pain. Majority (67%) of students practiced less often to take pain relievers for acute pain. Most students (69%) used pain relievers less often proving they had knowledge on harmfulness of using pain relievers. Majority (65%) tried to use the other types of treatments instead of pain relievers. Before use the medication, only 48% read the leaflet come along with medication. Results indicated that 67% were aware of side effects of frequent use of pain relievers. As well as results indicated paracetamol was the highly usage pain relievers.

Conclusions: It is prominent to identify more about the awareness of students about mechanism of action, side effects, contraindications, and adverse effects of pain relievers specially paracetamol and to manage usage of pain relievers among students in a healthy manner.

Keywords: *Knowledge, Painkillers, Practice, Students, Usage*

PP 13

Knowledge and Practices of Foot Care among Patients with Diabetes Mellitus in the Asian Countries: A Systematic Review

Dilrukshi K.K.J.^{1#}, De Silva B.S.S.²

¹Health Education Unit, Teaching Hospital, Karapitiya, Sri Lanka

²Department of Nursing, Faculty of Health Sciences, The Open University of Sri Lanka

[#]Corresponding author: janakidilrukshi1975@gmail.com

Background: Diabetes mellitus is the leading cause of non-traumatic amputation worldwide. The major amputation occurs every 20 seconds globally as a result of diabetic foot complications due to poor knowledge and practice of foot care.

Objectives: To critically appraise evidence on the knowledge and practices of foot care among patients with type 2 diabetes mellitus in Asian countries.

Methods: A systematic review was conducted to critically appraise and summarize the data into a single study. Thus, Pub Med, CINAHL and Wiley Online Library were referred using the keywords; type 2 diabetes mellitus, knowledge, practices, foot care and Asian countries. Then 1390 articles were found published from 2015-2021 in English. The PRISMA filtering technique was focused to select the best research. Finally, seven articles were selected considering inclusion and exclusion criteria.

Results: Qualitative thematic analysis was applied, and three key themes emerged from the results. The first key theme is the deficiency of knowledge of foot care leading to diverse complications. Many patients did not have enough knowledge regarding the daily inspection of the foot, checking the temperature of water before washing feet, drying feet after washing. The second theme is that poor practices of diabetic foot care cause amputations. They followed many malpractices such as not trimming toenails straight across, not applying any moisturizer on the foot skin to avoid dryness. The third theme is that footwear avoids injuries. Many malpractices leading to foot injuries were identified relating to footwear such as not checking the inside before wearing shoes, wearing barefoot indoor and outdoor frequently.

Conclusions: The deficiency of knowledge and malpractices of diabetic foot care are influential factors for the development of various foot complications as well as increasing foot amputations. Therefore, health care providers should maintain regular educational programs ensuring knowledge and practice.

Keywords: Diabetic foot, Diabetic foot care, Type 2 diabetes mellitus

PP 14

Awareness and Experience about Government Pharmaceutical Pricing Regulations on Medication Usage of Patients with Chronic Non-communicable Diseases

Prasadi D.G.P.^{1,4#}, Dhanarisi H.K.J.², Fahim A.C.M.^{2,3}, Pathiraja V.M.⁴

¹Department of Pharmacy, Faculty of Allied Health Sciences, University of Peradeniya

²South Asian Toxicology Research Collaboration, Faculty of Medicine, University of Peradeniya

³Department of Pharmacy, Faculty of Allied Health Sciences, University of Peradeniya

⁴Department of Pharmacy, Faculty of Allied Health Sciences, University of Ruhuna

#Corresponding author: pathmilaguruge30@gmail.com

Background: Different number of brand names are promoted for one generic medication with a wide price variation in Sri Lanka. Different countries apply varied pricing policies to ensure price control of medicines. The extraordinary Gazettes were established by Sri Lankan government to regulate the price of medicines in 2016, 2017, 2018 and 2019 which affected on price of selected medicines in Sri Lanka.

Objectives: To assess awareness and experience about government pharmaceutical pricing regulations on medication usage of patients with chronic non-communicable diseases (NCDs).

Methods: The study was a prospective cross-sectional study conducted from November 2019 to February 2020. Data was obtained from 400 patients with chronic NCDs using an interviewer administered questionnaire. The questionnaire was content and face validated using 20 patients. The awareness and experience about government pharmaceutical pricing regulations on medication usage of patients with chronic non-communicable diseases were assessed from patients who attended two pharmacies in Peradeniya and Kandy using convenience sampling method.

Results: Among the 400 patients, 56% were females and median age was 64 years. The most commonly observed NCD was hypertension (56.75%). Of the total sample, 53% were aware about price regulations. Out of the patients who were aware about new pharmaceutical revised pricing policy, 67% of patients were aware about medication price changes as well. Moreover, 86% of patients experienced price increment, 8% experienced a reduction and 6% experienced no change. Substituted medicines were used by patients due to the perception on effectiveness (37.88%), price (18.18%) and unavailability (0.76%). Among the patients who were aware about price regulations, 27% of patients mentioned that it is extremely favorable to Sri Lanka.

Conclusions: Majority of the patients in the selected sample were aware of price regulations of medicines and patient's satisfaction was less regarding regulations.

Keywords: Extraordinary Gazette, Generic, Non-communicable diseases, Pharmaceutical pricing regulation

PP 15

Prevalence of Snake Envenomation History among Patients of Chronic Kidney Disease of Unknown Origin in Wilgamuwa Divisional Secretariat, Matale District, Sri Lanka

Erandika H.G.N.[#], Basnayake B.M.D.B., Nanayakkara N.

Centre for Research, National Hospital, Kandy

[#]*Corresponding author: hgnadunierandika@gmail.com*

Background: Snake envenomation and Acute Kidney Injury (AKI) following snake bite is more common among rural, agricultural workers in resource-poor community settings. Therefore, it is an additional risk factor for the occurrence of CKD in dry zone agricultural areas where the Chronic Kidney Disease of unknown origin (CKDu) is prevailing.

Objectives: To assess the prevalence of snake envenomation history in CKDu diagnosed patients in Wilgamuwa, Sri Lanka.

Methods: This was a cross-sectional study which was carried out among 293 CKDu diagnosed patients in Wilgamuwa Divisional Secretariat, Matale district, Sri Lanka. Random sampling technique was used when selecting participants for the study and an interviewer administered data collection form applied to collect the data from the patients.

Results: Majority of the study participants were male (n=222; 75.8%). The study population ranged from 25 to 65 with the mean age of 53.5±8.3 years. Among that, 28.3% (n=83) patients reported with at least one event of snake envenomation before CKDu disease diagnosed period. An increased risk of snake envenomation is presented among farmers than non-farmers (RR=1.211; CI=0.836-1.754). Most common types of identified envenomation were Russell's viper, Sri Lankan Cobra, Hump Nosed Viper and Common Krait as 32.5%, 13.2%, 6.02% and 16.9%, respectively. However, 31.3% of the patients reported with other types of snake envenomation and unidentified snake attacks.

Conclusion: Prevalence of snake envenomation is significantly high among CKDu patients who are farmers. Hence, it can be accounted as an occupational hazard for CKDu patients, which can indirectly affect their future medical conditions.

Keywords: *Chronic Kidney Disease of unknown origin, Snake envenomation*

PP 16

Assessing the Awareness Regarding the Risk Factors of Cervical Cancer among Women in Gampaha District, Sri Lanka

Devindini P.A.D.O.#, Sameetha F, Amarasena L.B.I.S., Weerakoon N.

School of Nursing, International Institute of Health Sciences, Sri Lanka

#Corresponding author: odevindini@gmail.com

Background: Cervical cancer is a malignant tumour that arises in the uterine cervix, which has been identified as the second leading cause of cancer deaths among women around the world including Sri Lanka. A sexually contagious pathogen, the Human Papillomavirus (HPV), is often accountable as the aetiology. Having multiple sexual encounters, engagement in risky sexual behaviour, including the usage of oral contraceptives and possessing a compromised immune system are considered as risk factors.

Objectives: To assess the awareness regarding the risk factors of cervical cancer among women in the Gampaha district, Sri Lanka.

Methods: A descriptive, cross-sectional study was conducted using a close-ended, self-administered online questionnaire, distributed among 150 women aged between 18-50 years in Gampaha district. A convenience sampling technique was used. Data were analyzed using the Microsoft Excel and the SPSS software version 25.0.

Results: Out of the total, 84% of the participants were aware of cervical cancer, while 16% were not. Majority of the study participants (56%) were aware of the cervical cancer risk factors. Furthermore, among the 56% of the study subjects, 76 % of the women identified unsafe sexual practices as one of the major risk factors. It was also identified that the respondents believed in; quitting smoking (2.7%), avoiding unsafe sexual practices (10.7%), obtaining the HPV vaccination (32.7%) and undergoing Pap smear test (19.3%), as some of the precautions that could greatly reduce the chance of the developing cervical cancer.

Conclusions: Even though, majority of the study subjects were aware of the cervical cancer and their risk factors, the results of this study cannot be generalized to the population due to the small sample size. Therefore, awareness programmes should be conducted in the community to provide further information on the risk factors, disease prognosis and severity, enabling women to take the necessary precautions in the future.

Keywords: *Awareness, Cervical cancer, Risk factors, Sri Lanka, Women*

PP 17

Nurses' Perception towards the Use of Advanced Medical Devices in Critical Care Units

Weerabahu R. [#], Dharmasiri U., Wickramasinghe M., Sirinilame S., Sriyani, K.A.
Department of Nursing, Faculty of Health Sciences, The Open University of Sri Lanka

[#]Corresponding author: ranitha630@gmail.com

Background: Advancements in technology cause traditional medical equipment to become more sophisticated in function and structure. When using these Advanced Medical Devices (AMD) critical care nurses may have both positive and negative perceptions towards patients, nursing care and the nursing profession.

Objectives: To examine nurses' perception towards the use of AMD in critical care units of four hospitals in Ratnapura district.

Methods: A quantitative descriptive cross-sectional study was conducted using critical care nurses (n=225) of intensive care units, coronary care units, neonatal intensive care units and emergency treatment units of four hospitals in Ratnapura district. Data were collected using a previously validated, pre-tested, self-administered questionnaire from voluntarily recruited nurses who were employed in critical care units for ≥ 2 years. Nurses' perception was assessed using a five-point Likert scale ranging from strongly agree to strongly disagree.

Results: The total of 165 nurses with a mean age of 34 years (SD=5.33) participated in the study (response rate-73.3%). Majority of the nurses in the sample were females (90%) and diploma holders (92%). A higher proportion of nurses had not undergone any formal critical care training (77%) or in-service education regarding the use of AMD (75.5%). Nearly all nurses (98.5%) accepted that the use of AMD may provide higher care effectiveness while 79% of the nurses agreed that they may provide higher patient safety through proper recognition of complications using AMD. Most of the nurses accepted that the use of AMD helps them to improve their knowledge and skills and leads to easy completion as well as faster completion of nursing duties. A considerable proportion of nurses thought that improper handling of AMD (66%) and misinterpretation of data (60%) may increase patient risks.

Conclusions: Though critical care nurses' perception towards the use of AMD was found to be desirable, appropriate measures are required to develop the nurses' perception towards a more positive direction and thereby to improve the quality of care provided by them.

Keywords: *Advance medical devices, Critical care nurses, Perception*

PP 18

Formulation of Antioxidants Rich Herbal Cream using Leaf Extract of *Ocimum tenuiflorum* (krishna thulsi) and Evaluation of *In vitro* Antioxidant Activity

Hettihewa S.K.[#], Sankalpana L.P.S.

Department of Pharmacy, Faculty of Allied Health Sciences, University of Ruhuna, Sri Lanka.

[#]Corresponding author: krishnathi2001@yahoo.com

Background: Herbal cosmetics have gained considerable attention comparatively with synthetic cosmetic products. *Ocimum tenuiflorum* is a well-known medicinal plant widely used in Indian traditional medicinal and cosmeceutical preparations.

Objectives: To formulate novel herbal cream using *O. tenuiflorum* leaf extract and evaluate *in vitro* antioxidant activity.

Methods: The crude extract of 70% aqueous acetone was prepared by steeping method and the total phenolic, flavonoid contents of the extract were evaluated by using Folin-Ciocalteu assay and aluminum chloride colorimetric method, respectively. *In vitro* antioxidant activity was determined by 2,2-diphenyl-1-picrylhydrazyl (DPPH) and ferric-reducing antioxidant power activity (FRAP) assay. The herbal creams (F1-F4) were formulated by incorporating the freeze-dried powder of the extract to the cream base and essential oils (Eucalyptus and Lavender) followed by evaluation of *in vitro* antioxidant activity with compared to a commercial product. The physical stability parameters (pH, odour, phase separation, appearance and colour) were also tested at room temperature.

Results: The results of the total phenolic and flavonoid contents for the extract were 1973.8 ± 2.9 mg Gallic acid equivalents (GAE)/ 100 g fresh weight (FW) of leaves and 1879.8 ± 14.2 mg Catechin equivalents (CAE)/ 100 g FW of leaves, respectively. Radical scavenging activity was 10.7 ± 0.1 mmol Trolox equivalents/ 100 g FW of leaves and ferric reducing antioxidant power was 25.3 ± 0.2 mmol Fe(II) equivalents/ 100 g FW of leaves, respectively. There were no remarkable changes in the physical parameters tested during the time observed. Among the different formula tested, F4 was selected as the most stable formula with the highest antioxidant activity measured by DPPH assay (6.8 ± 0.1 mmol Fe(II) equivalents/ 100 g weight of cream) and FRAP assay (3.4 ± 0.1 mmol Fe(II) equivalents/ 100 g weight of cream).

Conclusions: The results revealed that *O. tenuiflorum* leaf extract tested was rich with phenolics and flavonoids which would have contributed to reveal highest antioxidant activity of the F4 cream formulation.

Keywords: Antioxidant activity, DPPH assay, FRAP assay, *Ocimum tenuiflorum*

PP 19

Evaluation of *In vitro* Anti-inflammatory Activity of a Formulation Developed by Rhizome of *Curcuma zedoaria*

Ileperuma K.G.¹, Upeksha S.D.R.¹, De Silva H.P.D.¹, Samanmali B.L.C.¹,
Jayasuriya W.J.A.B.N.², Herath H.M.D.R.^{2#}

¹Department of Pharmacy, Faculty of Allied Health Sciences, General Sir John Kotelawala Defence University, Sri Lanka

²Department of Pharmacy and Pharmaceutical Sciences, Faculty of Allied Health Sciences, University of Sri Jayewardenepura, Sri Lanka

[#]**Corresponding author:** dilanthi.herath@sjp.ac.lk

Background: The rhizome of *Curcuma zedoaria* is used in the Ayurveda system to treat inflammatory conditions.

Objectives: To evaluate *in vitro* anti-inflammatory activity of different fractions of aqueous extract of *C. zedoaria* rhizome and develop an anti-inflammatory cream incorporating *C. zedoaria*.

Methods: The aqueous extract of *C. zedoaria* rhizome was made by boiling 480 g of fresh rhizome in 1920 mL of distilled water until volume reduced up to 1/8. A part of the filtered aqueous extract was freeze dried and the other part of the aqueous extract was subjected to sequential fractionation. The resulted hexane, dichloromethane, ethyl acetate fractions and the remaining aqueous part were evaporated using a rotary vacuum evaporator. The dry products of all the extracts were assessed for their *in vitro* anti-inflammatory activity using egg albumin denaturation assay. Diclofenac sodium was used as the reference drug. A cream was formulated by incorporating the most effective extract to a base selected by stability studies of different bases. The anti-inflammatory activity of the developed cream was compared against the commercially available diclofenac sodium cream.

Results: The aqueous extract of *C. zedoaria* rhizome and its hexane, dichloromethane, ethyl acetate fractions and the remaining aqueous extract showed activity against albumin denaturation assay at a concentration range of 31.25-4000 µg/mL with the IC₅₀ values; 94.45, 3822, 373.2, 337.7 and 565.4 µg/mL, respectively. The IC₅₀ value obtained for the diclofenac sodium was 915.7 µg/mL. The IC₅₀ value obtained by albumin denaturation assay for the formulated cream with 3% (w/w) aqueous extract of *C. zedoaria* rhizome was 1894 µg/mL and for a commercially available diclofenac sodium cream was 1227 µg/mL.

Conclusions: The highest anti-inflammatory activity can be observed in the aqueous extract of *C. zedoaria* rhizome compared to its fractions and was higher than the reference drug. The formulated cream with aqueous extract of *C. zedoaria* rhizome also exhibits *in vitro* anti-inflammatory activity but, further studies are required to improve its drug releasing capacity.

Keywords: Anti-inflammatory, *C. zedoaria*, Egg albumin denaturation assay, *In vitro*, Sequential extraction

PP 20

The Perception and Preference for Online Education among Final Year Undergraduates during Covid-19 Pandemic in Selected State Universities in Western Province, Sri Lanka

Upeksha S.H.D.[#], Gamage M.A.M.N.

*Department of Nursing and Midwifery, Faculty of Allied Health Sciences,
University of Sri Jayewardenepura, Sri Lanka*

[#]Corresponding author: dushaniupeksha96@gmail.com

Background: The educational institutes across the world have closed due to the Covid-19 pandemic jeopardizing the academic schedules. Most of educational institutes have shifted to online learning platforms to continue academic activities.

Objectives: To describe the perception and preference for online education and to identify failures and benefits of online learning experienced by final year undergraduates during Covid-19 pandemic in selected state universities in western province, Sri Lanka.

Methods: A descriptive cross-sectional study was conducted. Final year students in all faculties from the University of Sri Jayewardenepura, University of Colombo, University of Kelaniya, University of Moratuwa, and University of Visual & Performing Arts were selected. Data collection was carried out through an online survey using a structured self-administered questionnaire with close ended questions. SPSS software version 26.0 was used to analyze data using descriptive statistics and Chi-square test.

Results: Among 535 undergraduates, 69.7% were females. Significant number of respondents (91.2%) have used online learning for the first-time during lockdown. Majority of the respondents (83.9%) has used smart phones for attending sessions and 75.1% said that using WhatsApp was the best way to communicate class updates. Most of the respondents (60.7%) said they preferred to use a mobile data pack as the source of the internet. Majority of respondents (51.4%) had good perception towards online learning. Students in the University of Visual and Performing Arts (75%), University of Kelaniya (69.2%), and University of Moratuwa (56.7%) have a good perception towards online learning. Students at the University of Sri Jayewardenepura (63.4%) and University of Colombo (51.4%) have poor perceptions towards online learning. The present study found that there is a significant relationship between University and students' perception on online learning ($p < 0.05$). Results of the study indicate that more comfortable environment (80.1%) was ranked as the major benefit. Data speed (75.8%) was identified as the main bottleneck factor in online learning. The student readiness (84.6%) was the major determinant for smooth conduct of online classes. Many participants (78.1%) in this research study reported that technological constraints were the main challenge in their online learning experience.

Conclusions: Majority of the students evinced a positive attitude towards online classes in the wake of Covid-19. The online learning was found to be advantageous as it provided more comfortable environment for the learners. Students preferred to use smart phones for attending sessions, which clearly suggests that if any organization which wants to develop an application for the online learning, it has to ensure that the platform is compatible with smartphones. The findings highlighted that Sri Lanka wants to move towards online education and internet facilities as a pre-requisite. The online classes will succeed only if all the students have access to internet.

Keywords: Covid-19, Online education, Perception, Preference

PP 21

The Correlation between Falls Incidence and Quadriceps Muscle Strength of Patients with COPD Presented to National Hospital for Respiratory Diseases, Welisara and Chest Clinic at Medical Research Institute Sri Lanka

Gordon L.A., Sandali Malsri D.G., Wijesiriwardana V.R., Perera G.A.D. #

Faculty of Allied Health Sciences, General Sir John Kotelawala Defence University, Sri Lanka

#Corresponding author: amaradamayanthi@gmail.com

Background: Skeletal muscle dysfunction is observed in some patients with chronic obstructive pulmonary diseases (COPD). Quadriceps muscle strength plays an important role in maintaining the postural stability.

Objectives: To recognize the falls incidence and identify the probability of risk of falls among out-patients suffering from COPD in relation to their quadriceps muscle strength.

Methods: This descriptive cross-sectional study was conducted with 35 COPD patients aged 40-60 years, who were attended to the respiratory clinics within the 3rd month of the year 2021. The sample was collected according to the convenience sampling method. Quadriceps strength of bilateral lower limbs were measured using the one-repetition maximum (1RM) strength test and the data of falls incidence were collected using the interviewer administered questionnaires. Spearman's correlation coefficient test was used to measure the correlation between falls incidence and quadriceps muscle strength.

Results: There were 27 male and 8 female patients participated in this study. The test results indicated a significant positive correlation between falls incidence and right side 1RM ($p=0.019$, $r=0.395$) and left side 1RM ($p=0.033$, $r=0.362$). The logistic regression test was used to measure the probability of risk of fall in relation to quadriceps muscle strength and the results showed a significant positive relationship between probability of risk of falls and right side 1RM ($p=0.030$, $r=0.601$) and left side 1RM ($p=0.040$, $r=0.537$).

Conclusions: According to the results of the study, a significantly positive correlation between falls incidence and quadriceps muscle strength of COPD patients was identified.

Keywords: COPD, Falls incidence, Quadriceps muscle strength, Risk of falls, 1RM strength test.

PP 22

Prevalence of Antimicrobial Resistance among *Staphylococcus aureus* Isolates from Clinical Samples in Teaching Hospital Mahamodara

Sufna M.S.F.^{1#}, Weerasinghe N.P.²

¹Department of Medical Laboratory Science, Faculty of Allied Health Sciences,
University of Ruhuna, Sri Lanka

²Department of Microbiology, Faculty of Medicine, University of Ruhuna, Sri Lanka

[#] Corresponding author: sufnasuhail820@gmail.com

Background: Antimicrobial resistance in *Staphylococcus aureus* causing human infections is associated with high morbidity and mortality.

Objectives: To describe the prevalence of antimicrobial resistance among *S. aureus* isolated from clinical samples at Teaching Hospital Mahamodara (THM).

Methods: A descriptive cross-sectional study was conducted at THM. Antibiotic sensitivity patterns of 383 isolates of *S. aureus* were tested using standard disc diffusion method recommended by the Clinical and Laboratory Standards Institute (CLSI). Sensitivity tests were performed in duplicate on 33 isolates, collected prospectively over a period of two months from January to March 2021. Mean diameters were recorded. Names of patients were noted to avoid repetition of the same sample from the same patient. Data on remaining 350 isolates were obtained retrospectively from most recent laboratory records. Results were interpreted according to the CLSI 2009 criteria. Prevalence of antimicrobial resistance to different antibiotics were expressed in percentages. Statistical analysis was carried out using z-test at $p < 0.05$ level of significance.

Results: Out of 383 isolates of *S. aureus*, majority (n=356) were from swabs; 210 (59.8%) high vaginal swabs (HVS), 72 (20.5%) eye swabs, 53 (15.1%) wound swabs and the remaining were from other sites. Only 7% (n=27) were from blood, urine and pus. Methicillin-resistant *S. aureus* (MRSA) constituted 47.8% (n=183) of the total isolates. The highest percentage (44.8%) of MRSA were isolated from HVS. Methicillin sensitive *S. aureus* (MSSA) resistance rates to erythromycin, clindamycin, gentamicin and co-trimoxazole were 50.8%, 10.7%, 15.0% and 1.7%, respectively, while MRSA showed resistance rates of 65.6%, 27.4%, 12.5% and 2.2% to same antibiotics. Significant resistance to erythromycin ($p=0.004$) and clindamycin ($p < 0.001$) were observed in MRSA.

Conclusions: Prevalence of MRSA at THM is comparable to that of other tertiary care hospitals in Sri Lanka. MRSA strains are more likely to be resistant to erythromycin and clindamycin than MSSA.

Keywords: Antimicrobial resistance, MRSA, MSSA, *Staphylococcus aureus*

PP 23

Effects of the Presence of Pus Cells in Seminal Fluid Samples on Sperm Motility and Morphology in a Group of Males who attended to Subfertility Clinics in Galle District

Kadahetti K.P.^{1#}, Rodrigo M.², Fernando H.H.L.K.³

¹*Department of Medical Laboratory Science, Faculty of Allied Health Sciences, University of Ruhuna, Sri Lanka*

²*Department of Anatomy, Faculty of Medicine, University of Ruhuna, Sri Lanka*

³*Department of Pre Clinical Sciences, Faculty of Medicine, General Sir John Kotelawala Defence University, Sri Lanka*

[#] *Corresponding author: 4kaveeshakadahetti@gmail.com*

Background: The quality of seminal fluid is one of the main determinants of male fertility. The quality of seminal fluid is determined by several parameters, such as volume, sperm concentration, percentage of normal morphology, motility, viability, progressivity etc.

Objectives: To assess the effects of the presence of pus cells in seminal fluid samples on normal morphology and motility.

Methods: A quasi-experimental study was conducted among sample of 107 men who attended for subfertility clinics in Galle district. Convenience sampling method was used. After obtained the informed consent, semen samples were collected. Pus cell count, sperm motility and normal morphology were evaluated based on the WHO guidelines (2010). Data were analyzed using independent sample t-test in SPSS software version 20.0. Level of significance was considered as 0.05.

Results: Majority of samples had pus cell count less than 5 (n=75, 70.1%). Only 32 (29.9%) had pus cell count 5 or above. Out of 75 samples with pus cell count <5, 32 samples (42.7%) had percentage normal morphology more than 30% while only 3 samples (9.4%) with pus cell count ≥5 had percentage normal morphology more than 30%. The mean and standard deviation (±SD) of normal morphology were 26.88 and 8.69 for samples with pus cell count <5 while 21.39 and 6.99 for samples with pus cell count ≥5. The finding was highly significant ($p=0.002$). Thirty two (42.7%) out of 75 samples with pus cells <5 had normal motility (≥50%). However, only 6 (19%) of 32 samples with pus cells ≥5 had normal motility (≥50%). The mean and standard deviation (SD) of normal motility were 46.59 and 10.95 for samples with pus cell count <5 while 41.25 and 10.37 for samples with pus cell count ≥5. The finding was highly significant ($p=0.021$).

Conclusions: A highly significant correlation was observed between the presence of pus cells more than 5 in seminal fluid samples and percentages of normal morphology and motility. The results of this study showed that pus cell count showed an inverse relationship with normal morphology and motility of sperms.

Keywords: *Morphology, Motility, Pus cells, Sperm*

PP 24

Does Sri Lanka Need to Reshape the Education for Substance Use Prevention in Schools?

Jayamaha A.R.¹, Dharmarathna H.H.N.D.^{1#}, Ranadeva N.D.K.², Nawarathne L.C.³,
Herath H.M.N.D.M.³, Buddhini D.G.H.², Samarakoon D.N.A.W.²,
Arachchi A.M.P.S.², Senerath S.N.¹, Darshana A.T.⁴, Samarasinghe K.L.¹
Senanayake B.⁴, Welagedara L.⁴, Fernando S.S.N.⁵

¹Faculty of Nursing, Kaatsu International University, Sri Lanka

²Faculty of Health Sciences, Kaatsu International University, Sri Lanka

³Higher Education Institute Society-Linkage Cell, Kaatsu International University, Sri Lanka

⁴National Dangerous Drugs Control Board, Sri Lanka

⁵Faculty of Medical Sciences, University of Sri Jayewardenepura, Sri Lanka

#Corresponding author: nishadi@kiu.ac.lk

Background: The age of instigating substance use has decreased globally and school children have become more vulnerable. This is attributed to the scantiness of knowledge regarding substance use and, its' consequences. School-based education for substance use prevention is appropriate and a convenient platform to access the vulnerable adolescence. Further, it will be instrumental in empowering school children against substance use.

Objectives: To assess the influence of school education on substance use among the residential rehabilitees.

Methods: A descriptive cross-sectional study was conducted among 113 individuals with substance use disorder who are enrolled in government and non-governmental residential drug rehabilitation programmes. Participants were enrolled in the study using consecutive sampling. Data such as demographics, drug use, factors associated with drug use, were collected using an interviewer-administered questionnaire. Data were analysed using descriptive statistics due to the descriptive nature of the study.

Results: Majority (97%) of the participants were males with the mean age of 27±6 years. All the participants were poly drug users with a mean duration of substance use of 7±5 years. Of the participants, 80% attended government schools and 51% educated up to ordinary levels, 28% up to advanced levels and 10% were graduates. Most (62%) of the participants did learn about substance use and its consequences at school and 89% attended Sunday/Dhamma (religious) school. The mean age of instigating substance use was 17±4 years.

Conclusions: Regardless of providing awareness regarding the substance use and its' consequences at schools and Sunday/Dhamma school, individuals instigating substance use at school age. This reveals the need of reshaping the school-based education for substance use prevention by both formal and informal health curricula.

Keywords: Education, Sri Lanka, Substance addiction, Young adults

Acknowledgement: Accelerating Higher Education Expansion and Development (AHEAD) Operation of the Ministry of Higher Education funded by the World Bank (HEI DOR (R2) No.06).

PP 25

Evaluation of Cytotoxic Effects in Aqueous Herbal Extracts Obtained from *Psidium guajava*, *Garcinia quaesita* and *Cinnamomum verum* Using Brine Shrimp Assay

Wijenayka D.^{1#}, Bulugahapitiya V.², Jayasinghe S.¹

¹Department of Pharmacology, Faculty of Medicine, University of Ruhuna

²Department of Chemistry, Faculty of Science, University of Ruhuna

[#]Corresponding author: dilminiwijenayakal@gmail.com

Background: World Health Organization indicates that 70-80% of the world's population rely on plant based traditional medicine but their toxicological properties have not been explored adequately. Brine shrimp lethality assay is used in preliminary assessment of toxicity. Clarkson's toxicity criterion classifies plant extracts with $LC_{50} \geq 1000$ ppm; non-toxic, LC_{50} 500–1000 ppm; low toxic, LC_{50} 100-500 ppm; medium-toxic, and extracts with $LC_{50} \leq 100$ ppm are very toxic. Leaves of *Psidium guajava* (Guava), *Garcinia quaesita* (Garcinia) and barks of *Cinnamomum verum* (Cinnamon) are selected as those plant extracts are known to have anti-diabetic properties and can be incorporated into functional food and nutraceuticals.

Objectives: To evaluate cytotoxicity of leaves of *Psidium guajava* (Guava), *Garcinia quaesita* (Garcinia) and barks of *Cinnamomum verum* (Cinnamon) using Brine shrimp assay.

Methods: Aqueous extracts of guava and garcinia leaves and cinnamon-barks were freeze-dried. Serial dilution of garcinia, cinnamon (10, 100, 250, 500, 750, and 1000 ppm) were prepared. In addition, dilutions of guava were prepared up to 5000 ppm with 1000 intervals. Brine shrimps were hatched in artificial sea water with dry *Artemia salina* cysts. After incubation, the nauplii were separated into petri-dishes with 4 mL of artificial seawater. Dimethyl sulfoxide (DMSO) and artificial sea water were used as positive and negative control, respectively. LC_{50} were calculated with the number of dead nauplii at 24-hours using probit regression analysis with SPSS software.

Results: None of the brine shrimp nauplii died with guava up to 1000 ppm. Average of 28.5 nauplii died from 2000 to 5000 ppm. The numbers of dead nauplii in ascending order of 10, 100, 250, 500, 750, and 1000 ppm garcinia concentrations were 22, 26, 30, 28, 30 and 30, respectively. In cinnamon, it was 03, 04, 09, 09, 12 and 16, respectively. All the nauplii died in the positive control and all nauplii alive in the negative control. LC_{50} of leaves of guava, garcinia and barks of cinnamon were 1660, 2.2, and 1642 ppm, respectively.

Conclusions: This study reveals that aqueous extracts of guava-leaves and cinnamon-bark are non-toxic, whereas garcinia-leaves demonstrated toxicity in brine shrimp assay.

Keywords: *Artemia*, *Cinnamomum*, *Garcinia*, Lethal Dose 50, Toxicity tests

Acknowledgement: Accelerating Higher Education Expansion and Development (AHEAD) Operation of the Ministry of Higher Education funded by the World Bank DOR05 grant for funding.

PP 26

Prevalence of Risk Factors of Osteoporosis among a Group of Middle-aged Premenopausal Women in Sri Lanka

Subasinghe H.W.A.S.^{1#}, Lekamwasam S.², Ball P.³, Morrissey H.³, Waidyaratne E.I.⁴

¹Department of Pharmacy, Faculty of Allied Health Sciences, University of Ruhuna

²Department of Medicine, Faculty of Medicine, University of Ruhuna

³School of Pharmacy, University of Wolverhampton, United Kingdom

⁴Department of Anatomy, Faculty of Medicine, University of Ruhuna

#Corresponding author: sewwandi_subasinghe@yahoo.com

Background: Osteoporosis has a multitude of risk factors and many of those begin in the middle age. Early recognition and management of risk factors in the middle age helps prevention of osteoporosis in old age.

Objectives: To assess the prevalence of osteoporosis risk factors among a group of premenopausal women in Sri Lanka.

Methods: This cross-sectional study included 323 community-dwelling premenopausal women aged 20-40 years. Sociodemographic data and the prevalence of risk factors of osteoporosis were assessed using an interviewer administered questionnaire. Previous history of fracture, parental history of fragility fracture, prolonged systemic glucocorticoid use (>3 months), smoking and alcohol use, rheumatoid arthritis, chronic disease conditions, parity and duration of breast feeding, exposure to sunlight, calcium and vitamin D rich food intake were evaluated as main risk factors. Anthropometric measurements were made following standard procedures.

Results: Mean±SD age and body weight of the study sample were 31±6 years and 54.5±12.0 kg, respectively. Among the participants, 27.6% were overweight (BMI ≥25 kg/m²) and 20.1% had lower BMI (<18.5 kg/m²). Approximately 13.7% had a family history of hip or major osteoporotic fractures. Prevalence of non-communicable diseases (diabetes, hypertension, asthma, hypercholesterolemia) was very low (6%). None were current smokers or alcohol users or on prolonged glucocorticoid therapy. About 3.7% women did not consume any dairy product while one third of the sample had very low dairy and non-dairy calcium rich food consumption. Median (IQR) duration of total breastfeeding was 48 (24-48) months. Among the breastfed women, 70% had very longer durations of breast feeding (>24months). Daily exposure to sunlight was <2 hours in 55.7% of women.

Conclusions: Less exposure to sunlight, low intake of calcium rich foods, long-term breast feeding and underweight are the potentially modifiable risk factors of osteoporosis prevalent among middle aged premenopausal women. Lifestyle modifications are the best option to reduce them.

Keywords: Osteoporosis, Risk factors, Women

PP 27

Association between Attitudes on Food Advertisements, Eating Behaviour and BMI among Adolescent Boys in a Selected School in ColomboGimhan J.S.^{1#}, Fonseka G.O.M.S.¹, Gooneratne K.M.A.¹, Seneviratne S.N.²¹*Faculty of Medicine, University of Colombo, Sri Lanka*²*Department of Paediatrics, Faculty of Medicine, University of Colombo, Sri Lanka**#Corresponding author: gimhanjs20@gmail.com*

Background: Obesity is a common problem in childhood and adolescence. Eating behaviour is an important determinant of obesity. Therefore, it was hypothesized that there should be an association between attitudes towards food advertisements, eating behaviour and Body Mass Index (BMI).

Objectives: To determine attitudes towards food and beverage advertisements, eating behaviour and their association with BMI among adolescent school boys in Colombo.

Methods: A school based cross-sectional study was conducted on adolescent boys (15-16 years, n=120) from a selected boys' school in Colombo district using cluster sampling method. Self-administered 'Adolescent Food Habit Checklist' and 5-point Likert scale (developed by the researchers) were used to assess data on eating behaviour and attitudes towards food and beverage advertisements respectively. The BMI was calculated to assess the nutritional status. Bivariate Pearson correlation coefficient test was used to determine the associations.

Results: From the participants 59% were from urban areas and 64.2% had a monthly income more than 50000 LKR. Regarding the BMI 64.2% had a normal BMI. The underweight, overweight and obese percentage was 20.0%, 11.7% and 4.2%, respectively. Majority of the participants (85.6%) had a good consumption of fruit and vegetables but also had a high consumption of fried food (75.6%). Attitudes regarding advertisements were largely influenced by the appearance of professionals such as doctors or nutritionists and use of comic visuals and catchy melodies. There was a negative correlation between attitudes and eating behaviour ($r=-0.341$, $p=0.020$) and there was no statistically significant association between eating behaviour and BMI ($r=0.044$, $p=0.768$).

Conclusions: Unfavorable attitudes toward advertisements regarding food and beverages had a moderate degree correlation with the unhealthy eating behaviours. Therefore, it is necessary to regulate the advertisements regarding food and beverages while applying measures to authenticate the information given in the advertisements. However, there was no statistically significant correlation between eating behavior and BMI.

Keywords: Adolescent, Advertisements, BMI, Eating behaviour

List of Reviewers

1. Snr. Prof. Sujeewa Amarasena, Department of Pediatrics, Faculty of Medicine, University of Ruhuna
2. Snr. Prof. L.K.S. Lekamwasam, Department of Medicine, Faculty of Medicine, University of Ruhuna
3. Snr Prof. S. Gunawardhana, Department of Physiology, Faculty of Medicine, University of Ruhuna
4. Snr. Prof. L.K.B. Mudduwa, Department of Pathology, Faculty of Medicine, University of Ruhuna
5. Snr. Prof. K.D. Mahinda, Department of Physiology, Faculty of Medicine, University of Ruhuna
6. Prof. K.A.P.W. Jayatilake, Department of Biochemistry, Faculty of Medicine, University of Ruhuna
7. Prof. M. Hettiarachchi, Nuclear Medicine Unit, Faculty of Medicine, University of Ruhuna
8. Prof. S. Agampodi, Department of Community Medicine, Faculty of Medicine and Allied Health Sciences, Rajarata University of Sri Lanka
9. Prof. V. Bulugahapitiya, Department of Chemistry, Faculty of Sciences, University of Ruhuna
10. Prof. R Chandrajith, Department of Geology, Faculty of Science, University of Peradeniya
11. Prof. S. Gunawardana, Department of Community Medicine, Faculty of Medical Sciences, University of Sri Jayewardenepura
12. Prof. H.M.M. Herath, Department of Medicine, Faculty of Medicine, University of Ruhuna
13. Prof. C. Hewage, Department of Psychiatry, Faculty of Medicine, University of Ruhuna
14. Prof. R.P. Hewawasam, Department of Biochemistry, Faculty of Medicine, University of Ruhuna
15. Prof. L. Jayasekara, Department of Mathematics, Faculty of Science, University of Ruhuna
16. Prof. S.S. Jayasinghe, Department of Pharmacology, Faculty of Medicine, University of Ruhuna
17. Prof. I. Kotapola, Department of Nursing, Faculty of Allied Health Sciences, University of Ruhuna
18. Prof. R.S.J. Lenora, Department of Physiology, Faculty of Medicine, University of Ruhuna
19. Prof. B. Perera, Department of Community Medicine, Faculty of Medicine, University of Ruhuna
20. Prof. M.B. Samarawickrama, Department of Anatomy, Faculty of Medicine, University of Ruhuna
21. Prof. P.V. De Silva, Department of Community Medicine, Faculty of Medicine, University of Ruhuna
22. Prof. M. de Silva, Department of Zoology, Faculty of Science, University of Ruhuna

23. Prof. K.G. Somasiri, Department of Physiology, Faculty of Medicine, University of Ruhuna
24. Prof. D.I. Uluwaduge, Department of Basic Sciences, Faculty of Allied Health Sciences, University of Sri Jayewardenepura
25. Prof. S.S.P. Warnakulasuriya, Department of Clinical Nursing, Faculty of Nursing, University of Colombo
26. Dr. L.W.G.R. Alwis, Department of Anatomy, Faculty of Medicine, University of Ruhuna
27. Dr. K.A.C. Wickramaratne, Department of Pathology, Faculty of Medicine, University of Ruhuna
28. Dr. I.D. Siriwardhana, Department of Biochemistry, Faculty of Medicine, University of Moratuwa
29. Dr. E.I. Waidyarathna, Department of Anatomy, Faculty of Medicine, University of Ruhuna
30. Dr. G.B. Wijerathna, Department of Microbiology, Faculty of Medicine, University of Ruhuna
31. Dr. C. Senadheera, Department of Psychiatry, Faculty of Medicine, University of Ruhuna
32. Dr. A.A.T.D. Amarasekara, Department of Nursing and Midwifery, Faculty of Allied Health Sciences, University of Sri Jayewardenepura
33. Dr. A.P. Attanayake, Department of Biochemistry, Faculty of Medicine, University of Ruhuna
34. Dr. M.T. Napagoda, Department of Biochemistry, Faculty of Medicine, University of Ruhuna
35. Dr. W.V.R.T.D.G. Bandara, Department of Medical Laboratory Science, Faculty of Allied Health Sciences, University of Ruhuna
36. Dr. A.S. Dissanayake, Department of Pharmacy, Faculty of Allied Health Sciences, University of Ruhuna
37. Dr. L.W. Dassanayake, Department of Obstetrics and Gynecology, Faculty of Medicine, University of Ruhuna
38. Dr. S.K. Hettihewa, Department of Pharmacy, Faculty of Allied Health Sciences, University of Ruhuna
39. Dr. A. Karunanayake, Department of Physiology, Faculty of Medicine, University of Ruhuna
40. Dr. K.B. Gunawardena, Department of Medical Laboratory Science, Faculty of Allied Health Sciences, University of Ruhuna
41. Dr. H.H. Peiris, Department of Medical Laboratory Science, Faculty of Allied Health Sciences, University of Ruhuna
42. Dr. T.T. Ponnampereuma, Department of Community Medicine, Faculty of Medicine, University of Ruhuna
43. Dr. G.D. Punchihewa, Department of Psychiatry, Faculty of Medicine, University of Ruhuna
44. Dr. M.K.D.L. Meegoda, Department of Nursing and Midwifery, Faculty of Allied Health Sciences, University of Sri Jayewardenepura
45. Dr. W.N. Priyanthi, Department of Nursing, Faculty of Health Care Sciences, Open

University of Sri Lanka

46. Dr. H.W.A.S. Subasinghe, Department of Pharmacy, Faculty of Allied Health Sciences, University of Ruhuna
47. Dr. N.P. Weerasinghe, Department of Microbiology, Faculty of Medicine, University of Ruhuna
48. Dr. S. Wickramasinghe, Department of Microbiology, Faculty of Medicine, University of Ruhuna
49. Dr. D. Dassanayake, Department of Nursing, Faculty of Allied Health Sciences, University of Peradeniya
50. Dr. S. Rathnayake, Department of Nursing, Faculty of Allied Health Sciences, University of Peradeniya
51. Dr. B.I. Wickramarachchi, Department of Nursing, Faculty of Allied Health Sciences, University of Ruhuna
52. Ms. K.A.K.D. Wijesekera, Department of Pharmacy, Faculty of Allied Health Sciences, University of Ruhuna
53. Ms. S.M.E.B. Weeratunga, Department of Nursing, Faculty of Allied Health Sciences, University of Ruhuna
54. Ms. K.K.P.M.K. De Silva, Department of Nursing, Faculty of Allied Health Sciences, University of Ruhuna
55. Ms. M.W.K. Gamage, Department of Nursing, Faculty of Allied Health Sciences, University of Ruhuna
56. Ms. H.J.H. Madhushanthi, Department of Nursing, Faculty of Allied Health Sciences, University of Ruhuna
57. Dr. S.M.T.D. Sundarapperuma, Department of Nursing, Faculty of Allied Health Sciences, University of Ruhuna
58. Dr. R.H.M.P.N. Rathnayake, Department of Nursing, Faculty of Allied Health Sciences, University of Ruhuna
59. Dr. J.C. De Silva, Department of Community Medicine, Faculty of Medicine, University of Ruhuna
60. Ms. G.A.M. Prasadi, Department of Pharmacy, Faculty of Allied Health Sciences, University of Ruhuna
61. Ms. V.M. Pathiraja, Department of Pharmacy, Faculty of Allied Health Sciences, University of Ruhuna
62. Dr. W.B.N.T. Fernando, Department of Medical Laboratory Science, Faculty of Allied Health Sciences, University of Ruhuna
63. Ms. P. Munidasa, Department of Nursing, Faculty of Health Sciences, The Open University of Sri Lanka
64. Dr. K.H.D. Mahesh, Consultant Psychiatrist, General Hospital, Matara
65. Dr. M.F.M. Rameez, Department of Obstetrics & Gynecology, Faculty of Medicine, University of Ruhuna
66. Dr. S. Hapuarachchi, Department of Ayurveda, Institute of Indigenous Medicine, University of Colombo
67. Mr. M.A. Siriwardana, Department of Pharmacy and Pharmaceutical Sciences, Faculty of Allied Health Sciences, University of Sri Jayewardenepura

68. Dr. A.M.S. D. Pathirana, Department of Nursing, Faculty of Allied Health Sciences, University of Peradeniya
69. Dr. A.C.M Fahim, Department of Pharmacy, Faculty of Allied Health Sciences, University of Peradeniya
70. Dr. T. Weliwitiya, Consultant Transfusion Physician, Blood Bank, Teaching Hospital, Karapitiya
71. Dr. H.M.D.R. Herath, Department of Pharmacy & Pharmaceutical Sciences, Faculty of Allied Health Sciences, University of Sri Jayewardenepura
72. Dr. R.H.S.K. De Silva, Department of Ayurveda, Institute of Indigenous Medicine, University of Colombo
73. Dr. K.I.W.K. Somarathna, Department of Nidana Chikitsa, Institute of Indigenous Medicine, University of Colombo
74. Dr. M.W.S.J. Kumari, Department of Moulika Siddantha, Institute of Indigenous Medicine, University of Colombo
75. Dr. P.K. Perera, Department of Dravyaguna Vignana, Institute of Indigenous Medicine, University of Colombo
76. Ms. S.M.K.S. Seneviratne, Department of Nursing and Midwifery, Faculty of Allied Health Sciences, University of Sri Jayewardenepura
77. Dr. T. Asurakkodi, Department of Fundamental Nursing, Faculty of Nursing, University of Colombo
78. Dr. T. Wijesiri, Department of Pathology, Faculty of Medicine, University of Ruhuna
79. Dr. I.M.P.S. Ilankoon, Department of Nursing and Midwifery, Faculty of Allied Health Sciences, University of Sri Jayewardenepura
80. Dr. M. Rodrigo, Department of Anatomy, Faculty of Medicine, University of Ruhuna
81. Dr. K.A. Sriyani, Department of Nursing, Faculty of Health Sciences, The Open University of Sri Lanka
82. Dr. N. Hettiarachchi, Department of Mechanical & Manufacturing Engineering, Faculty of Engineering, University of Ruhuna
83. Dr. M. Dasanayake, Department of Mechanical & Manufacturing Engineering, Faculty of Engineering, University of Ruhuna
84. Dr. S.G. Senadheera, Department of Pharmacy and Pharmaceutical Sciences, Faculty of Allied Health Sciences, University of Sri Jayewardenepura
85. Dr. P. Perera, Department of Pharmacy, Faculty of Allied Health Sciences, University of Peradeniya
86. Dr. S. Mendis, Teaching Hospital, Karapitiya
87. Dr. C. Mohotti, General Hospital, Badulla
88. Dr. A. Dharmapala, Department of Surgery, Faculty of Medicine, University of Peradeniya

Organizing committee greatly appreciate the financial assistance provided by the following entities for the success of RuFARS-2021

Main Sponsors:

**Academic staff members of the Faculty of Allied Health Science,
University of Ruhuna**



DISCOVERING NEW DIMENSIONS IN INNOVATION



60

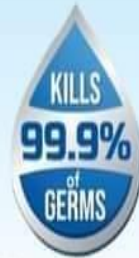
YEARS OF EMPOWERING
THE NATION

පැය 4කට වඩා ක්‍රියාකාරී වන, උසස්ම ප්‍රමිතියේ අමු ද්‍රව්‍ය යොදා නිපදවන,
රටවල් 10ත් වඩා අපනයනය කරන
ඖෂධ නියාමන අධිකාරියේ (NMRA) අනුමැතිය ලත්

ශ්‍රී ලංකාවේ එකම Hand Sanitizer නාමය



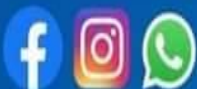
ZeroTM



- NMRA Approved
- US FDA Approved Advanced formula
- 80% Alcohol USP
- Comply with EN 1500 Standards
- Export Quality

නිවසටම ගෙන්වා ගැනීම
සඳහා අමතන්න

☎ 0706262930



www.universal-lifeline.com



ROTAK INSTRUMENTS (PVT) LTD



FOR:-

- **Analytical Instruments**

AAS / ICP / ICPMS / XRD / XRF / UV-VIS / HPLC / Ion Chromatograph / DSC
Thermal Analyzer / GC/ GCMC / TOC & TN Analyzer / Elemental Analyzers
Mercury Analyzer / AOX & TOX Analyzer / Antioxidant Analyzer / On-line Analyzers
Continuous Flow Analyzer / Particle Size Analyzer / Electron Microscope

- **Laboratory & Scientific Equipment**

- **Laboratory Glassware / Consumables**

- **Laboratory Chemicals**

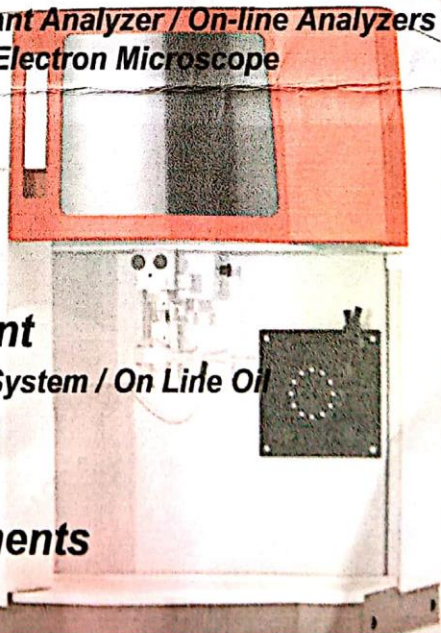
- **Electrical Condition Monitoring Equipment**

Dissolved Gas Analyzer / Partial Discharge Monitoring System / On Line Oil
Filtering Plant

- **Engineering & Agricultural Equipment**

- **Repairs & Servicing of Analytical Instruments**

Laboratory & Scientific Equipment



No.38, Sri Dewananda Mawatha, Piliyandala

Tel.: 011 2618872 / 2609592 / Fax: 011 2618872 / Hot Line: 0719 106106

Email: info@rotak.lk | sales@rotak.lk | service@rotak.lk

With Best Compliments from ,



Dedicated to Microbiology



High Quality Viscometer, Rheometer, Texture analyzer & Powder flow tester



memmert
Experts in Thermostatics

Innovation leader in the development of heating ovens, incubators, climate chambers as well as waterbaths and oilbaths



High-performance scientific instruments and analytical and diagnostic solutions to explore life and materials at molecular level.

RANKEM
Total Scientific Laboratory Solutions Provider

avantor

Reagents & Chemicals manufactured in India



Chemicals and laboratory scientific supplies



Leading Solution Provider for Rotary evaporators, Kjeldahl, Flash chromatography & Extraction System

Waters

THE SCIENCE OF WHAT'S POSSIBLE.™

Leading supplier for
HPLC, UPLC, LCMS &
LCMSMS



sartorius

Bioprocess solution & Laboratory products
(Balance, water purification system,
microbiology, Liquid Handling & filters)

"One stop shop" for your total laboratory & medical needs for over 65 years.

Hemsons International (Private) Ltd

Hemas Building
34 -2/1, Sir Razeek Fareed
Mawatha Colombo 01
00100

Gen : 011 2327948
Fax : 011 2466054
Web : www.hemsons.lk
Email : hemaslab@slt.lk



