

14TH INTERNATIONAL RESEARCH CONFERENCE

“ Security, Stability and National Development in the New Normal ”

09TH - 10TH SEPTEMBER 2021

ALLIED HEALTH SCIENCES

ABSTRACTS





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**SECURITY, STABILITY AND NATIONAL DEVELOPMENT
IN THE NEW NORMAL**

ALLIED HEALTH SCIENCES

ABSTRACTS



**General Sir John Kotelawala Defence University
Ratmalana, Sri Lanka**

This book contains the abstracts of papers presented at the Allied Health Sciences Sessions of the 14th International Research Conference of General Sir John Kotelawala Defence University, Ratmalana, Sri Lanka held on 9th and 10th of September 2021. No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form, without prior permission of General Sir John Kotelawala Defence University, Ratmalana, Sri Lanka.

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Message from the Chief Guest



It is with great pleasure that I send this message to the publication of selected conference papers, under a theme that seems more relevant today than ever.

Throughout the history, security has always been the central notion of our existence as a nation. It will continue to be, as long as the geographical realities that define the country's location remains so. This centrality causes our development paradigm to always have a nexus with security, undeniably linking itself to the overall stability of the country.

As the world was compelled to enter into a 'new normal' with the COVID-19 pandemic, the traditional focus on maintaining the hard component of security was overshadowed by the need to replenish its soft component. The world has recently witnessed struggles of global powers with the highest military might, to maintain and uphold their health security. The less-talked about soft security has emerged to overshadow its counterpart, calling us to re-think and re-define the security-development nexus.

COVID-19 posed an unprecedented challenge to Sri Lanka and all developing economies, calling those States to experiment with new ways for achieving national development while managing the novel challenges to their security and stability. In this backdrop, I am delighted to see that the KDU has made allowance for this paradigm shift and hosted its International Research Conference - 2021 along the theme, 'Security, Stability and National development in the New Normal'.

I congratulate all scholars who have contributed to the conference, in particular, those who have shared their research and findings. My heartiest appreciation goes to the Vice Chancellor, Faculty and the staff of KDU whose undying commitment has made this event a reality, even during the pandemic situation.

Steering a country forward in turbulent times is a task that needs meticulous inputs from the country's intellectual body. I am certain that the KDU Research Conference - 2021 has made its mark in this endeavour.

Mr Lalith Weeratunga

Principal Advisor to His Excellency the President of Sri Lanka

Message from the Secretary, Ministry of Defence



It gives me immense pleasure to forward this message on the occasion of the 14th International Research Conference of the General Sir John Kotelawala Defence University (KDU). At the outset, I must appreciate the leadership and guidance which the Vice Chancellor has rendered to maintain the continuity of this highest academic event of the University despite times of great national and international challenges due to the COVID-19 pandemic which has devastated the world.

This year's conference theme: 'Security, Stability and National Development in the New Normal' has taken the current realities of our time into the consideration and how to achieve security and development in times of instability. In this context, I strongly feel that this is an important and commendable approach with innovation demonstrated by the KDU in focussing the attention towards a timely pertinent theme.

The national developments reiterate the importance of a Defence University especially when our motherland is facing unprecedented challenges due to the pandemic. Therefore, I must highlight that our ministerial guidance and blessings, have given the potential for the KDU to actively dwell on a developmental approach to research with Security and Stability as core drivers. This approach will enable the KDU to reach a leading position to guide and influence policy decisions through the knowledge and insights gained from its expansive research programmes.

Furthermore, I believe that the great minds that will lead research deliberations at this conference should actively contribute to aid the great endeavour of steering our beloved motherland towards greater heights in the security and economic spheres, as it is the ultimate responsibility of all Sri Lankans at this time of concern. Finally, I wish that the KDU IRC 2021 will provide a sheer guidance and lead the way towards national development mitigating all current and emerging challenges posed by this devastating pandemic situation. As I extend my sincere well wishes towards the Vice Chancellor, his team and all the participants of this conference for its successful execution and for their future endeavours, I would like to assure that my blessings and support will be with KDU at all times.

General Kamal Gunaratne (Retd)
 WWV RWP RSP USP ndc psc MPhil
 Secretary
 Ministry of Defence

Message from the Vice Chancellor



As the KDU celebrates its 40th anniversary, the International Research Conference is entering its 14th year and adapting to the new normal conditions and unprecedented challenges that have forced many programmes to be called off indefinitely. The evolution and continuity of the research conference into the successive 14th year adapting to challenges bears testimony for the success of the KDU as a seat of learning that can withstand any challenge national or international in nature.

The sheer number of papers that the conference received this year demonstrates the enthusiasm shown by presenters both locally and internationally even at a time of a grave crisis that has put educational institutions under severe stress, and it affirms the faith scholars have had on KDU. As the only defence university in Sri Lanka, KDU has been committed to research and knowledge production that will influence and shape the policy deliberations of security and development. These are core pillars of the stability and existence of any society, and it is our national responsibility to provide such insights through the organization of premier research dialogues.

This year's theme 'Security, Stability and National Development in the New Normal' bears witness to the civil military fusion that KDU has created and its commitment to achieving balance and resilience in times of global crises to safeguard and advance the security and developmental interests of the motherland.

KDU IRC is a platform of cooperation and diplomacy, and it encourages academic collaboration across Sri Lanka's higher education institutions. Research conferences are the ultimate networking events, and we are proud to provide these spaces of engagement where Sri Lankan and international scholars can present their findings and deliberate on the way forward for the nation and for the global community to thrive at a time humanity's resolve is tested by the pandemic. I wish all the very best for the academics, practitioners and policy makers who want to showcase their research and experience at our research conference.

Finally, I appreciate the dedication and hard work of all those who worked tirelessly over the last several months contributing in diverse ways to make the KDU IRC 2021 a reality under the trying circumstances, especially the IRC Chair, the Secretary, and the organizing committees headed by the Deputy Vice Chancellor (Defence and Administration).

Major General Milinda Peiris

RWP RSP VSV USP ndc psc MPhil (Ind)

Vice Chancellor

General Sir John Kotelawala Defence University

Message from the Conference Chair



KDU International Research Conference in its 14th iteration is held amidst celebration of its 40th anniversary and situated in local and global environment that is challenged by a new form of microbial security threat in the form the Covid19 outbreak. KDU stands strong and unbowed to maintain the continuity of this apex academic event this year on the theme, Security, Stability and National Development in the New Normal.

Challenged with the most potent wave of the pandemic, we remain undeterred thanks to the leadership of the Vice Chancellor. The organizing committee has put their heart and soul into adapting and evolving the conference formats that could withstand and confront the new normal conditions in organizing the international research conference.

Academic communities in the world are beacons of hope and resilience and given the sheer number of research papers that were submitted to the conference this year is a testament that KDU remains a space of hope for such communities and a sacred ground where research is encouraged even at trying times.

The theme of this year was a conscious decision to confront the realities that Sri Lanka and the world had to encounter since March 2020, that Covid 19 was a harbinger for a new reality. Universities are centres of resistance and renaissance and the KDU in Sri Lanka sets an example to all other institutions to emphasize the will to confront any challenge.

In this context KDU research conference is nourished by the presentations and deliberations of esteemed plenary speakers and research presentations that will provide vital insights into the key themes of security, stability, and national development. I extend gratitude and best wishes to all presenters who believe in the research culture evolved by the KDU and may you be treated to the finest KDU hospitality that transcend from physical to the cyber space and may you all be contributors to a greater cause for the sake of all humanity.

Dr Harinda Vidanage

PhD (Edin)

Conference Chair

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ORAL PRESENTATIONS

Classification of Patients with Epilepsy and Healthy Subjects Using Structural MRI; A Tensor-Based Morphometry Study

WADH Piyumali¹, GDYB Jayasinghe¹, S Egodage² and WM Ediri Arachchi^{1#}

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Computational neuroanatomy using magnetic resonance imaging (MRI) has been used extensively in studies of epilepsy to detect morphological abnormalities (Grey matter and White matter volumes) of the brain. However, it is unclear how epilepsy affects gross volume changes in the human brain. The aim of this study was to explore gross volume changes in the epileptic brain and to test the potential of gross volume changes to develop a neuroimaging tool for the objective diagnosis of epilepsy. We recruited 47 healthy controls and 48 epilepsy patients and T1 weighted structural MR brain scans were acquired using a 1.5 Tesla scanner at Army Hospital, Narahenpita, Sri Lanka. We applied the tensor-based morphometry (TBM) method (a variation of DBM) to generate voxel-level Jacobian determinant images using the Computational Anatomy Toolbox (CAT). Furthermore, group-level univariate analysis was conducted using two sample t-tests including age and gender as covariates. In addition, Multivariate pattern analysis (MVPA) was performed using univariate findings to distinguish patients with epilepsy healthy controls. We found widespread gross volume reductions in anatomical regions in frontal, temporal, and occipital regions and subcortical structures such as hippocampus and anterior cingulum. The multivariate pattern analysis (MVPA) results showed that gross brain volume changes can be effectively used to distinguish patients with epilepsy healthy controls (TBM: accuracy =70.83%). In summary, our study concludes that gross volume changes detected in epileptic brain should be considered when developing a neuroimaging tool for objective diagnosis of epilepsy.

Keywords: *deformation-based morphometry, structural MRI, multivariate pattern analysis, epilepsy*

Brachytherapy in Cervical Cancer: Accuracy in Point Dose Demarcation

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Brachytherapy dose specification point A, located 2 cm superior to the external cervical orifice and 2 cm lateral to the cervical canal, is a geometrical concept that represents the anatomic position where the uterine artery crosses the ureter. The study aimed to determine how well the Manchester point A represents the true anatomical point A (APA). The relationship between high - risk-clinical target volume (HRCTV) dimensions and the position of APA is also assessed to discuss the possibilities of individualizing the point-based brachytherapy. In this quantitative study, diagnostic contrast-enhanced computed tomographic scans of 48 patients with Carcinoma of the cervix/ endometrium were reviewed retrospectively. The same geometric coordinate system as Manchester point A was established; APA and HR-CTV were located and contoured on the CT data. Maximum HR-CTV dimensions on AP projection and coordinates of APA were recorded to assess correlations. The mean APA of the sample was at a vertical level of 1.18 ± 0.35 cm from the external-orifice along the uterine axis and 3.63 ± 0.52 cm laterally to either side. A significant moderate positive correlation exists between HRCTV dimensions and APA position. An approximate individualized Point A is defined using this correlation as a function of HR-CTV dimensions, which can easily be measured from radiotherapy planning CT scans. The proposed model is useful in a 3D-brachytherapy setup for individualized dose recording and can be used in a 2D-brachytherapy setup to individualize dose prescription if proven applicability.

Keywords: *Point A, brachytherapy, intracavitary, cervical cancer, Manchester point A*

Age and Gender-Related Variations of Adult Human Ocular Volumes in Sri Lankan Population: An Evaluation Using Magnetic Resonance Imaging

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Magnetic Resonance Imaging (MRI) can be treated as one of the best modalities for volume determination of soft tissue structures. As age and sex show a conspicuous influence upon the ocular volume, this study was aimed to evaluate the age and gender dependent variations in ocular volumes of Sri Lankan adults using MRI. This study was conducted with 200 adult brain MR images, reported as normal within the age of 18–90 years at the National Hospital, Sri Lanka. Ocular volumes were measured separately as 2D and 3D measurements by using an equation and software, respectively. Statistically significant differences in both ocular volumes were found with gender ($p < 0.05$) in both 2D and 3D volume analysis methods. On the contrary, while 3D measurements show a significant linear relationship with age in both eyeball volumes, 2D measurement showed a significant linear relationship with age only in the left ocular volume ($p < 0.05$). Weak negative correlations were found with age in right ocular volume in both 2D ($r = -0.121$) and 3D ($r = -0.168$) measurements and in left ocular volume in both 2D ($r = -0.151$) and 3D ($r = -0.179$) measurements. Furthermore, a statistically significant difference was found between the two volume measurement methods ($p < 0.05$) suggesting a partiality between them. Therefore, standardization between the two methods is required. This study concludes that both age and gender have a significant impact on ocular volumes. Since there are no recommended reference values for ocular volumes of the Sri Lankan adult population, this study may serve as normal reference values for the adult population in Sri Lanka. It also supports ophthalmologists and radiologists to quantitatively evaluate ocular pathologies.

Keywords: *ocular volume, MRI, 2D and 3D volume analysis*

Evaluation of Radiomics Analysis as a Tool in Differentiating Benign and Malignant Breast Masses Compared to Conventional Magnetic Resonance Imaging

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Breast cancer is one of the most common cancers among women globally. Therefore, we investigated the diagnostic feasibility of feature parameters derived from Radiomics analysis and conventional Magnetic Resonance Imaging (MRI) to differentiate benign and malignant breast masses. T1W Dynamic Contrast-Enhanced (DCE) breast MR axial images of 151 (benign (79) and malignant (72)) patients were chosen. Regions of interest were selected using both manual delineation and semi-automatic segmentation methods from each lesion. 382 Radiomic features were computed in the selected regions. A random forest model was employed to detect the most important Radiomic features that can differentiate benign and malignant breast masses. The ten most important Radiomic features obtained from manual delineation and semi-automatic segmentation based on the Gini index were applied to train a support vector machine. MATLAB and IBM SPSS Statistics Subscription software were used for statistical analysis. The accuracy of the model built from the 10 most significant Radiomic features obtained from manual delineation was 0.815, and sensitivity was 0.84. The accuracy of the model built from the 10 most significant features obtained from semi-automatic segmentation was 0.821, and sensitivity 0.87. All the top 10 Radiomic features obtained from manual delineation and semi-automatic segmentation showed a significant difference ($P < 0.05$) between benign and malignant breast lesions. This Radiomics analysis implemented based on DCE-BMRI revealed distinct Radiomic features to differentiate benign and malignant breast masses. Therefore, Radiomics analysis can be used as a supporting tool in detecting breast MRI lesions.

Keywords: *Dynamic Contrast-Enhanced breast MRI, manual delineation, semi-automatic segmentation, radiomic features, radiomics analysis.*

Determination of the Scatter Dose Received by Thyroid Region during Chest Wall Irradiation among Breast Cancer Patients Who Received Adjuvant Two-Dimensional Conventional Radiotherapy

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Breast cancer is the most frequent cancer among women, and radiotherapy plays a major role in the treatment of breast cancer. The significant amount of scatter dose to the thyroid region during adjuvant radiotherapy for breast cancers has been reported in previous studies. The purpose of this study was to determine the scatter dose received by the thyroid region during chest wall irradiation among breast cancer patients who received adjuvant two-dimensional (2D) conventional radiotherapy. Data was collected from 41 patients who had adjuvant 2D conventional radiotherapy as a treatment for carcinoma of the breast. The scattered dose was measured per one fraction of 267 cGy by using Polimaster PM1610 in a *Theratron*TM 780E ⁶⁰Co teletherapy facility at Apeksha Hospital Maharagama, Sri Lanka. A statistical analysis was performed using IBM SPSS. The mean values for the total scatter dose from glancing beams and the supraclavicular fossa (SCF) beam were 112.33 ± 5.50 mSv and 421.79 ± 32.49 mSv respectively. The mean value of the total scatter dose was 534.10 ± 34.11 mSv. 78.97% of the scatter dose was given by the SCF beam while the medial glancing and the lateral glancing were respectively 11.36% and 9.66%. In addition, the risk of the scatter radiation to the thyroid region among breast cancer patients who received radiotherapy with supraclavicular fossa irradiation was higher than in patients without supraclavicular fossa irradiation. Further studies need to be performed to estimate the scatter dose to the thyroid region in order to reinforce the conclusion.

Keywords: *scatter dose, chest wall irradiation, conventional radiotherapy, breast cancer*

Classification of Patients with Mild Depression and Healthy Controls Using Nodal Brain Network Topology

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The potential to use functional brain network topology in classification of patients with mild depression and healthy subjects using machine learning is poorly studied. The resting-state fMRI data of 51 patients with mild depression and 21 healthy controls were used in the current study. The data were pre-processed using the GRETNA toolkit. Each brain was parcellated into 90 anatomical regions. Functional brain networks were constructed using Pearson correlation. Then nodal level functional brain network metrics such as betweenness centrality, degree centrality, nodal clustering coefficient, nodal efficiency, nodal local efficiency, and nodal shortest path were computed using a graph theory-based approach for a series of network sparsity thresholds. The area under the curve value of each node was used as features (90 features in total for each subject) in subsequent multivariate pattern analysis (MVPA). The MVPA was performed using the MVPANI toolbox combined with LibSVM's implementation of a linear support vector machine. The classification performances were assessed using a leave-two-subjects-out cross-validation procedure. Classification accuracies were obtained for the six different topological metrics separately and for the combination of significant nodal metrics (concatenating features from different measures). The MVPA results showed that information from three out of six different nodal network metrics could significantly distinguish patients with mild depression and healthy controls (nodal clustering coefficient: accuracy =79.41%, $p<0.001$; Nodal efficiency: accuracy =79.41%, $p<0.001$, nodal local efficiency: accuracy = 79.41%, $p<0.001$). Further, when combining these metrics together, we observed an improved classification accuracy (85.29%, $p<0.001$), indicating the fusion of different network measures may serve as a better neuroimaging marker for an objective depression diagnosis.

Keywords: *brain network topology, depression, resting-state fMRI, multivariate pattern analysis*

Prevalence of Microalbuminuria in Rheumatoid Arthritis Patients Attending the Rheumatology and Rehabilitation Clinic at National Hospital, Sri Lanka

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Rheumatoid Arthritis (RA) is an autoimmune disorder that affects multiple synovial joints leading to bone and cartilage destruction. RA is associated with many co-morbidities. Sub-clinical renal dysfunction is one such complication that remains silent during the disease course. Therefore, the study was aimed to investigate the prevalence of microalbuminuria in RA patients and to determine the correlation of microalbuminuria with ESR and CRP which are considered biomarkers of RA. Fifty confirmed RA patients according to ACR EULAR criteria including both positives and negatives with or without deformities were selected from the Rheumatology and Rehabilitation Clinic of NHSL within 2 months period. The subjects did not have any clinical history of kidney diseases, diabetes mellitus, and hypertension. Socio-demographic data, medical and drug history were collected through an interviewer-based questionnaire while urine microalbumin, ACR, ESR, CRP investigations were carried out. Collected data were analysed statistically using SPSS version 23. The prevalence of microalbuminuria in the selected study population was 40%. Significant correlations were reported between microalbumin and CRP; ACR and CRP ($P < 0.01$) among elderly RA patients. Furthermore, there was a significant difference between the mean microalbumin and ACR values of RF positive and RF negative groups of the study population ($P < 0.05$). A significant correlation between ACR and disease duration ($P < 0.05$) was also observed. Therefore, it can be concluded that microalbuminuria and ACR together can be used as markers to detect early renal dysfunction related to RA and thus, morbidity and mortality among RA patients can be minimized.

Keywords: *rheumatoid arthritis (RA), microalbuminuria, albumin to creatinine ratio (ACR).*

Detection of the Minimum Inhibitory Concentrations for Meropenem in Resistant Coliform Isolates at National Cancer Institute Maharagama

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Carbapenem Resistant Enterobacteriaceae is a health problem worldwide due to overuse and misuse of antibiotics. The determination of minimum inhibitory concentration (MIC) using broth micro dilution (BMD) is the gold standard in defining optimal treatment and identifying microbial resistance. This determined the prevalence of Meropenem resistance among Coliforms and the MICs for Meropenem resistant Coliform isolates using several methods at the National Cancer Institute, Maharagama. Nine hundred and seventy-seven isolates were collected from blood, urine, sputum, and pus samples during September 2020-January 2021. Meropenem resistance was detected by the disc diffusion method in 332 Coliforms and tested for MICs using BMD. For the isolates recovered from blood, a comparison of MICs between the VITEK2 and BMD methods was also performed. Meropenem resistance was 67.2% (n=332) among Coliforms. MIC was performed on 87 Meropenem resistant Coliforms. Of these isolates, 85.1% (n=74) were resistant ($\geq 4\mu\text{g/ml}$), 13.8% (n=12) were intermediate ($2\mu\text{g/ml}$) and 1.19% (n=1) was sensitive ($\leq 1\mu\text{g/ml}$) by BMD method. Statistically significant differences were noted between the number of resistant isolates by disc diffusion and BMD methods ($p=0.00$) and MIC results obtained for blood isolates by BMD and VITEK2 methods (Kendall's τ beta $p=0.001$). In Sri Lanka, the determination of Meropenem usage is based on the results obtained by the disc diffusion method. The study emphasizes the limitations of using the disc diffusion method in situations where the prevalence of Meropenem resistance is high. This is of great clinical value as Meropenem is a broad-spectrum antibiotic and it is used for treating life-threatening infections.

Keywords: meropenem resistance, minimum inhibitory concentration

The Association of High Sensitive C-reactive Protein and Microalbuminuria with HbA1c Level among Type 2 Diabetes Patients in National Hospital of Sri Lanka

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Diabetic nephropathy is a long-term outcome of diabetes, which eventually leads to End-Stage Renal Disease. Inflammatory marker C-reactive protein may play a role as an indicator of low-grade inflammation in the development of diabetic nephropathy. The aim of this study was to evaluate the association between high-sensitive C - reactive protein (hs-CRP) and microalbuminuria with hemoglobin A1c (HbA1c) value among long-standing (≥ 5 years of 1st diagnosis) type 2 diabetes (T2DM) patients that have not yet been well reported in Sri Lanka. This descriptive cross-sectional study was conducted in the Diabetes and Endocrinology clinic at the National Hospital of Sri Lanka. Forty-nine T2DM subjects were enrolled in the study based on the HbA1c levels and investigator-administered questionnaire form. The hs-CRP, urine albumin, and urine creatinine were measured in all subjects, and the Albumin to creatinine ratio (ACR) was calculated. In an independent sample T-test, both urine microalbumin ($p < 0.05$) and hs-CRP ($p < 0.01$) were significantly associated with HbA1c level, while hs-CRP ($p < 0.05$) also showed a significant association with the onset of diabetes. The variance of hs-CRP was high in both the poor control HbA1c group and the long-standing T2DM group. The Pearson correlation showed a significant positive correlation between the hs-CRP and ACR ($p < 0.1$, $r = 0.246$). This study concludes that low-grade inflammation is associated with poor control among long-standing T2DM subjects. Further, the hs-CRP level may be a useful biomarker for identifying the risk of development of diabetic nephropathy along with ACR among well-established T2DM subjects with uncontrolled glycemic levels.

Keywords: *diabetes mellitus, albumin to creatinine ratio, high-sensitive CRP, HbA1c, diabetes nephropathy*

Simple Reliable Alternative Methods to Detect Plasma Haemoglobin in Red Cell Concentrates for Calculating Percentage Haemolysis at Peripheral Blood Banks

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Haemolysis is the major limiting factor in the lifespan of Red Cell Concentrate (RCC). It must be visually checked prior to transfusion. As a quality monitoring requirement, 1% of the monthly production of RCC must be tested for percentage haemolysis. According to international quality standards, the percentage haemolysis of RCC must be less than 0.8%. The plasma haemoglobin (Hb) required for calculating percentage haemolysis is presently measured using a Plasma / Low Hb photometer (LHBP), which is available only at the National Blood Centre (NBC). To address this issue, we introduced two alternative methods compared with the gold standard (LHBP) to help peripheral blood banks (PBB) determine plasma Hb concentration. These methods are the Visual Haemoglobin Colour Scale (CS) and the Standard-hemolysate Capillary Tube Comparison (SCTC) method. To prepare these alternative methods, a standard-hemolysate was prepared using an unexpired RCC of mean Hb concentration. A concentration series having plasma Hb values from 0.1g/dl to 1.0g/dl was prepared from the hemolysate. These methods were tested on RCCs which were received by NBC for haemolysis determination. A strong correlation was observed between LHBP method and the alternative methods. According to the statistics, both alternative methods give statistically comparable results to the LHBP method.

Keywords: *capillary tube comparison, hemoglobin colour scale, percentage haemolysis*

An attempt to Detection of Iron Overload and Its Complications in Beta Thalassemia Major Patients at Thalassemia Unit Kurunegala by Investigating Some of the Laboratory Parameters

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Thalassemia is the commonest single gene disorder in Sri Lanka that causes an overwhelming weight of suffering on families and a large financial cost to the health service. The aim of the study was to detect organ related complications of beta thalassemia major patients (β TM) with iron overload and chelated status using some of the laboratory parameters. Patients from age 2-35 years who were diagnosed with β TM (n=68) were selected and obtained Serum Ferritin (SF), Haemoglobin, LFT, RFT and endocrinological records from their BHTs. The data was collected at 6-month intervals for a maximum of 2 1/2 years after treating with iron chelation. Correlations were obtained by analysing SF with other parameters using SPSS version 20. The correlation takes place within the same parameter and between different parameters and the former is prominent. The 6th month value of SF is highly correlated with the 6th month AST ($p=0.02 < 0.05$). As an example, the 6th month AST value is correlated with 12th ($p= 0.032$) and 30th month ($p= 0.020$) of itself. In the same manner, the Serum Creatinine value of 6th month is correlated with 18th ($p= 0.032$) and 12th month ($p=0.000$) itself. In this study, we found an association between SF and AST at 6 months after initial iron chelation therapy. However, prior to implementing the outputs of the laboratory results, an increasing sample size with time duration should be applied. Additionally, more laboratory parameters that are specified for a particular organ should be considered.

Keywords: *thalassemia, serum ferritin, AST, serum creatinine*

Effect of Haemolytic Interference on Lactate Dehydrogenase Activity in Pooled Normal Serum

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Measurement of serum Lactate Dehydrogenase (LDH) activity plays a pivotal part in the diagnosis and treatment of liver disease, myocardial infarction, anaemia, muscle trauma, and cancers. Meanwhile, haemolysis is one of the most important interfering substances in LDH measurement. This study was aimed to evaluate the haemolytic interference on LDH activity in pooled serum samples. Twenty different haemoglobin concentrations (0.05 to 5g/dL) were prepared from a haemolysate. Non-haemolysed serum samples were used to prepare pooled serum which was aliquoted and treated separately with different haemoglobin concentrations. The LDH activity and the haemoglobin concentrations were measured by French Society of Clinical Biology (SFBC) modified kinetic method and cyanmethaemoglobin method respectively. All the analyses were performed in triplicates. Baseline haemoglobin concentration was below the limit of quantification. Baseline LDH activity of pooled serum was 202.38 IU/L. There was a strong positive correlation between LDH activity and haemoglobin concentrations (Pearson correlation coefficient (r) = 0.980, $p < 0.001$, $R^2 = 0.868$). Statistically significant mean differences of LDH activities were found between all twenty different haemoglobin concentrations and baseline LDH activity ($p < 0.001$), more importantly, even at very low haemoglobin concentration (0.005g/dL). Prediction equation for corrected LDH activity: Corrected LDH activity = (2183.7 * Haemoglobin concentration) + Baseline LDH activity ($R^2 = 0.868$). There was a statistically significant strong positive correlation between serum LDH activity and haemoglobin concentration ($r = 0.990$, $p < 0.001$, $R^2 = 0.868$). Therefore, LDH activity should be reported upon correction using haemoglobin concentration. However, further studies including different baseline LDH activities and larger samples are needed to validate the findings of the present study.

Keywords: correction factor, haemolysis, Interference, LDH

The Relationship between Early Physiotherapy Intervention and Shoulder Joint Mobility among Breast Cancer Survivors in Sri Lanka

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Breast cancer is the most common cancer among women worldwide, including Sri Lanka. Modified Radical Mastectomy (MRM) is the standard surgical management when the breast conservation is not considered as an option. However, common post-surgical complications of MRM include impairment of shoulder joint mobility and lymphedema which could be managed well with early physiotherapy intervention. This study was aimed to identify the relationship between shoulder joint mobility and early physiotherapy intervention among breast cancer survivors at Apeksha hospital, Maharagama, 74 female breast cancer patients referred to the Department of Physiotherapy for the first time were recruited for this study. Patients with history of shoulder joint injuries or other pathologies were excluded from the study. An interviewer-administered questionnaire was used to collect information of socio-demographic data and underwent surgical procedures. Shoulder joint Active Range of Motions (AROM) (flexion, extension, abduction, Internal Rotation (IR) and External Rotation (ER)) of the affected side was measured by universal goniometer following standard procedure. Delayed period to commence physiotherapy of the sample ranged from < 1 year to 17 years. According to the findings, the mean values of AROM of flexion, extension, abduction, IR, and ER were $157^{\circ} \pm 14^{\circ}$, $51^{\circ} \pm 5^{\circ}$, $137^{\circ} \pm 22^{\circ}$, $70^{\circ} \pm 12^{\circ}$, $75^{\circ} \pm 8^{\circ}$, respectively. A significant negative relationship showed between delayed physiotherapy intervention and shoulder joint AROM of flexion ($p=0.05$, $r=-0.82$), extension ($p=0.05$, $r=-0.54$), abduction ($p=0.05$, $r=-0.75$), IR ($p=0.05$, $r=-0.76$) and ER ($p=0.05$, $r=-0.74$). Therefore, shoulder mobility limitation increases with time of delayed physiotherapy intervention. Hence, it is advisable for patients to participate in early physiotherapy interventions to reduce the level of shoulder immobility.

Keywords: *breast cancer, shoulder mobility, physiotherapy*

Comparison of Lower Extremity Intrinsic Factors Between Non-Contact Anterior Cruciate Ligament Injured and Non-Injured Elite Football Players of the Super League in Sri Lanka

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Non-contact Anterior Cruciate Ligament (ACL) injuries are one of the commonest types of knee injuries among elite football players, which has a negative impact on the overall performance and quality of life of players. There are many risk factors for ACL injuries. It is important to study the association between intrinsic risk factors and ACL injuries because of their higher prevalence, expensive treatment methods, and secondary complications which occur in athletes. A retrospective case-control study was conducted, among 31 male elite football players aged 20-25 years. Of the total sample, 15 players presented with a history of non-contact ACL injury, and 16 players did not have a history of non-ACL injury. Height, weight, and body-mass index (BMI) were measured in all participants, to evaluate the degree of similarity between the two groups. The intrinsic factors measured were femoral torsion, tibial torsion, both measured using the universal goniometer, pronation of the foot measured by the navicular drop test and flat feet assessed using the Staheli plantar arch index. Data were analysed using SPSS software version 26.0. Mean age of study participants was 22.13 ± 1.0 years and mean BMI was 21.3 ± 1.55 kg/m³. There was no significant difference in all intrinsic factors between the injured and non-injured groups at $p < 0.05$. A significant difference ($p < 0.05$) in pronation of the foot was observed between the affected and non-affected limbs within the injured group. In conclusion, pronation of the foot is an intrinsic factor influencing the lower extremities for non-contact ACL injury.

Keywords: *non-contact anterior cruciate ligament injury, football, femoral torsion, tibial torsion, pronation of foot, flat feet*

Relationship between Craniovertebral Angle with the Long-Term Usage of Electronic Devices among Undergraduates of General Sir John Kotelawala Defence University

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Long-term usage of electronic devices among undergraduates has become a growing problem all around the world. Prolong usage of these devices can result in malalignment of the normal posture. Forward head posture (FHP) is known as the commonest postural abnormality resulted due to long term usage of smartphones and laptops. The purpose of this study was to determine the relationship between craniovertebral angle with the duration of smartphone and laptop usage among undergraduates, Faculty of Allied Health Sciences, General Sir John Kotelawala Defence University. This is a descriptive cross-sectional study. 228 undergraduates, within 19- 24 years of age, using smartphones and laptops for more than 1 year were recruited by the consecutive sampling method. Those who had previous cervical injuries/congenital deformities and who didn't grant informed consent were excluded. A self-administered questionnaire was given to collect information. CVA was measured by lateral view photographs using the KINOVEA app. According to the results the mean values of age, BMI and CVA were (21.83±1.57 years), (22.86±4.39kg/m²), (46.53±5.49degrees). Pearson correlation coefficient was used to quantify the linear relationship of CVA with the duration of smartphone, laptop usage and BMI. A statistically significant negative correlation was obtained between CVA and the duration of smartphone usage (p < 0.05, r = -0.35), duration of laptop usage (p < 0.01, r = -0.047) and BMI (p < 0.01, r = -0.55). The findings of the study concluded that long-term usage of electronic devices could result in reducing the craniovertebral angle. Furthermore, BMI has a statistically significant negative relationship with CVA.

Keywords: *craniovertebral angle, smartphones, laptops*

The Correlation between Incidence of Falls and Quadriceps Muscle Strength among Patients with COPD from Two Selected Government Hospitals in Colombo District

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Skeletal muscle dysfunction is one of the extrapulmonary manifestations in patients with chronic obstructive pulmonary diseases (COPD). Quadriceps muscle strength plays an important role in maintaining the postural stability of a human. The objectives of the study were to determine the incidence of falls and to identify the probability of risk of falls among COPD patients in relation to quadriceps muscle strength among patients who presented to the National Hospital for Respiratory Diseases, Welisara, and the Chest Clinic at the Medical Research Institute, Sri Lanka. This descriptive cross-sectional study was conducted among 35 COPD patients between 40-60 years of age. The quadriceps strengths of bilateral lower limbs were measured using the one repetition-maximum (1RM) strength test and the incidence of falls was assessed using an interviewer-administered questionnaire. The test results indicated a significant positive correlation between the incidence of falls and right side 1RM ($p=0.019$, $r=0.395$) and left side 1RM ($p=0.033$, $r=0.362$). The results showed a significant positive relationship between the probability of risk of falls and right side 1RM ($p=0.030$, $r=0.601$) and left side 1RM ($p=0.040$, $r=0.537$). According to the results of the study, a significantly positive correlation between the incidence of falls and the quadriceps muscle strength of COPD patients was identified. Further, the results show an increase in the probability of falls risk with the reduction of quadriceps muscle strength.

Keywords: *quadriceps muscle strength, COPD, falls Incidence*

Level of Physical Activity and Changes in Lifestyle-Related Behaviour during COVID -19 Pandemic, among Undergraduate Medical Students of Faculty of Medicine, University of Colombo, Sri Lanka: A Cross-sectional Study

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The COVID-19 pandemic and related lockdown could prevent students from achieving the recommended levels of physical activity due to home confinement, and it also could lead to changes in lifestyle related behaviour. Medical students are already known as a risk group for physical inactivity. Therefore, the aim of this study was to identify the level of physical activity and lifestyle related behaviour during the COVID-19 pandemic among undergraduate medical students. A web-based survey, consisted of questions from the International Physical Activity Questionnaire (IPAQ) short form and a lifestyle related behaviour questionnaire, was used as a Google form. A total of 244 participants (age= 22.55±1.84, n=110; 45.1% males and n=134; 54.9 %females) completed the questionnaire. The mean weekly total metabolic equivalent (MET) minutes of the population was 1039.71±1234.96. Majority (47.1%) were inactive while only 9.4% were highly active according to the IPAQ categorical score. Vigorous, moderate, and total MET-minutes/week were significantly higher in males compared to females ($p<0.05$). There was a statistically significant difference in total MET minutes per week among different BMI categories determined by one-way ANOVA. The Tukey post hoc test revealed that total MET minutes/week was significantly lower ($p=0.035$) in underweight participants (697.77±844.38) compared to overweight participants (1482.09± 1662.52). The study identified that a higher percentage of participants were inactive. Thus, strategies should be implemented to promote physical activity and active lifestyles among undergraduate medical students, especially during a pandemic like COVID-19.

Keywords: *physical activity, COVID 19, lockdown, lifestyle, medical undergraduates, Sri Lanka*

Prevalence of Evidence Based Physiotherapy Interventions for Children with Cerebral Palsy in Colombo District, Sri Lanka: A Cross Sectional Study

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Cerebral Palsy (CP) is one of the common causes of childhood disability. The aim of this study was to assess the prevalence of evidence-based physiotherapy interventions for children with CP. This descriptive cross-sectional study was conducted at the Physiotherapy Units of Lady Ridgeway hospital, Rheumatology, and rehabilitation hospital Ragama, and Colombo North teaching hospital. CP types were classified using the Gross motor function classification Scale (GMFCS), and the Evidence Alert traffic light system was used to select interventions and classify outcomes as Green (Do it), Yellow (Probably do it) and Red (Don't do it). Observation methods and face to face interviews were used as the data collection methods. Data were analyzed using the Service Package of Social Sciences (SPSS) version 22.0. A hundred participants aged between birth to 12 years were selected to study. According to the findings, the highest demanded interventions in the population (Strength training- 93%, mobility training -91%, Goal directed training -80%) resulted in green outcomes. The outcomes of interventions distributed per single child as Green 40.22%, Yellow 56.94% and Red-2.84%. The majority of the sample belongs to the 4-6-year-old age range (62%), GMFCSE&R grades IV (27.7%) and, Spastic Diplegic (29.7%) CP type. There is no significant difference between intervention types applying to the different GMFCS levels, CP Types, and age ranges. There is a positive correlation between the distributions of GMFCSE&R and CP types ($P=0.02$, $P<0.05$). The most prominent distribution of yellow outcomes (56.94% per a single child) proved the median status of physiotherapy practice in three clinical settings.

Keywords: *cerebral palsy, evidence based practice, physiotherapy*

Quality of Life and Its Related Factors among Patients with Stroke in Selected Tertiary Care Hospitals in Sri Lanka

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The factors related to the quality of life (QoL) among patients with stroke are context bounded and observed inconsistent findings. Therefore, a descriptive cross-sectional study was conducted to identify the factors related to the quality of life among patients with stroke by using convenient sampling (n = 134) in the 5 selected tertiary care hospitals, Sri Lanka. The QoL was assessed by the pretested Short Form-36 (SF-36) which consisted of 8 domains. The Multiple Linear Regression (MLR) was performed to determine the associated factors while the significant level was kept as $p < 0.05$. Nearly 68% of the sample was male and the mean age was 65.4 ± 12 (SD) years. The mean score of physical functioning, bodily pain, general health, vitality, social functioning, role limitation emotional, mental health and role limitation physical domains of QoL were 21.9 ± 25.5 , 63.3 ± 29.1 , 44.7 ± 15.9 , 51.6 ± 23.6 , 59.2 ± 25.6 , 32.5 ± 44.3 , 60.0 ± 18.3 and 23.6 ± 40.1 respectively and some domains were below the level of average 50. MLR revealed that the aphasia, disability of face, disability of lower limb, disability of vision, dysarthria, dyslipidaemia, smoking status, alcohol consumption, geographical area, monthly income, type of stroke, and caregiver as the related factors of QoL among patients with stroke ($p < 0.05$). Therefore, awareness of these related factors may be helpful to improve the quality of life of patients with stroke and helpful for healthcare professionals to plan early interventions.

Keywords: *stroke, quality of life, related factors*

An Exploration of Mothers' Experience of Children with Thalassaemia Depending on Iron Chelation Therapy in Thalassaemia Centre of Provincial General Hospital Badulla

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Thalassaemia is a genetic disorder characterized by insufficient production of haemoglobin. Regular blood transfusions are required for the survival of these children. Hence, this study aimed to explore the mothers' experiences of children with Thalassaemia depending on Iron Chelation Therapy in the Thalassaemia Centre of Provincial General Hospital Badulla (PGH-Badulla). In this phenomenological study, 12 mothers who are caring for their children (<12 years old) with Thalassaemia depending on Iron Chelation Therapy in the Thalassaemia Centre of PGH-Badulla, were purposefully selected. Face-to-face in-depth interviews were performed using a semi-structured interview guide. Data were analysed using Marshall and Rossman's thematic analysis method. Ethical approval was obtained from the Ethics Review Committee, the National Hospital Sri Lanka. Mothers' experiences were classified into four main themes namely "fear and worry", "good service for the cure", "support to save the children" and "neglect others and self-care". Mothers' worried about financial difficulties, caring tension, and uncertainty about the child's future. Hence, they expect good service for the cure of their children through effective treatments, care from the hospital staff, and avenues for more health information. Further, these mothers neglect self-care, family, and social relationships due to this sacrifice to look after their children with Thalassaemia. Caring process of children with thalassaemia has affected negatively on several aspects of mothers' life including psychological, physical, and socio-economic difficulties. Assistance from family, healthcare providers, government, and voluntary organizations is required for mothers to overcome these burdening issues.

Keywords: *mothers' experiences, thalassaemia disease, iron chelation therapy*

Assessment of Treatment Adherence Behaviours and their Predictors among Patients Receiving Haemodialysis in Kurunegala Teaching Hospital, Sri Lanka

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The success of haemodialysis is dependent on adherence to a complex therapeutic regimen. As the reported prevalence of non-adherence varies widely, the aim of the study was to assess selected treatment adherence behaviors and their predictors among patients receiving haemodialysis. A descriptive cross-sectional study was carried out among a convenience sample of 150 patients receiving hemodialysis at Kurunegala Teaching Hospital. Self-reported adherence to haemodialysis attendance, prescribed medications, dietary recommendations and fluid restrictions were assessed using a validated End Stage Renal Disease- Adherence Questionnaire (ESRD-AQ). Data analysis was performed using IBM SPSS version 25.0 software. The study group consisted of 72.7% of men, and the mean age was 54.08±10.78 years. Reported adherence to haemodialysis attendance, prescribed medications, dietary recommendations and fluid restrictions were 96.0%, 96.7%, 71.3% and 32.7% respectively. The higher percentage (98.0%) of patients reported good perception of adherence to prescribed medications compared to diet (92.0%), haemodialysis attendance (94.0%) and fluid restrictions (92.0%). Overall, 81 (54.0%) patients had good adherence to all four treatment modalities while 134 (89.3%) patients had good perception. There was a significant correlation between overall adherence and overall perception score ($p=0.013<0.05$). Patients who were employed ($p=0.042$), had good income ($p=0.022$) and able to afford monthly expenditure for the treatments ($p=0.043$) had significantly good adherence, while the patients who had forgetfulness treatments had a significantly low level of adherence ($p=0.000$) ($p<0.05$). Measures should be taken to improve patients' adherence to dietary recommendations and fluid restrictions.

Keywords: *haemodialysis, adherence, perceptions, predictors*

Relationship between Hypothyroidism and Non-alcoholic Fatty Liver Disease among Patients Attending the Endocrinology Clinic, Colombo South Teaching Hospital, Sri Lanka

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Hypothyroidism and Non-alcoholic fatty liver disease (NAFLD) have been identified as two major problems rising at a higher rate. Several studies have revealed the relationship between hypothyroidism and NAFLD. However, local data is scarce. The current study was focused on identifying the relationship between Hypothyroidism and NAFLD among the patients who attended the Endocrinology clinic, Colombo South Teaching Hospital, Sri Lanka. A descriptive cross-sectional study was conducted with 37 hypothyroid patients aged 18 to 60 years. Out of the 97% were females and the mean age of the participants was 37 years. An interviewer-administered questionnaire was used to obtain the socio-demographic data, family and clinical history, and BMI (Body Mass Index) of all the participants. Blood samples were collected to perform laboratory investigations; TSH, FT4, Lipid profile, AST, ALT, and GGT. NAFLD was diagnosed by performing an ultrasound scan. Data analysis was performed using SPSS version 20. About, 62% of the participants were diagnosed as having NAFLD. Age ($p < 0.05$), BMI ($P < 0.05$), Triglyceride ($p < 0.05$), VLDL ($p < 0.05$), Total cholesterol: HDL ratio ($p < 0.05$), AST ($p < 0.05$), ALT ($p < 0.05$) and GGT ($p < 0.05$) showed a significant difference between NAFLD and non-NAFLD groups, whereas TSH and FT4 levels did not show any significant difference. GGT also showed a significant difference ($p < 0.01$) between the subclinical and overt hypothyroid groups. Significant associations between age and Fatty Liver status ($p < 0.05$), BMI, and Fatty Liver status ($p < 0.01$) were also observed. No statistically proven relationship was found between Hypothyroidism and NAFLD even though a coincidence was observed in descriptive statistics.

Keywords: *non-alcoholic fatty liver disease, subclinical hypothyroidism, overt hypothyroidism*

Medication Practices in the Management of Upper Respiratory Tract Infections among Undergraduates of University of Jaffna, Sri Lanka

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Upper respiratory tract infections (URTIs) are one of the most commonly encountered diseases in both paediatric and adult populations and they represent a significant cause of antibiotic abuse which contributes to antibiotic resistance. This study mainly aimed to evaluate the medication practices of URTIs among undergraduates at the University of Jaffna. A descriptive cross-sectional study was conducted among 382 undergraduates of University of Jaffna from July 2019 to November 2020. Stratified random sampling was performed to recruit the participants and the data were collected using a self-administered questionnaire and analysed using SPSS version 23. The response rate was 82.1% (n=314) for this survey. The majority of the respondents were female (64.0%) and unmarried (97.1%). Almost 45.0% of participants had URTIs at least once in the last three months and the common cold was the most frequently reported URTI symptom. Most of the students had antipyretics (74.8%), Vitamin C (73.8%), herbal remedies (72.0%), antibiotics (63.7%), cough syrups (55.0%) and antihistamines (54.4%) to treat their URTIs. A considerable number of students, 42.0% had self-medicated with antibiotics. Compared to Health Science students, Non- Health Science students significantly shared their antibiotics with friends or family members ($p < 0.05$) and kept leftover antibiotics to be used in similar disease conditions in the future ($p < 0.05$). This study concluded that majority of the undergraduates at the University of Jaffna had inappropriate antibiotic usage in URTIs and it suggested that educational programs should be designed to educate undergraduates irrespective of course of study regarding rational usage of antibiotics.

Keywords: *URTIs, Practices, Undergraduates, University of Jaffna*

A Counselling Intervention to Improve Treatment Adherence of Ischemic Heart Disease Patients: The Development of a Protocol

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Ischemic Heart Disease (IHD) is classified as one of the world's major cardiovascular diseases and has become the leading cause of deaths in Sri Lanka. Poor treatment adherence plays a significant role in re-hospitalization and death related to IHD. Therefore, a socio-culturally appropriate health counselling intervention was developed for a psychological interventional study to enhance the adherence of prescribed physical activity, diet, and medication among IHD patients attending medical clinics in selected hospitals in Galle district, Sri Lanka. The protocol mainly consisted of two sections (Assessment and Intervention) and six subsections. The intervention method consisted of communication skills, motivational interviewing, goal setting, and problem-solving. An expert panel consisted of a consultant physician, two clinical psychologists, a nurse educator, and a nurse in charge of a health education unit reviewed each subsection on a scale of 0 (total disagreement) to 9 (total agreement) under four aspects in the Delphi review. The ratings in stage one were evaluated and resent for a second round, and the re-ratings were re-evaluated for a degree of consensus. Each subsection was revised or removed if 70% or more of the re-ratings were in categories 0–3 and retained if 70% or more of the re-ratings were in categories 4–6 and 7–9. All the subsections were retained, and few modifications were made as per the expert views. This health counselling intervention protocol is expected to be used in the interventional study among patients with IHD in selected hospitals in Galle district, Sri Lanka.

Keywords: *Ischemic Heart Disease, counselling intervention, Sri Lanka*

Knowledge, Attitudes, and Practices on E-health Literacy among FAHS Undergraduates of KDU

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Studies have recorded the usefulness and the instances where e-health was misused due to lack of knowledge. Hence, this study was designed to evaluate the knowledge, attitudes, and practice on e-health literacy among allied health undergraduates. A descriptive cross-sectional study was conducted on 407 allied health undergraduates of Kotelawala Defence University in 2020. The convenience sampling was followed due to its feasibility during the Covid-19 pandemic situation. A self-administered questionnaire was used. Descriptive analysis was performed to describe the knowledge, attitudes, and practice of e-health followed by linear regression to identify the factors associated with e-Health literacy. The e-health knowledge was measured using a validated e-health literacy scale (e-HEALS). The majority of participants were females (76.9%). The mean scores of e-health knowledge and attitude were, 28.83 (SD ± 5.30), and 29.76 (SD ± 5.39), respectively. High e-health literacy was noted among 84.02%. Mobile health applications were used by 48.4% to access a variety of health-related information. A significant association was noted with females and the frequency of mobile health application use rather than with males ($p < 0.05$). There was a significant relationship between e-health literacy and the intake of students ($p < 0.05$). Attitude increased significantly with intake and degree followed ($p < 0.05$). The study confirmed that e-health literacy of allied health sciences students was at a satisfactory level. This study revealed new paths for conducting further studies by healthcare professionals to assess the ability of e-health use for the betterment of patient care.

Keywords: *e- health, e-health literacy, e-HEALS*

Evaluation of *In Vitro* Antibacterial Activity and Anti-inflammatory Activity of *Artocarpus nobilis* Thw. (Bedi del/Wal del)

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Rising antimicrobial resistance and the serious side effects of anti-inflammatory agents have led to increased concern about natural alternative remedies. Medicinal plants stand out as potent, yet safer, options for these challenges. *Artocarpus nobilis* Thw. is an endemic tree used to treat infections and inflammation in Sri Lankan folk and Ayurvedic medicine. This laboratory-based experimental study was conducted to evaluate the *in vitro* antibacterial and anti-inflammatory activities of *A. nobilis* Thw. leaves and bark in aqueous, methanol, dichloromethane, and hexane extracts obtained by the decoction method. Antibacterial activity was determined against *Escherichia coli* (ATCC 25922) and *Staphylococcus aureus* (ATCC 25923) using the agar well diffusion method and zones of inhibition were measured. The highest antibacterial activity against *E. coli* was exhibited by aqueous bark extract (zone diameter 13.66±0.33 mm, half maximal effective concentration (EC₅₀) 4.286 mg/ml) and for *S. aureus* it was exhibited by methanol bark extract (zone diameter 25.66±0.33 mm, EC₅₀ 4.427 mg/ml). *In vitro* anti-inflammatory activity was determined using the heat-induced protein denaturation method. The concentration series of the extracts and the reference drug, diclofenac sodium were used to determine percentage inhibition of protein denaturation. The results revealed that the highest anti-inflammatory activity was shown by methanolic bark extract (half maximal inhibitory concentration (IC₅₀) 249.8 µg/mL) when compared to the reference drug (IC₅₀ 243.4 µg/mL). These novel findings indicated the potential of developing a drug for bacterial infections and inflammation based on the leaves and bark of *A. nobilis* Thw. Therefore, further investigations are needed to confirm these results.

Keywords: *Artocarpus nobilis* Thw., antibacterial activity, anti-inflammation

Determination of Duration of Consistency of the Antacid Activity in Aqueous, Ethanolic, Hexane Extracts and Quantitative Determination of Flavonoids and Polyphenols of *Evolvulus alsinoides* (L.) L

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Evolvulus alsinoides (family Convolvulaceae) is commonly known as “Nil Vishnukranthi” or “Shankhpushpi” in Sri Lanka and is used in the treatment of gastric ulceration. In our previous studies, we have investigated the *in-vitro* antacid potential of aqueous extract (aqE), ethanolic extract (EE) and hexane extract (HE) of *E. alsinoides* by neutralization of artificial gastric juice and modified Fordtran’s titration method. This study aimed at (a) determination of duration of consistency of the antacid activity of aqE, EE and HE of *E. alsinoides*; and (b) quantitative determination of total flavonoids content (TFC) and total polyphenol content (TPC). The duration of consistent antacid activity was determined using Vatie’s artificial stomach model (pH of artificial gastric juice =1.2 at a rate of 3 mL/min). Test solutions were prepared from aqE, EE and HE and the reference drug (ENO). The time taken for an amount of 10mL of each sample to reach pH 3.0 at 37°C and 50rpm was recorded. Each test was triplicated. TPC and TFC of each fraction were quantified using gallic acid (GA) and quercetin (QE) as the standards respectively. The aqE exhibited a statistically significant duration of consistency of antacid activity (<0.001) compared to the negative control. The duration of consistency of the EE and HE were not significant compared to the respective negative controls. TFC in aqE, EE, and HE were 464.53±0.05, 570.63 ±0.11 and 523.34 ±0.02 mgQE/g and TPC were 246.02±0.00, 302.19±0.01, and 17.14±0.00 mgGAE/g respectively. Hence, flavonoids and polyphenols present in *E. alsinoides* may not significantly contribute to the antacid activity of aqE.

Keywords: *Evolvulus alsinoides*, antacid, gastroprotective, Fordtran’s model, Vatie’s artificial stomach model

Host-Guest Complexation Behaviour of NSAIDs with β -Cyclodextrin: A Molecular Dynamics Study

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Cyclodextrins (CDs) are cyclic oligosaccharides that are used as functional excipients to modify the physical, chemical, and biological properties of drugs via forming inclusion complexes. The outer surface of CDs is more hydrophilic than the interior and hence entrap guest molecules in the cavity. Among three natural CDs (α , β , and γ), β -CD is widely used due to its favourable pharmaceutical and toxicological properties. A series of docking inspired Molecular Dynamics (MD) simulations were carried out using NAMD 2.1; MD code with CHARMM-36 force field to examine the host-guest inclusion behaviour of β -CD and selected Non-Steroidal Anti-inflammatory drugs (NSAIDs); Aspirin, Ibuprofen, Piroxicam, Meloxicam, Ketoprofen, Indomethacin, Naproxen, Diclofenac and Acetaminophen. Resulted trajectories were analyzed to find out the energy and Solvent Accessible Surface Area (SASA) changes during the complexation and to identify the inclusion parts of the guest molecules. The result revealed that the inclusion complex formation is possible even with electronegative functional groups of drug molecules, especially when they have oxygen, particularly through carboxylic functional groups and other heteroatoms, confirming that the β -CD-cavity is not strongly hydrophobic. Molecules are in contact with β -CD molecule probably by making hydrogen bonds, and they further stabilize the complex. Drugs can freely move within the β -CD cavity and the complexes are dynamic and are predominantly found around an average energy conformation, which is not the lowest energy state. Naproxen, indomethacin, ibuprofen, and ketoprofen are indicated to form the most stable complexes with β -CD.

Keywords: *molecular dynamics, β -Cyclodextrin, NSAIDs*

Quality and *In vitro* Equivalence Testing of Chloroquine Phosphate 250 mg USP Tablets in Sri Lanka

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Exceptionally high quoted unit prices of antimalarials and the non-availability of World Health Organization (WHO) pre-qualified registered suppliers were two main challenges in procuring antimalarials in Sri Lanka. As such, having bioequivalence/ biowaiver studies to ensure the therapeutic performance of generics is of paramount importance since they can reduce the annual health expenditure associated. The objective of this study was to ensure the interchangeability of the generic chloroquine tablets produced locally by the State Pharmaceutical Manufacturing Corporation (SPMC) with a WHO prequalified product. Chloroquine is classified as eligible for biowaiver by the WHO based on its Biopharmaceutical Classification (BCS). Randomly selected three batches of generic tablets manufactured by SPMC and a batch of prequalified Chloroquine phosphate 250 mg from Anti-Malarial Campaign (AMC) Sri Lanka were tested for quality and comparative dissolutions according to the United States Pharmacopeia (USP) specifications. All four batches passed the weight variation, friability, disintegration, dissolution, and assay as per the specifications of USP, but the hardness test was passed only by the WHO prequalified product. In the comparison of dissolution test results, the locally produced generic product showed the highest standard of quality plus invitro equivalence that supported biowaiver conditions. The study confirmed that the SPMC chloroquine is of good quality and is equivalent to the reference product and hence interchangeable with the current Chloroquine Phosphate tablets used by the AMC.

Keywords: *chloroquine phosphate, quality assessment, biowaiver*

Photoprotective and Antioxidant Activities of Leaf, Fruit and Seed Extracts of *Cynometra Cauliflora*: A Comparative Study

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At present, there is a growing interest in the development of broad-spectrum, safe herbal sunscreen products. This study aimed to investigate the sun protection potential of fruits, leaves, and seeds of *Cynometra cauliflora* (Naminan) by evaluating the Sun Protection Factor (SPF) and antioxidant activities. Plant extracts of unripe fruit (CUF), ripe fruit (CRF), seeds (CS) and mature leaves (CML) of *C. cauliflora* were prepared by ultra-sonication using methanol as the solvent. In vitro SPF of each extract was determined spectrophotometrically using the Mansur equation and antioxidant activity was analyzed in terms of Total Phenolic Content (TPC) and DPPH radical scavenging activity. The correlation between SPF and antioxidant activity was also analyzed. Data were statistically analyzed using Microsoft Excel 16.0 and IBM SPSS 23.0 software (n=3). The concentration of 0.5 mg/mL methanolic leaf extract of *C. cauliflora* exhibited the highest SPF of 28.41 ± 0.75 compared to other extracts. The order of decreasing SPFs was CML > CS > CRF > CUF. The highest TPC (362.50 ± 3.47 mg GAE/g of extract) and the DPPH radical scavenging activity ($IC_{50} = 11.22$ μ g/mL) were demonstrated by mature leaves of *C. cauliflora*. A strong positive correlation between SPF and antioxidant activities of extracts was also revealed. It can be concluded that mature leaf extract of *C. cauliflora* at a concentration of 0.5 mg/mL exhibits promising sun protective activity which may be mediated by the antioxidants. Further, results indicate the possibility of the formulation of sunscreens using *C. cauliflora* leaf extracts.

Keywords: *Cynometra cauliflora*, sun protection factor, antioxidant activity

Does Institutionalization Influence Negatively on the Quality of Life of Elders? A Comparative Cross-sectional Study in Galle, Sri Lanka

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In Sri Lanka, the relationship between quality of life (QoL) and the living arrangements of the elderly has not been adequately studied. The aim of this study was to access the QoL of institutionalized and non-institutionalized elders in Galle, Sri Lanka, and to compare the participants' contentment with basic facilities available to them in their residencies between the two groups. A comparative cross-sectional study was conducted with 70 non-institutionalized and 70 institutionalized elders in the Galle District using the convenience sampling method. WHOQoL – BREF (total score and domain scores) were used to measure QoL. Analysis was done using an independent t-test and descriptive statistics. The mean age of the participants was 73.5 years (SD =7.9 years). The institutionalized elders were older and poorer than non-institutionalized elders. The mean total QoL score was higher among non-institutionalized elders compared to institutionalized elders (66.4 verses 59.3, $p < 0.05$) Participants in both groups were highly satisfied (scores ≥ 8 in a 1-10 scale) with toilet, sleeping, religious, and day-to-day personal activity facilities available for them in their residencies. Both groups were moderately satisfied (scores 5 – 7 in a 1-10 scale) with the social interaction facilities available to them. Non-institutionalized elders seem to have a somewhat better QoL than institutionalized elders. Age and poverty may be the decisive factors that contribute to the QoL of elders. For both groups, improvements in social interactions may contribute to enhancing their QoL.

Keywords: *quality of life, institutions, non-institutions, elders, Galle, Sri Lanka*

Knowledge and Practices Regarding Antibiotics and Antibiotic Resistance of Mothers with Pre-school Children in Selected Child Welfare Clinics of Piliyandala MOH area

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Antibiotic resistance is now deemed a global crisis. The misuse of antibiotics is the main reason which causes antibiotic resistance. Mothers play an important role in the proper usage of antibiotics for their children during bouts of illness. This descriptive cross-sectional study aimed to assess the knowledge and practices regarding the usage of antibiotics and antibiotic resistance among mothers with preschool children, attending selected Child Welfare Clinics in the Piliyandala MOH area, and to find out the association between knowledge and practices regarding antibiotic usage and antibiotic resistance with their level of education. Data was collected from 255 mothers using a pretested interviewer-administered questionnaire. Analysis revealed that majority have heard the word antibiotics (n = 173, 67.84%) and few of them (n = 52, 20.39%) have heard about antibiotic resistance. Most of the participants (52%) did not know that antibiotic misuse would lead to antibiotic resistance. The assessment of knowledge revealed that approximately two-thirds (69.41%) of respondents had a poor level of knowledge. Meanwhile, there were only 23.92% and 6.67% of participants with moderate and high levels of knowledge respectively. Also, it revealed that a majority of participants (95%) had bad practices. Furthermore, it revealed a significant association between the level of education with the level of knowledge (p < 0.001) and practices (p < 0.01) regarding antibiotic usage and antibiotic resistance. It was concluded that most mothers had poor knowledge and practice regarding antibiotic usage and antibiotic resistance. Educating the public is required to remedy this situation.

Keywords: *antibiotic resistance, antibiotic usage, mothers' knowledge and practices*

Knowledge, Attitudes, and Practices Regarding Secondhand Smoking among Pregnant Mothers in Selected Peri-urban Areas in Colombo District

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Second-hand smoke (SHS) during pregnancy is a well-known risk factor for adverse birth outcomes. This descriptive cross-sectional study was conducted to assess the level of SHS exposure and knowledge, attitude, and practices of SHS among pregnant mothers. 375 pregnant mothers (first trimester) were systematically selected from the selected peri-urban areas in the Colombo District. Data was collected through an interview administered questionnaire. According to the findings, the majority of the women who took part in this study were between the ages of 25 and 34 (n=239, 62.2%) and were G2 mothers (n=146, 38.95%). Most of the participants were educated up to Advanced Level (n=131,34.9%) and were housewives (n=173, 44.9%). 59% (n=227) of women were exposed to SHS during pregnancy, with the majority of them being exposed at home (n=100, 26.6%) and this is a significantly higher exposure compared to the exposure level from outdoor (shops, workplace, on the transport, other) (p<0.05). The mean knowledge level was 4.78±2.16(SD) and was in the satisfactory region of the 10-point scale. The mean attitude level was 4.78±1.79(SD) which was also in the satisfactory region of the 10-point scale. The mean level of practice was 0.74±3.10(SD) which was in the poor spectrum of the 10-pointscale. According to the findings of this study, more than half of the pregnant women who were exposed to SHS were exposed at home. The degree of awareness and attitude was satisfactory, and urgent community measures are required to minimize the harm of SHS in pregnancy.

Keywords: *Second-hand smoking (SHS), Pregnant mothers, Peri-urban areas.*

An Analysis of Changes in Patterns of Substance Usage among Substance Users during the COVID-19 Pandemic Period in Gampaha, Ampara, Mannar, Anuradhapura, Badulla, Vavuniya and Kandy Districts, Sri Lanka

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The COVID-19 pandemic is affecting people, including substance users' patterns of usage and associated complications. The objective of this study was to assess the changes in the pattern of substance usage in a selected group of tobacco, alcohol, and other substance users, such as heroin and cannabis. Mixed research methods were used to assess the pre and post-status. The pre-status is defined as the period before the 1st COVID-19 patient was reported in Sri Lanka and the post-status is defined as 02 months after the lockdown period. A sample of 78 male substance users of age between 18 – 60 years was recruited for the survey using a purposive sampling method. Semi-structured interviews were conducted through telephone calls. The participants were categorized into two groups based on the frequency of usage of a particular substance. The first group consisted of participants who use a particular substance 5 or more than 5 days per week (n=43). Among them, 74.41% were tobacco users, 67.44% were alcohol users and 4.6% were other substance users. During this pandemic period, 11.62% of participants have stopped, 58.13% have reduced and 27.90% have continued the usage as before. The second group consisted of the participants who used a substance up to 4 days per week (n=35). Among them 37.14% were tobacco users, 85.71% were alcohol users and 28.57% were other substance users. During this pandemic period 94.28% have reduced the usage and 8.57% have continued as before. The factors responsible for the reduction and quitting of substance usage included: reduction of peer influence, limited availability, low income, and fear of being contracted with COVID-19 and staying safe at home during this period. As per the results of the survey, the majority of participants in selected districts have shown a reduction in substance used during the pandemic period.

Keywords: *Substance use, Pandemic period, Factors*

Adolescent Mental Wellbeing, Substance Use and Chronic Pain: A Population-Based Cross-Sectional Study in Vavuniya District of Sri Lanka

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Adolescent mental health is under-investigated, especially in low-and middle-income countries. Mental health disorders that develop during adolescence often lead to behavioural problems, risky decision making, and may adversely impacted educational attainment and the establishment of social relationships. Adolescents experiencing psychological trauma, including those who develop post-traumatic stress disorder, also have an increased risk of substance use. The aim of this study was to estimate the prevalence of selected common mental disorders, hopelessness, chronic pain, and substance use among adolescents in the Vavuniya District, a post-conflict region of Sri Lanka. A population-based cross-sectional study was conducted with 585 adolescents aged 12-19 years. The study received ethical approval. Moderate to severe depression was present in 23(3.9%) participants, while the lifetime prevalence of any substance use was 41(7%). Chronic pain was reported by 135(23.1%) adolescents and 52(8.9%) had dropped out of school. Depression, substance use, and dropping out of school were prevalent in the age category of 15-19 years. The association between chronic pain and depression was significant ($p<0.001$). The most significant findings of the study were the low prevalence of moderate to severe hopelessness; 8(5.2%) among participants aged 17 years and above, and the low prevalence of depression;23(3.9%). Dropping out of school, depression, hopelessness, and substance use constitute small percentages in the study. The low prevalence of hopelessness and depression highlights the fact that these adolescents are resilient in the face of adversity. However, the prevalence of school dropouts also calls for a focus on academic attainment to promote better educational outcomes.

Keywords: *adolescents, substance use, school dropouts, depression*

Effect of Smoking Cessation Interventions on Adult Tobacco Smokers in Colombo District, Sri Lanka

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Effective strategies are needed to improve the motivation of smokers to quit. The aim of the study was to assess the effect of a smoking cessation program among the selected smokers who live in peri-urban areas of the Colombo district. 180 smokers with a median age of 39.0 ± 18.75 (IQR)(years), were selected for a prospective follow-up from a previously recruited pool of 360 smokers. Counselling interventions were applied at two levels based on the WHO 5A and 5R counselling protocol. Previously analysed cardio-pulmonary test results were used to create a strong motivation to quit. Compliance for the first intervention was assessed after one week. Second interventions were delivered on the day of the first follow-up and compliance was re-assessed after one month. Smoking status was confirmed with the assessment of a smoking biomarker of carbon monoxide e-CO (ppm) and carboxyhaemoglobin (COHb%) with Smokerlyzer® (Bedfont Scientific, UK). The pre-intervention values were daily consumption of cigarettes 5.73 ± 4.88 (SD) sticks; e-CO 7.0 ± 8.0 (IQR)(ppm), COHb 1.75 ± 1.44 (IQR) (%). Among the selected 180 smokers, 156 (86.7%) attended the first follow-up. There was a significant difference of all smoking variables at one week after the counselling compared to the baseline values; the number of cigarettes, ($Z = -10.644$, $p < 0.001$), e-CO ($Z = -9.626$, $p < 0.001$), and COHb% ($Z = -9.466$, $p < 0.001$). Changes in the smoking variables between baseline and one month were assessed. Out of the 156 smokers who participated in the week one follow-up, 113 (72.5%) males presented for follow-up conducted one month later. There was a significant difference in all smoking variables at one month following the cessation interventions when compared to the baseline values, including the number of cigarettes ($Z = -9.077$, $p < 0.001$), CO ($Z = -8.707$, $p < 0.001$), and COHb% ($Z = -8.574$, $p < 0.001$). In conclusion, compliance with smoking cessation can be achieved with proper education, motivation, and follow-up.

Keywords: *exhaled carbon monoxide, carboxyhaemoglobin, smoking cessation*

POSTER PRESENTATIONS



Critical Results Management Practices of the Medical Laboratory Technologists in the Southern Province, Sri Lanka

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Critical results are laboratory measurements that require urgent clinical action and should be communicated to a clinician urgently. The study aimed to assess the practices of Medical Laboratory Technologists (MLTs) in critical results management in medical laboratories in the Southern Province, Sri Lanka. A descriptive cross-sectional study was conducted. The sample size was calculated, and the purposive sampling technique was adopted to recruit participants for the study. Data collection was conducted using a self-administered, pre-tested questionnaire with the participation of 85 MLTs in Southern province. The questionnaire consisted of questions to gather information on the competency of MLTs, ways of communication, timeliness of reporting, and read back policy and documentation practices. The results were analyzed using SPSS version 21. The majority of the participants were female (74.1%). About 32.9% of the participants were certain that there was a critical result management system in their laboratory, while 42.4% stated that there was no such system in the laboratory. Study participants were categorized based on their practice scores as follows: less than 50-not satisfactory, between 50-75 satisfactory and more than 75-good. The mean (SD) practice score among participants was 43.39(±10.66). There were no statistically significant differences in the practice scores of the MLTs in relation to their gender, age group, or education. The overall practice of MLTs in the Southern Province of Sri Lanka on critical results management is not satisfactory. The results of the study highlight the importance of conducting educational and training programs for MLTs on critical results management in order to improve their practices in the same aspect.

Keywords: *critical results, medical laboratory technologists, practices*

Investigation of *In-vitro* Antibacterial Properties of Human Cerumen of Healthy Individuals Attending the National Hospital of Sri Lanka

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Previous studies have revealed the prevalence of bacterial ear infections is moderately high in developing countries. Since the absence of human cerumen may lead to ear infections according to the literature, it is important to find the antibacterial properties of human cerumen. This study focused on the investigation of *in-vitro* antibacterial properties of human cerumen of healthy individuals attending the ENT clinic, NHSL (National Hospital of Sri Lanka) - Colombo 10 to assess antibacterial activity against *E. coli*, *P. aeruginosa*, and *S. aureus*. An *in-vitro* cross sectional study of healthy individuals, both males and females, of all age groups, without any middle or external ear pathology to study the antibacterial activity using the spread plate count method. A hundred cerumen specimens were collected from healthy individuals and only 44 specimens were sterile and 56 were non-sterile. Sterile cerumen samples were further examined with *E. coli*, *P. aeruginosa* and *S. aureus*, and their inhibitory growth in the presence of human cerumen was observed. The present study revealed that human cerumen showed 93% antibacterial activity against *E. coli*, whereas 89% and 66% were shown against *P. aeruginosa* and *S. aureus* respectively. The current study concluded that human cerumen possesses an antibacterial activity against *S. aureus*, *P. aeruginosa* and *E. coli*.

Keywords: *human cerumen, antibacterial properties, antibacterial activity*

Gender-wise Variation in the Delivered Radiation Dose during Common X-ray Procedures. A Preliminary Study

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The increased radiosensitivity in women compared to men is a greater concern in diagnostic radiology, which uses ionization radiation for the purpose of diagnosis. However, radiation protection authorities, such as the international commission on radiation protection (ICRP) have only focused on the average adult when giving radiation protection recommendations, such as diagnostic reference levels (DRL). The present study aimed to evaluate the gender wise variation in delivered radiation dose during common X-ray projections. The dose area product (DAP) values of six X-ray projections were recorded for 658 adult patients (393 male and 265 female) of same age range of 18 to 83 years who underwent routine X-rays at two hospitals. A gender wise comparison between the resultant average DAP values showed that the females received a higher mean dose than the males during abdomen anteroposterior (AP) (230.0 $\mu\text{Gy.m}^2$), kidney-ureter-bladder (KUB) (323.8 $\mu\text{Gy.m}^2$) and pelvis AP (268.3 $\mu\text{Gy.m}^2$). In addition, males also received higher doses of 124.1 $\mu\text{Gy.m}^2$, 388.0 $\mu\text{Gy.m}^2$ and 16.3 $\mu\text{Gy.m}^2$ respectively for lumbar spine AP, lateral and chest posteroanterior (PA). However, these differences were significant only in chest PA and lumbar spine lateral projections ($P=0.000$ and 0.001). Therefore, the authorities should focus on subpopulations rather than consider an average adult when providing dose recommendations and guidelines on radiation protection. However, in-depth and large-scale studies are required to support the idea of gender-based DRLs in the future.

Keywords: X-ray procedures, radiation dose, gender difference, dose area product, DAP, DRL

Evaluation of *In vitro* Anti-inflammatory Activity of Ethanol and Aqueous Extracts of the Whole Plant of *Cardiospermum Halicacabum*

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Presently, synthetic steroidal and non-steroidal anti-inflammatory drugs (NSAIDs) are used to treat symptoms associated with inflammatory diseases, which can cause severe side effects when used for long-term. Therefore, there is a high demand for novel, potent anti-inflammatory agents with fewer side effects, preferably from plant sources. *Cardiospermum halicacabum* (Walpenala) has been used to treat inflammatory diseases since ancient times in Ayurvedic medicine. This study was aimed to evaluate *in vitro* anti-inflammatory activity of extracts of the whole plant of *C. halicacabum*. The ethanol and aqueous extracts were prepared by the cold maceration method. Both extracts were assessed for their anti-inflammatory activity *in vitro* by the heat-induced ovalbumin denaturation method using diclofenac sodium as the reference drug. The percentage yield of ethanol and aqueous extracts were 15.7% and 10.4% w/w respectively. The results showed that ethanol and aqueous extract at a concentration range of 0.5 – 16 mg/ml and the reference drug diclofenac sodium at a concentration range of 0.05 – 1.6 mg/ml. The ethanol extract showed a moderate anti-inflammatory activity (IC₅₀ at 5157 µg/mL) and the aqueous extract showed a mild anti-inflammatory activity (IC₅₀ at 8121 µg/mL) with reference to standard diclofenac sodium (IC₅₀ at 1922 µg/mL). Ethanol and aqueous extracts showed a statistically significant (p<0.05) positive correlation between concentration and percentage inhibition of protein denaturation. The present study justifies the possibility of application of *C. halicacabum* as an anti-inflammatory agent, though further studies are recommended to be continued to confirm the results and isolate the lead chemical constituents.

Keywords: anti-inflammatory, *Cardiospermum halicacabum*, ovalbumin denaturation

Evidence-Based Intrapartum Care in Vaginal Births: Direct Observations in a Tertiary Care Hospital in Sri Lanka

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Identifying the gaps between evidence-based care and actual intrapartum care has paramount importance in improving maternal and neonatal outcomes at birth. This study aimed to evaluate the current intrapartum practices of a tertiary care hospital in central Sri Lanka, during vaginal births. World Health Organization (WHO) recommendations on intrapartum care for a positive childbirth experience were used as the benchmark for this evaluation. An observational study was carried out at the delivery room of Teaching Hospital, Peradeniya among 196 labouring women who were selected using systematic random sampling. The interventions throughout labour and childbirth were observed and recorded. A non-participant observation checklist covering labour room admission procedures, management of stages of labour, immediate care of the new-born and mother after birth was used for data collection. Data were analysed using SPSS version 22. Providing privacy (33.2%), offering oral fluids (39.3%), opioids for pain relief (48.5%), and measuring maternal vital signs shortly after birth (60.2%) were found to be infrequent. Recommended practices such as encouraging correct pushing techniques, prophylactic uterotonics, skin-to-skin contact, early initiation of breast feeding, and regular assessment of vaginal bleeding were found to be frequent. However, companionship during labour, upright positions during labour, women's choice of birth position and the use of relaxation or manual techniques for pain relief were not observed in hospital intrapartum care. The findings indicate that additional attention and monitoring are required to align current intrapartum care practices with the WHO guidelines. Moreover, adherence to evidence-based intrapartum care should be encouraged among healthcare providers.

Keywords: *evidence-based care, intrapartum care, vaginal birth*

Preparation, Characterization, and *In vitro* Releasing of Microcapsules Loaded with *Bridelia Retusa* Aqueous Bark Extract for Treatment of Rheumatoid Arthritis

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Bridelia retusa (Ketakela) is a plant widely used in the treatment of Rheumatoid Arthritis (RA). Currently, microencapsulation is used to formulate prolonged release dosage forms by using plant extracts. The main objectives of this study were to prepare, characterize and evaluate the *in vitro* release profile of aqueous bark extract (ABE) of *Bridelia retusa* loaded microcapsules for the treatment of RA. In this study, ABE of *Bridelia retusa* was encapsulated into calcium alginate microcapsules by a single emulsion method and the prepared microcapsules were characterized by scanning electron microscopic analysis and Fourier Transform Infra-red (FT-IR) analysis. Also, the encapsulation efficiency was determined in an aqueous medium. The release profile was studied in a phosphate buffered solution and *in vitro* anti-arthritic activity of the microcapsules was evaluated by *in vitro* heat induced protein denaturation method after 2 hours of releasing ABE. Prepared microcapsules had a relatively spherical, rough, and scraggly appearance with an average size of 1 μm . The respective peaks that appeared in the FT-IR revealed the presence of ABE within the microcapsules while confirming the cross-linking of the polymers. Prepared microcapsules showed a maximum encapsulation efficiency of $8.34 \pm 0.01\%$. The cumulative release profile of ABE loaded microcapsules showed a prolonged releasing behaviour for 8 hours and the anti-arthritic activity in terms of percentage inhibition of protein denaturation was $10.09 \pm 0.08\%$ after two hours of release. In conclusion, this study revealed that the slow release of ABE from microcapsules could promote prolonged anti-arthritic activity for the treatment of rheumatoid arthritis.

Keywords: *Bridelia retusa*, aqueous bark extract, microcapsules, rheumatoid arthritis

Comparative Evaluation of Metformin Hydrochloride Brands Available in Sri Lanka

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Metformin, being noteworthy, is used in the management of Type 2 Diabetes. It is available in different brands in Sri Lanka. Several studies have shown that different brands of the drug varied qualities, which could impact the treatment efficacy. This study was conducted to analyse the quantity of different brands of metformin hydrochloride tablets available in the Jaffna municipal area, Sri Lanka. It was a laboratory-based exploratory study conducted in State Pharmaceutical Manufacturing Corporation, Sri Lanka. Based on most available brands at pharmacies in the Jaffna Municipal area, fifteen brands of conventional metformin tablets were selected for this study. They were coded as M₁, M₂, M₃,... M₁₅. The uniformity of weight, hardness, friability, disintegration, uniformity of content, and dissolution tests were performed in accordance with the British Pharmacopoeia (BP). Two out of fifteen brands were locally manufactured, and the remaining were imported. All brands were conformed to BP specifications in uniformity of weight. The hardness test showed optimum withstanding strength in all brands. All brands excluding M₁ (108.95%), M₆ (111.58%), M₇ (94.27%) and M₁₁ (93.91%) were comprised of values falling under monograph specifications (95% -105%) for uniformity of content. Twelve brands satisfied Pharmacopoeia requirements in the friability test, while two brands, M₇ (40.45 min) and M₁₀ (34.5 minutes), failed in the disintegration test. The dissolution of one brand showed the least drug release (61.40%), and the remaining passed the dissolution test. In conclusion, of all the metformin hydrochloride brands, nine brands passed all the official tests according to BP specifications.

Keywords: *metformin, brands, evaluation, quality analysis*

Relationship between Unexplained Infertility and Sedentary Lifestyle among Women in the Urban City of Colombo; Infertile Female vs. Fertile Female

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Infertility is defined as the absence of conception after 12 months of regular, unprotected intercourse. The objective of this study was to identify the relationship between unexplained infertility and sedentary lifestyle behaviour among the young female population in the urban city of Colombo. A case-control study was conducted among 250 women (125-fertile group/125- infertile group) in the age group of 18 – 32, who were clinically diagnosed with infertility and fulfilled the inclusion criteria at Infertility clinics and Gynaecology wards at 3 hospitals in the Colombo district. A convenient sampling method was used to recruit cases and controls upon completion of clinical diagnosis by the Visiting Obstetrician and Gynaecologist. The study tools and measurement tools were an interview-administered female infertility questionnaire form, International Physical Activity Questionnaire (IPAQ), Body Mass Index (BMI), and Skin Fold Thickness (SFT). Significant positive associations ($P < 0.05$) were explored between the obesity category and female infertility. There was a significant influence of over fat (30.4%) level measured using SFT for female infertility. A significant positive correlation ($P < 0.01$) was emphasized between the low level of IPAQ score (36.4%) and female infertility. Women aged ≥ 28 years, sedentary occupations, and age at menarche were found to be associated with infertility ($P < 0.01$). Sedentary lifestyle behaviour among women of reproductive age, living in the urban city of Colombo was found to be associated with female infertility.

Keywords: *unexplained infertility, international physical activity questionnaire, BMI (Body Mass Index)*

Impact of Short-Term Yoga and Mindfulness Based Stress Reduction Programme on Health-Related Quality of Life of Treatment Seeking Patients with Cardiovascular Diseases

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Yoga and Mindfulness-based Stress Reduction (MBSR) are effective in improving Health-related Quality of Life (HRQoL) of patients with cardiovascular diseases (CVDs). The aim of this present study is to assess the impact of yoga and MBSR program on HRQoL of patients with CVDs attending University Hospital-KDU. A Quasi- experiment study was conducted among 80 patients (control group;40, intervention group;40) using a validated interviewer- administered questionnaire to assess the HRQoL as the data collection tool. Anthropometric, clinical, and laboratory investigation data were also collected. The intervention group received a yoga and MBSR program and the control group did not receive the yoga and MBSR Programme. Post-intervention parameters were collected after 8 weeks of the intervention from both groups. An Independent sample t-test was used to assess the mean difference between groups ($p < 0.05$). The Mean (\pm SD) ages of the control and intervention groups were 53.23 (\pm 7.82) and 53.25 (\pm 7.63) years respectively. The mean scores of all three domains of HRQoL of patients in the intervention group were significantly higher compared to the control group at the 8th week of intervention (emotional; $p = 0.041$, physical; $p = 0.034$ and social; $p = 0.049$). Moreover, the mean values of systolic Blood Pressure ($p = 0.003$), mean Arterial Blood Pressure ($p = 0.013$), total cholesterol ($p = 0.002$), triglycerides ($p \leq 0.001$), Low-Density Lipoprotein cholesterol levels ($p = 0.046$) and waist circumference ($p = 0.016$) were also significantly reduced after the intervention. The yoga and MBSR programme significantly improved HRQoL, clinical, anthropometric, and laboratory investigation parameters of treatment -seeking individuals with CVDs.

Keywords: *cardiovascular diseases, yoga, mindfulness-based stress reduction*

Relationship between Postural Balance and Falls in Elderly People in Two Selected Elders' Homes in Colombo District

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Aging is a natural process that results from the impact of the accumulation of various molecular and cellular changes over time at the biological level. This process leads to a gradual reduction in physical health. Falls are considered as one of the geriatric giants experienced by older adults at least once in their elderly stage. Falls occur in the elderly as a result of one or more than one intrinsic risk factor experienced by the elders. Postural balance plays an important role among intrinsic risk factors of falls in the elderly. This study's aim was to identify the association between postural balance and falls among the elderly in Salina Alwis Elders' home and Sahana Udaya Elders' home. A cross-sectional study was conducted under a non-probability convenient sampling method, including 60 elderly people aged 65 years and above who dwelt in the Salina Alwis Elders' home and the Sahana Udaya Elders' home. Postural balance was measured using the Mini Balance Evaluation System Test (Mini- BEST). Falls history was obtained through an interview administrated assessment. Elders who experienced one or more than one fall within the past 6 months were included in the fallers' category. The mean age of the participants was 76.67 ± 6.23 years. The mean and standard deviation of postural balance were 20.88 ± 2.70 . The mean values of postural balance among falls and non - fall groups of elderly were 18.17 and 22.57 respectively. Independent sample t-test showed a significant difference in postural balance ($p= 0.031$) among the falling group of elderly people. The study revealed that deprivation of postural balance affects falls in elderly people.

Keywords: *postural balance, institutionalized elderly, mini-balance evaluation system test*

Differences in BMI, Physical Activity Level and Diet of Healthy People and People with Lower Back Pain

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Lower back pain (LBP) is a major cause of disability worldwide, affecting general wellbeing and performance at work. Several factors are believed to be associated with the incidence of lower back pain. The main objective of this study was to investigate the differences in Body Mass Index (BMI), physical activity level, and diet in people with LBP and healthy people. An analytical observational study was carried out including 50 LBP patients (Cases) and 50 patients without LBP (Controls) from the Department of Neurology and Neurosurgery, University Hospital, Kotelawala Defence University. Demographic data was collected on an assessment form. Measurements and calculations regarding BMI were done according to standard methods. To evaluate activity level, the International Physical Activity Questionnaire was used. Dietary intake was assessed by using a questionnaire made by the members of the research group. All the information on the questionnaires was gathered using an interviewer-administered method. There was a significant difference in BMI between the two groups ($P < 0.05$). There was a significant difference in the weight of the two groups ($P < 0.05$). Most people with LBP have high IPAQ scores, while healthy people have moderate IPAQ scores ($P < 0.05$). There was a significant difference in animal protein intake ($P < 0.05$), sugar intake ($P < 0.05$) and overall quantity of food consumption ($P < 0.05$) between the two groups, where all of the above factors were high in the LBP group. Therefore, it is recommended to consider the above factors when assessing and treating patients with LBP.

Keywords: *BMI, physical activity level, lower back pain, animal proteins, sugar, quantities of food*

Knowledge, Practice and Factors Affecting Healthcare-Associated Infection Control among Intensive Care Nurses at the National Hospital of Sri Lanka Colombo

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Infection control is the discipline concerned with preventing health care associated infections and it can also affect at any time people receiving their medical treatments. Without controlling infections, it may lead to having more antibiotics, investigations, complications, and also it will be a massive additional financial burden to the Government. The aim of this study was to access knowledge, practice and influence factors on the practice of healthcare-associated infection control among clinical nurses in the National Hospital of Sri Lanka (NHSL). A quantitative descriptive cross-sectional study was conducted using a self-administered questionnaire. Conveniently, 149 ICU nurses from the NHSL Colombo participated in this study. The questionnaire was developed by the researcher using the hospital infection control manual (2005), Sri Lanka College of Microbiologists and World Health Organization (WHO) guidelines. The SPSS 25 package chi-square was used to analyse the data. Ethical approval was given by the ethical review committee at NHSL and the International Institute of Health Sciences (IIHS). Out of 149 ICU nurses there were 51.7% (n=77) of respondents who scored above the average level of total knowledge, while 53.7% (n=80) scored below the average level of total practice. There is a positive correlation between knowledge of infection control with age ($p=0.0000$, $r=0.291$), working experience as an ICU nurse ($p=0.0000$, $r=0.356$) while there is no correlation between the level of education and infection control training ($p=0.292$, $r=-0.088$ and $p=0.161$, $r=-0.117$ respectively). Furthermore, there is a positive correlation between practices of infection control with age ($p=0.041$, $r=0.167$), gender ($p=0.020$, $r=-0.190$) and working experience as an ICU nurse ($p=0.016$, $r=0.197$). Findings based on the current study, it can be concluded that in spite of having a good knowledge level regarding infection control, nurses had a fair practice level. Therefore, updating knowledge and practice of nurses through continuing in-service educational programs and conducting evidence-based practical evaluation sessions are needed.

Keywords: *infection control, knowledge, practice*

Evaluation of *In vitro* Anti-acne Activity and Formulation of Anti-acne Cream from Methanolic Extract of *Nymphaea nouchali* Pollens

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Acne vulgaris is a dermatological disorder. Although definite therapeutic agents are using in the treatment, herbal medicines are also still useful in the management of acne. The current study was designed to scientifically evaluate the anti-bacterial activity of *Nymphaea nouchali* pollens against *Staphylococcus aureus* and *Staphylococcus epidermidis*. The anti-bacterial activity of methanolic extract of *N. nouchali* pollens at seven different concentrations (244.14 $\mu\text{g mL}^{-1}$, 488.28 $\mu\text{g mL}^{-1}$, 976.56 $\mu\text{g mL}^{-1}$, 1953.125 $\mu\text{g mL}^{-1}$, 3906.25 $\mu\text{g mL}^{-1}$, 7812.5 $\mu\text{g mL}^{-1}$ and 15625 $\mu\text{g mL}^{-1}$) were evaluated and IC_{50} values of *N. nouchali* pollens were determined. This was regarded as an anti-acne activity. Gentamicin was used as standard. Methanolic extract of *N. nouchali* pollens was incorporated considering the IC_{50} values of five different concentrations with eight different ratios consisting of oil, water, and surfactant to prepare emulsions with plant extract. Creams were prepared based on the most stable ratio for two groups, as non-homogenized and homogenized creams respectively. Creams were tested for anti-acne activity and pharmaceutical acceptance was evaluated by characterization and stability studies. The maximum anti-bacterial activity was observed in *S. aureus* and *S. epidermidis* at a concentration of 15625 $\mu\text{g mL}^{-1}$. The most stable ratio for emulsion with plant extract was 35% w/w oil: 33% w/w water: 32% w/w surfactant. The highest anti-bacterial activity was shown in the homogenized cream with a concentration of 1% w/w. Creams are o/w types and all creams were thermodynamically and kinetically stable for 30 days at room temperature (28 ± 2 °C). Therefore, the results clearly indicate that 1% w/w homogenized cream formulation of *N. nouchali* pollens have a significant ($p < 0.05$) anti-acne activity against *S. aureus* and *S. epidermidis*.

Keywords: anti-acne activity, *Nymphaea nouchali*, cream formulation

Seroprevalence and Associated Factors of Varicella Zoster Virus Infection among the Pregnant Mothers Attending to Antenatal Clinic, Teaching Hospital Jaffna

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Varicella Zoster Virus infection is a vaccine preventable disease that leads to adverse outcomes for both mother and child if infected during pregnancy. The purpose of the current study was to determine the seroprevalence and associated factors of Varicella Zoster Virus infection among the pregnant mothers attending the antenatal clinic, Teaching Hospital Jaffna. This is a descriptive cross-sectional study. Blood samples were collected, and associated factors were obtained through an interview-based questionnaire. Seroprevalence for Varicella Zoster Virus IgG antibodies was given as 47.25% from 86 samples out of 182. There was a significant association between clinical variables including self-reported history and self-reported vaccination history. Being a tropical country and without having vaccination programmes for risk groups, the yielded susceptibility rate of 52.75% to Varicella Zoster Virus infection is high. Vulnerable groups for Varicella Zoster Virus infection with adverse effects, including young women, and neonates during birth, should be vaccinated according to appropriately planned and implemented vaccination policies. Further studies need to be performed to confirm seroprevalence and associated factors incorporating a large population.

Keywords: *varicella, seroprevalence, pregnant mothers, associated factors, antenatal, anti VZV IgG*

A Study on the Impact of Pharmacist Intervention in Patient Counselling on Medication Management of Type 2 Diabetes Mellitus

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Patient counselling is an important task to improve medication management in non-communicable diseases. A prospective interventional pre-post study was conducted in the medical clinic at University Hospital- KDU to investigate the impact of pharmacists-led patient counselling on Knowledge, Attitude, and Practice (KAP) based lifestyle changes and treatment in Type 2 Diabetic Mellitus (T2DM) on selected 124 patients, who were randomly divided into test and control groups (n=62 each). Baseline KAPs related to T2DM were first measured using a questionnaire, and two months from the baseline, the test group underwent a pharmacist-led patient-oriented counselling session for 5-10 minutes along with a printed leaflet covering the sections addressed in the questionnaire. After two months from the intervention, both groups (n=52 each) were re-evaluated using the same questionnaire and total KAP scores, Fasting Blood Sugar (FBS) and Body Mass Index (BMI) before and after intervention were compared. The mean Pre-Test-KAP score of 39.11±5.82 of the test group has increased up to 49.02±3.39 (p=0.00; <0.05), showing the intervention was successful. The mean FBS level of the test group (147.58±43.30 mg/dl) at the baseline has shown an improvement (134.13±40.02 mg/dl) too. A significant positive correlation was observed between the baseline knowledge and the educational level (p=0.012; <0.05). However, a significant improvement in BMI was not observed in both the groups following the intervention (P>0.05). Therefore, this study shows that increment in KAP through patient counselling has a positive impact on reducing the FBS level and overall management of T2DM.

Keywords: T2DM, patient counselling, knowledge, attitude, practice, BMI, FBS

***In Vitro* Antimicrobial Activity of Psidium Guajava Leaf Extract against Acne-developing Organisms and Formulation of an Anti-acne Topical Hydrogel**

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Increased production of sebum, hyperproliferation of keratinocytes, and activation of *Propionibacterium acne*, *Staphylococcus aureus* (*S. aureus*), and *Staphylococcus epidermidis* (*S. epidermidis*) cause the formation of acne. It is important to discover new natural substances to overcome treatment failures due to antibiotic resistance and side effects. Therefore, this study was aimed to formulate an herbal anti-acne gel using *Psidium guajava* leaves. Methanolic leaf extract of *P. guajava* was used. The antibacterial activity of leaves of *P. guajava* was investigated using the Agar well diffusion method. A stable gel base was developed following the method of Nawarathne et al., 2019. Three types of gels (G96000, G48000 and G24000) were prepared by incorporating the leaf extract into the gel base based on the suitable concentrations of leaf extract. The antibacterial activity of the herbal gels was evaluated using the Agar well diffusion method. Stability tests and characteristic features of gel preparations were tested over three months. As per the results, leaves of *P. guajava* exhibited a significant positive correlation between log concentrations and inhibition zone diameters of leaf extract ($p < 0.05$) against *S. aureus* and *S. epidermidis*. G48000 mono herbal gel was stable throughout three months among the above three mono gels. G48000 mono herbal gel showed excellent physicochemical properties, stability, and antibacterial effects compared to the G96000 and G24000 mono herbal gels. These findings may create a new dimension for treating acne using Sri Lankan traditional medicine.

Keywords: *Psidium guajava*, anti-microbial activity, gel

Health Related Quality of Life of the Diabetic Patients Attending a Tertiary Care Hospital in Central Province of Sri Lanka

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Health-related quality of life (HRQoL) is understood as the individual perception of health in the context of the culture and value system in which they live and in relation to their goals, expectations, and concerns. The main objective of this study was to measure the HRQoL of the diabetic patients attending a National Hospital in Sri Lanka. A descriptive cross-sectional study was conducted among 395 diabetic patients attended the National hospital- Kandy. RAND SF-36 questionnaire was used, which measures HRQoL by giving scores for 8 subscales. In both descriptive and inferential data analysis, ≤ 0.05 p value was considered as the level of significance. Out of 395 participants, 62.8% were females and 37.2% were males, with a mean age of 56.01 ± 12.77 . The majority of participants (male=79.2%, female=66.1%) reported their health status had worsened or had no change over one year. The total mean score for the SF-36 was 67.07 ± 17.23 . Emotional well-being had the highest mean score (76.56 ± 16.71) and vitality had the lowest mean score (54.5 ± 19.71) among the subscales. Education level ($p < 0.001$), duration of the disease ($p = 0.004$) and monthly income of the patients ($p < 0.001$) were significantly associated with the total mean score of SF-36. Age ($r = -0.333$, $p < 0.001$) and duration of the disease ($r = -0.170$, $p = 0.001$) were negatively correlated, and education level ($r = 0.2$, $p < 0.001$) and monthly income ($r = 0.204$, $p < 0.001$) were positively correlated with HRQoL. The health related quality of life of the participants is at a good level according to the mean scores for the overall tool and the importance of giving attention to holistic management of diabetes is emphasized.

Keywords: *health-related quality of life, diabetic patients, Sri Lanka*

Comparison of Demographic, Clinical and Maternal Risk Factors between Neonatal Sepsis and Non-sepsis Patients in Colombo South Teaching Hospital Kalubowila and Castle Street Hospital for Women

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Neonatal septicaemia is one of the commonest causes of mortality and morbidity among the neonatal population in the world. Clinical features alone may not be specific for the diagnosis of neonatal sepsis as they may mimic other non-infectious inflammatory conditions. Therefore, the study aimed to differentiate sepsis condition from systemic inflammatory response syndrome. Episodes of sepsis suspected cases in Colombo South Teaching Hospital Kalubowila and Castle Street Hospital for Women were retrospectively reviewed for a one-year period. Out of 219 suspected neonatal sepsis cases, 116 neonates were confirmed as sepsis while 103 neonates were non-sepsis. Demographic and clinical characteristics of the neonate, maternal risk factors for sepsis were descriptively analysed. Further laboratory investigations (CRP, FBC and biochemical investigations) were compared using an independent sample t-test to determine the statistical difference between the two groups. Among the sepsis suspected patients (n=219), 20% of gestational diabetes mellitus, 22% of dribbling and 19% of prenatal steroid exposure were reported as common features. In comparison, a higher proportion of neonates with birth weight < 1 kg (sepsis-10.1%, non-sepsis-1.4%) and preterm delivery <28 weeks (sepsis-9.20%, non-sepsis-0.5%) were identified. Furthermore, 24% of sepsis patients reported their 1st minute APGAR score as <7 and only 8% in the non-sepsis group. According to the t-test results, two haematological indices; monocyte percentage and MCHC level, showed a significant difference between the sepsis and non-sepsis groups (p<0.05). Significantly, lower total and indirect bilirubin levels were observed in the sepsis group (p<0.001) than in non-sepsis group. Low birth weight, preterm delivery and APGAR score may be reliable predictors of neonatal sepsis among the study population.

Keywords: *neonatal sepsis, maternal risk factors, clinical features*

Evaluation of Setup Errors in Three-dimensional Conformal Radiotherapy (3D-CRT) for Pelvic Sites by Using Electronic Portal Imaging Device (EPID)

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The setup error is defined as any deviation between the intended and actual treatment position, and it is determined by measuring the shift of the treatment field position by comparing the treatment image against its reference image. Dose distribution over target volume is heavily dependent on setup margins. It is essential to evaluate setup errors for each linear accelerator to reduce the treatment errors. The aim of this study is to evaluate systematic and random setup errors using EPID of patients with cancer in pelvic region treated by 3D-CRT. 1150 portal images of 115 patients were evaluated in this study and displacements between digitally reconstructed radiograph (DRR) and portal images were measured in the direction of right to lateral, superior to inferior in anteroposterior (AP) images and anterior to posterior, superior to inferior in lateral images by matching rigid bony landmarks. 78.17% of total deviations were less than 0.5 cm in all directions. Systematic errors were 0.242, 0.255, 0.227, 0.220 cm and random errors were 0.404, 0.367, 0.313, 0.337 cm in the direction of right to lateral, superior to inferior in AP images and anterior to posterior, superior to inferior in lateral images. The determined CTV (Clinical Target Volume) - PTV (Planning Target Volume) margin based on the international commission of radiation units and measurements (ICRU) was 0.4711, 0.4465, 0.3870, 0.4026 cm in order to the above directions. The determined setup errors of the present study are well matched with the published setup error data that corresponds to the pelvic radiotherapy practices. 0.5 cm safety margin is suggested for all patients treated with 3D-CRT in the pelvic region, which is recommended according to ICRU.

Keywords: *setup error, 3D-CRT, DRR, portal images, safety margin*

Phytochemical Screening and Antibacterial Activity of *Flemingia vestita* Tuber Skin

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Sohphlang is an important medicinal plant found in the North-Eastern region of India which is traditionally recognized for its anthelmintic properties. This study was aimed to screen the phytochemical constituents and antibacterial activity of the tuber skin extracts of the plant. Whole tubers with intact skin were collected from the North Eastern state of Meghalaya in Shillong city and identified as *Flemingia vestita* in the Department of Botany, St Anthonys College Shillong. Followed by initial sample preparation, solvent extractions of the skin peel were obtained using methanol, acetone, and water. Extracts were concentrated and screened for qualitative phytochemical content using standard methods. The antibacterial activity of methanol tuber skin extract was investigated by Agar well diffusion method at 0.5 mg/ml, 1 mg/ml and 2 mg/ml concentrations, against Gram negative bacteria *Klebsiella pneumoniae*, *Pseudomonas aeruginosa*, *Escherichia coli* and Gram-positive bacteria, *Bacillus subtilis* and *Mycobacterium tuberculosis*. The diameter of the zone of inhibition was measured to determine the antibacterial activity and the obtained data were statistically analysed. Ampicillin was used as a positive control and run in parallel with sterile distilled water and methanol as a negative control. Phytochemical screening of aqueous, methanol and acetone extracts revealed the presence of alkaloids, glycosides, and phenols. The methanol extracts of *Flemingia vestita* were found to be effective at 0.5 mg/ml with a zone of inhibition of 13.3±0.57 mm and 16.3±4.9 mm against *Bacillus subtilis* and *Mycobacterium tuberculosis* respectively. Extracts of *Flemingia vestita* have not shown inhibition zones against *Klebsiella pneumoniae*, *Pseudomonas aeruginosa* and *Escherichia coli*.

Keywords: *Flemingia vestita*, antibacterial activity, phytochemical screening, well diffusion method

A Qualitative Analysis of Community Attitudes and Beliefs towards Youth Suicidal Ideation and Behaviour in the Colombo District

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Suicide is a leading cause of death in young people worldwide, and Sri Lanka still has one of the highest rates of suicide in the world. Many leading approaches to address this issue do not always take into consideration the community's views, attitudes, and beliefs about suicide. The objective of this research was to determine youth and adult attitudes and beliefs towards the impact on the suicidal ideation and behaviour of young people. The qualitative study used semi-structured interviews to elicit the thoughts of 12 participants, comprising youth who were undergraduates, parents of youth, and educators. The participants were Sri Lankan nationals, whose ages ranged from 18- 45 years of age. The transcripts of the audiotapes of the interviews were thematically analysed to identify the attitudes and beliefs regarding youth suicide. Several themes were identified, including three Superordinate themes as Social Behaviour, Sensitivity, and Beliefs, and nine subordinate themes under them. Many participants gave significance to the influence the community has on an individual's mental wellbeing at various social levels. The findings suggest that awareness is vital in addressing the prevention of youth suicide, and awareness programs should address the attitudes and beliefs of the community to promote community engagement in prevention programs. More attention needs to be given to community attributions towards suicide, shared responsibility as a community, and social stigma.

Keywords: *suicide, youth, mental health, awareness, stigma, social responsibility, suicide prevention*

Development of Predictive Model to Identify Neonatal Sepsis in Colombo South Teaching Hospital Kalubowila and Castle Street Hospital for Women

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Neonatal sepsis is a life-threatening illness caused by the blood invasion of microorganisms within the first 28 days of life. As the signs and symptoms of neonatal sepsis are non-specific, and early diagnosis and prompt treatment remain a challenge. Episodes of sepsis suspected cases in Colombo South Teaching Hospital Kalubowila and Castle Street Hospital for Women were retrospectively reviewed during the period of 1st January to 31st December 2020. Two hundred and nineteen suspected neonatal sepsis cases were recruited and 116 were confirmed as sepsis and 103 as non-sepsis. Demographic, clinical characteristics of the neonate and laboratory investigations (CRP, FBC and biochemical investigations) were collected from all suspected cases (n=219). The mean values of scale parameters were compared within study groups using an independent sample t-test. The associations among the study groups were analysed using the cross tab chi-square test. The Backward: LR binary logistic regression model was developed to determine a prediction model for the sepsis diagnosis. The parameters which showed a significant difference between sepsis and non-sepsis (Total and indirect bilirubin levels, monocyte %, MCHC; p<0.05) and significantly associated parameters with neonatal sepsis (gestational age, birth weight, APGAR 1st min, APGAR 5th min, APGAR 10th min and CRP value of the day before the blood culture taken; p<0.05) were combinedly analysed in a logistic regression model. The model was statistically significant (p<0.001, correct classification 69.2%) and gestational age (<28 week), APGAR score less than 7 at 5 minutes, CRP values greater than 5 of the day before the blood culture was taken and monocyte percentage of blood were identified as the predictors of neonatal sepsis.

Keywords: *neonatal sepsis, CRP, predictive model*

An Objective Assessment of Knee Jerk Reflex Using a Fibre Optic Goniometer in Professional Rugby Players

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Rugby is identified as a high-intensity team sport that is played professionally worldwide. It is a contact and collision game that may result in the sudden application of forces on lower limb muscles which may excessively stretch them unless an immediate reflex contraction of the muscle occurs. This study aimed to assess the knee jerk reflex variables of professional rugby players. Knee jerk variables (latency, peak time, total duration, and angle) of national level rugby players were assessed using a fibre optic goniometer. The angle was measured by a bipolar joint angle sensor in the fibre optic goniometer. An electronic tendon hammer was used to bring about the knee jerk. These instruments were connected to a data acquisition equipment (Power Lab 26T). Data were recorded on LabChart 8 software running on a computer connected to the Power Lab 26T equipment. The mean (SD) of age, height, weight and Body Mass Index (BMI) were 27.4 (3.9) years, 1.72 (0.07) m, 83.4 (14) kg and 27.8 (4.3), respectively (n=59). There is no correlation between BMI and knee jerk reflex parameters ($P > 0.05$ for all parameters, Pearson correlation). Knee jerk parameters from the left and right sides did not show a statistically significant difference ($p > 0.05$, paired t-test or Wilcoxon Ranked Sum). Similarly, there was no statistically significant difference between the data from the dominant side and the non-dominant side. Knee jerk parameters of rugby players can be assessed objectively using a fibre optic electronic goniometer and an electronic tendon hammer coupled with data acquisition hardware and software.

Keywords: *fibre optic, knee jerk, rugby players*

Effect of Gym Training and Cycling on Albuminuria among Gym Trainees and Professional Cyclists

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Testing for the effects of physical activities on the health condition of athletes is important. This study aims at studying the effect of cycling and gym training on albuminuria. Thirty gym-trainees in the Gampaha division and 12 cyclists from Naval Base-Welisara were selected using proportionate stratified random sampling, and total population sampling respectively. Urine Albumin to Creatinine Ratio (ACR) was used to assess the albuminuria of both groups before and after training. Workout intensity was measured by calculations done using post-training pulse rate. Hydration level was measured using bodyweight loss, water intake and urine volume passed. A paired t-test was used to test the effect of gym-training and cycling on albuminuria. Pearson correlation test was performed to identify the relationship of ACR difference between the intensity of the training and sweating rate. Moreover, the relationship between the pre- and post-session ACR was also assessed. A Mann-Whitney test was performed to compare the post-session ACR of gym trainees and cyclists. There was a significant difference between pre-session and post-session ACR for both cyclists and gym trainees. There was a positive correlation between the ACR difference and the intensity in both groups. There was no significant relationship between the sweating rate and ACR difference in both groups. There was a positive relationship between pre-session and post-session ACR levels. According to albuminuria assessing criteria, gym trainees indicated a higher elevation of post-session ACR (micro-albuminuria) than cyclists (normal).

Keywords: *ACR, gym training, cycling*

Factors Associated with Early Post-Partum Haemorrhage among Mothers during Postpartum Period at Castle Street Hospital for Women in Colombo, Sri Lanka

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Early Post-Partum Hemorrhage (early PPH) is the leading cause of maternal mortality worldwide, where nearly one-quarter of all maternal deaths in most low-income countries. The study aimed to assess the factors associated with early postpartum hemorrhage among mothers during the postpartum period at Castle Street Hospital for Women. A retrospective Cohort Study was conducted among a sample of 300 mothers in the post-partum period to identify and evaluate the risk factors for early PPH at Castle Street Hospital for Women in Sri Lanka. Data was collected using a systematic sampling method and extracted from the delivery records during the 2017 and 2018 years into a data extraction sheet. It consisted of, Part A- Demographic data, Part B - Current antenatal and obstetric history, Part C - Past obstetric history, Part D - Past medical and surgical history, Part E - History of current delivery. Data were analyzed using SPSS 23 version in percentages and Chi square. The mean age of the sample was 30.39±5.17 years. The majority, 39.9% of mothers, were educated up to secondary level and 33% of mothers were "O positive" in the blood group. Among the sample anemia, diabetes, hypertension, heart disease, renal diseases, and hyperthyroidism were presented respectively 12.0%, 15.3%, 11.0%, 1.0%, 0.7%, and 4.3%. In conclusion, the identified risk factors for early PPH have shown a significant association with anemia, diabetes hypertension (p=0.001) and hyperthyroidism (p=0.009) conditions of the mothers' method of delivery (p=0.001), duration of labour in normal vaginal delivery (p=0.001), vaginal tears (p=0.001), retained placenta (0.001), and prostaglandin administration (p=0.001).

Keywords: *risk factors, early postpartum haemorrhage*

Participation in Strength Training Activities and Perceived Benefits among Female Undergraduates

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The functional and physiologic adaptations of the body in response to strength training (ST) are of greater importance in the management of a healthy and fit lifestyle. Even though these adaptations are similar among women and men, sex and age differences still exist in the participation of ST. Especially among the undergraduate population, a decline in participation in ST, despite the perceived benefits and importance, is observed worldwide. Therefore, this study aimed to compare the participation in ST activities with the perceived benefits and importance of ST activities among female undergraduates. Female undergraduates (n=192) of Faculty of Science, University of Colombo were randomly selected to conduct this descriptive cross-sectional study. An interviewer administered questionnaire was used to collect data about the participation in ST, perceived importance, and perception of benefits of ST activities. The mean age of the participants was 22.66. The majority (89.1%; n= 171) were not ST participants, but 87.5% (n= 168) perceived ST as an important activity. More than half of the undergraduates in ST (52.3%, n=11) and 43.8% in non-ST group (n=75) perceived health benefits as the most important benefit. A Similar percentage of students perceived improving body image as the second most important benefit (ST- 23.8%, n=5; non-ST- 25.7%, n=44). Perceived benefits significantly varied among ST and non-ST groups according to Fisher's exact test (p<0.005). However, the perceived importance of ST did not significantly vary between the two groups. Participation in ST among female undergraduates is very low even though most students identified the benefits and importance. Further research should be conducted to identify the causes of the lack of participation in ST in spite of the available resources.

Keywords: *strength training, female undergraduates, benefits*

Awareness and Attitudes of Older Adults in Gampaha District, Sri Lanka towards the Practice of Donning Facemasks during the COVID-19 Pandemic

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The increase in the number of patients with COVID-19 has led to the public donning facemasks. The aged population is more prone to suffer from severe complications due to COVID-19. As a country with a rapidly ageing population, this study was carried out among older adults in Gampaha District to assess the awareness, attitude, and practice of donning facemasks during the COVID-19 pandemic. A descriptive, cross-sectional research design was used. Data collection was done using a self-administered questionnaire among a conveniently selected 100 older adults residing in Gampaha District. The collected data was descriptively analysed using the SPSS software. The participants have completed secondary education level as their highest educational qualification (34%). The results indicate that most were aware of the occurring pandemic (92%) and that wearing a mask covering the nose and mouth is one of the most effective preventative methods (83.5%). Although, all participants stated that they wore a facemask when leaving home, 31% declared that it was due to government regulation. Furthermore, 63.6% mentioned that a facemask is burdensome as they experience breathing difficulties (73.9%) and stated that purchasing a facemask is a financial burden (8.7%). The study results pointed out that participants were aware of the pandemic and the most effective preventative methods. All participants stated that they wore a facemask when leaving home, facing financial burdens and/or breathing difficulties.

Keywords: *attitude, awareness, COVID-19, mask, pandemic*

Translation and Validation of the Child Feeding Questionnaire by Birch et al., 2001 to Develop a Sinhala Version

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The high prevalence of obesity, as well as growth failure among children, is of great concern, especially in developing countries. Environmental factors, especially familial factors, have a strong influence on the food intake of preschool-aged children, and this has led to the development of psychometric scales to measure parents' feeding practices. The Child Feeding Questionnaire (CFQ) English version by Birch et al., 2001 is a self-reported measure to assess aspects of child-feeding perceptions, attitudes, and practices of parents of children aged 2-11 years. The aim of this study was translation and validation of Child Feeding Practices Questionnaire (CFQ) for Sinhala speaking parents of preschool-aged children. The systematic method proposed by Beaton et al. 2000 was used for the cross-cultural adaptation of self-reported measures consisting of five stages: forward translation, synthesis of translations, backward translation, expert committee review and pre-testing. The final 31-items scale was used for psychometric evaluation. The questionnaire was pretested on 100, 141 of similar sample of parents of preschool-aged children using a stratified random sampling strategy. The confirmatory factor analysis of the final version revealed a satisfactory level of factor structure (>0.3) and the Cronbach alpha values for the tool as a whole were acceptable: 0.79 (>0.7). The modified CFQ is applicable to use within the Sinhala speaking cultural context as a validated, reliable scale for a more comprehensive understanding of parental feeding practices for preschoolers.

Keywords: *child feeding questionnaire, Sinhala version, preschool aged children*

Birth Weight, Weight Gain and Feeding Pattern as Predictors for the Onset of Obesity in School Children

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Obesity is a global health issue. Early identification is essential to plan interventions and to intervene than to reduce the worsening of obesity and its consequences on the health of individuals. The present study was conducted to identify the age of onset of childhood obesity and the influence of birth weight, weight gain, and feeding patterns as predictors for the onset of obesity among school children living in a suburban area of Sri Lanka. The study population was aged 11-12 years from the Piliyandala Educational Zone. The data was collected from 11–12-year-old school children attending government schools in the Piliyandala Educational Zone using a validated, pre-tested self-administered questionnaire separately for the participant and the guardian and using the Child Health Development Record of the child. For each obese child identified; 2 non-obese children were selected as controls. The results of the present study aligned with the hypothesis that the age of onset of childhood obesity must be within the first two years of the life a child. A total of 130 children (66 males: 64 females) participated in the study. The age of onset of obesity was observed to lie within the first two years of life. Obesity risk was identified as 3-times higher among females who underwent rapid weight gain during their infancy period. Consuming milk prior to breakfast emerged as a risk factor that increases the risk of obesity by three times. The current study found that the drinking before breakfast tends to increase the obesity risk by 3-folds, especially among obese-females. Proper monitoring must be carried out to identify the rapid weight gain, specially within the first 2 years of life. Consumption of a mug of milk before breakfast tends to increase the obesity risk by 3 times. Identification of the confounding factors, proper awareness of the mothers/guardians and effective proper interventions need to be carried out to reduce the obesity risk among school children in the future.

Keywords: *childhood obesity, school children, age of onset, weight gain, feeding pattern, activity level*

Evaluation of Performance Characteristics of an In-house Glucose Reagent Compared to Analyzer Specific Commercial Glucose Reagent

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Blood glucose level is the most frequently analyzed parameter in a routine clinical laboratory in order to assess diabetes mellitus. Currently, commercial reagent kits with high costs are used for this test. However, the same reagent can be prepared in the laboratory at a lower cost. The aim of this study was to examine the performance of an in-house reagent method under standard laboratory conditions with the analyzer specific commercial glucose reagent. An evaluation study was carried out at the Clinical Pathology Laboratory, Teaching Hospital, Karapitiya using 200 randomly selected retained blood samples. Glucose values were determined by in-house glucose reagent and commercial glucose reagent. Correlation and the agreement between the two methods were determined. Accuracy, sensitivity, specificity, precision, and stability was checked for the in-house method. Daily IQC and monthly EQA samples were run to assure precision and accuracy. The results were significantly correlated ($r=0.9993$; $p=0.001$), and the two methods indicated a good agreement with a positive bias of 0.835 ± 0.488 mg/dL in Bland Altman analysis. There was a good agreement between 0-300 mg/dL. At concentrations above 300 mg/dL, a tendency towards increasing scatter was observed, which could be due to the low number of sample size in this range. Accuracy, sensitivity, and specificity were 96.5%, 96.15% and 97.14% respectively. The in-house method was linear up to 1000mg/dL. An intra-assay precision (CV) of 6.88 and 2.38% and an inter-assay precision of 2.21 and 3.34% were obtained for normal and high levels of glucose respectively. The reagent was stable for a period of three months at 2-8°C. The in-house glucose reagent is more cost-effective and possesses similar performance characteristics and good stability, compared to the analyzer specific glucose reagent. Thus, it can be adopted for analysis of plasma glucose in routine laboratory checkups.

Keywords: *glucose, performance characteristics, correlation coefficient*

Level of Knowledge and its Associated Factors among Parents on Cancer, Treatment Methods and Side Effects of Cancer Drugs of Children Attending Oncology Units at Apeksha Hospital Maharagama, Sri Lanka

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Cancer is one of the leading causes of death among children worldwide. Inadequate knowledge of parents contributes to a lower cancer survival rate. This descriptive cross-sectional study assessed the level of knowledge and its associated factors among parents of cancer children on cancer, treatment methods and side effects of cancer drugs at Apeksha hospital in Maharagama, Sri Lanka. Convenience sampling method was used to obtain 384 parents of cancer children from paediatric wards and clinics. A self-administered questionnaire was used to collect data and Pearson correlation, and one-way ANOVA test with Post-Hoc Tukey analysis were done using the SPSS 25 version. Mean±SD total knowledge score of the parents was 6.20±2.704 out of 10. Out of 384, 55%, 27% and 18% of parents had good, average, and poor knowledge respectively towards cancer, treatment methods, and side effects of cancer drugs. The study revealed a statistically significant association between knowledge and mother's age ($p<0.05$), parents' highest level of education ($p<0.001$), parents' occupation ($p<0.001$), family structure ($p<0.05$), number of children ($p<0.001$), duration from diagnosis of cancer ($p<0.001$), monthly family income ($p<0.001$), and smoking by family members at home ($p<0.05$). Out of 384, 72% of the parents knew that hair loss (alopecia) occurs due to chemotherapy. The majority (93.2%) of parents tend to seek information related to childhood cancer and treatment methods from health care professionals. It is recommended to conduct educational sessions for parents who have a lower level of knowledge and who seek information, which will contribute to enhancing the knowledge of paediatric cancer.

Keywords: *knowledge, cancer, treatment methods, children with cancer/paediatric*

Effectiveness of Cardiac Rehabilitation Programme on Cardiovascular Endurance in Patients Attending Cardiology Unit, National Hospital, Sri Lanka

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Cardiovascular disease (CVD) is the leading cause of death in low- and middle-income countries. Cardiovascular diseases caused 34% of total deaths in 2016 in Sri Lanka. Cardiac Rehabilitation (CR) programme is the medically supervised way to achieve significant decreases in mortality and morbidity in CVD patients through a structured exercise programme. The purpose of this study is to evaluate the effectiveness of the CR programme on cardiovascular endurance (CVE) in patients attending the Cardiology unit, National Hospital, Sri Lanka. A Retrospective Study was conducted from 1st of January 2020 to 31st of December 2020 with 89 clinically diagnosed post-op cardiovascular disease patients (Females-19, Males- 67) within the age group of 30 – 70. All the patients were referred to the CR programme at the Cardiology unit, National Hospital, Sri Lanka. CVE was measured by the 6-Minute Walk Test (6-MWT). Measurements of 6-MWT were taken by a qualified physiotherapist of the Cardiology Unit and recorded data of the 6-MWT were used for the study. The distance walked in 6-MWT before attending to the CR programme and after attending the CR programme was compared using a paired sample t test. According to the 6-MWT there was a significant improvement in distances walked before and after attending the CR programme ($p < 0.001$). The study concluded that there is a significant improvement in post-op cardiovascular disease patients' CVE after attending the CR programme, cardiology unit.

Keywords: *cardiac rehabilitation, cardiovascular endurance, 6-minute walk test*

A Critical Review on Pulse Measuring Devices W.S.R. to *Āyurveda Nādi Parikṣā* as a Non-invasive Diagnostic Method

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Nādi Parikṣā is a non-invasive key diagnostic and prognostic method found in *Aṣṭasthāna Parikṣā* in *Āyurveda*, which can be correlated with the palpation component of general patient examination in modern medicine. This review aims at studying the developmental and applicational mechanisms and sample testing methods used in pulse measuring devices in selected studies. This study was done by referring to previous research articles related to developing pulse measuring devices from modern and *Āyurveda* perspectives on ScienceDirect, ResearchGate, PubMed®, Google Scholar, etc. Articles published in peer-reviewed English journals in the past seven years were inclusively selected with specific keywords. After reviewing the articles according to the aforementioned criteria, we obtained the main five pieces of research which were done separately to develop a pulse measuring device with an advancement of previously done experimental research works. Out of those five, two were done in Sri Lanka while the others were in India. From the total, two were designed as doctor wearable devices, and others as patient wearable devices. Sample sizes (n) used to get the results of these researches were different from each other. All focused on selecting a sensor, pre-processing utilizing suitable filters, amplifiers, software, and computational methods. It can be concluded that new technological advancements are needed to develop standard devices at the research-based experimental level and to implement them for distinguishing the health status (*Deha Prakriti*) and the disease status (*Vikriti*) of an individual from these devices.

Keywords: *Āyurveda, Nādi Parikṣā, pulse examination, pulse measuring devices*

Impact of Work-Related Characteristics on the Job Satisfaction of Physiotherapists Working in Government Hospitals in the Western Province, Sri Lanka

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In today's world, physiotherapists are facing many challenges due to the dynamic nature of their working environment. This study aimed to investigate the influence of work-related factors on job satisfaction among government physiotherapists in the Western province, Sri Lanka. A descriptive cross-sectional study was carried out among 135 consented physiotherapists through a self-administered, validated survey questionnaire, adopted from Spector's job satisfaction nine facet scale. A 6-point Likert scale was used to evaluate answers for each facet of job satisfaction. Based on the overall score, job satisfaction was categorized as satisfied (>144), ambivalent (108-144) and dissatisfied (<108). Descriptive statistics and Pearson A Chi-square test were performed using SPSS. The majority of the participants were between 31-40 years of age (50.4%) and females (51.9%). Most of them were degree holders (56.3%) and had 6-10 years of work experience (54.1%). Out of the 135 physiotherapists, 95(70.4%) were working in Teaching Hospitals. However, only 50 (37%) of them were practicing in their preferred clinical area. Although 102 (75.5%) participants were working more than five days per week, most of them (57.8%) were not performing night duties. Eighty-nine (65.9%) participants were engaged in private practice. In the assessment of overall job satisfaction, 39 (28.8%) were satisfied, 85 (62.9%) were ambivalent, and 11 (8.1%) were dissatisfied with their job. A significant association was found between the place of work, involvement in private practice, and job satisfaction ($P < 0.05$). The field of work, working patterns, and night shifts had no significant impact ($P > 0.05$) on the job satisfaction of the physiotherapists.

Keywords: *work-related characteristics, job satisfaction, Sri Lankan physiotherapists*

Effects of Respiratory Muscle Training (RMT) on Ventilatory Parameters and Respiratory Muscle Strength (RMS) in Different Postures of the Rowing Stroke in Professional Male Rowers in Sri Lanka

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Rowing places 'extreme' demands on ventilation due to the cramped body posture during the rowing stroke. The aim of this study was to investigate the effects of a 12-week respiratory muscle training (RMT) program on ventilatory parameters and respiratory muscle strength (RMS) in different postures of the rowing stroke in professional male rowers in Sri Lanka. Twenty national male rowers, aged 20-35 years, were grouped randomly into an experimental (n=11) and a control (n=9) group. Prior to the study, baseline measurements of ventilatory functions (spirometry) and RMS were assessed by a portable spirometer and a handheld mouth pressure meter respectively. Subsequently, rowers in the experimental group were prescribed an RMT program comprising of breathing and abdominal exercises, while the control group was prescribed a general exercise programme for 12 weeks, after which all the above parameters were assessed again. One-way repeated-measures analysis of variance (ANOVA) within factors and post hoc Fisher least-significant-difference (LSD) tests were used to assess respiratory functions in the three different postures. Ventilatory functions and RMS were not statistically significant amongst the different rowing postures ($p>0.05$). Ventilatory functions were observed to be significantly higher in the experimental group than in the control group following the respective training programs ($p<0.05$). The novel RMT program had a beneficial effect on improving the ventilatory functions in the experimental group of the different postures of the rowing stroke.

Keywords: *posture, respiratory muscle training, rowing, ventilatory functions*

Association between Ankle Dorsiflexion and Non-contact Low Back Pain among Adolescent Fast Bowlers in Division 1 Boys' Schools in Colombo

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Despite the popularity of Sri Lankan cricket, there are a drastically low number of studies related to school level fast bowlers. This study aimed to investigate the association of ankle dorsiflexion with non-contact low back pain (LBP) among adolescent fast bowlers aged between 15-19 years at Colombo division 1 boys' schools in Sri Lanka. Eighty-five participants completed the prerequisites and an interviewer-administered questionnaire was used to gather the demographic data regarding general characteristics and the severity of low back pain respectively. Bowlers were prospectively observed throughout the competition period of the 2019 cricket season and the ankle dorsiflexion of both lower limbs was recorded. The Spearman correlation test was used to evaluate the association between ankle dorsiflexion and non-contact low back pain, and the Mann Whitney U test was used to assess the difference between two groups with and without LBP. 43.5% (n=37) of the players were identified as presenting with non-contact LBP. An increase in ankle dorsiflexion of non-dominant side leg was found to be significantly associated with non-contact LBP ($P < 0.05$) while a conflicting result was found for the association of ankle dorsiflexion of dominant side leg with non-contact LBP ($P > 0.05$). There was a significant difference in the ankle dorsiflexion of the non-dominant side leg between the fast bowlers with and without lower back pain. The results concluded that higher ankle dorsiflexion of non-dominant side leg has a crucial role in predisposing a fast bowler to have an increase in non-contact low back pain which occurred due to internal factors.

Keywords: *ankle dorsiflexion, low back pain, non-contact, fast bowlers*

