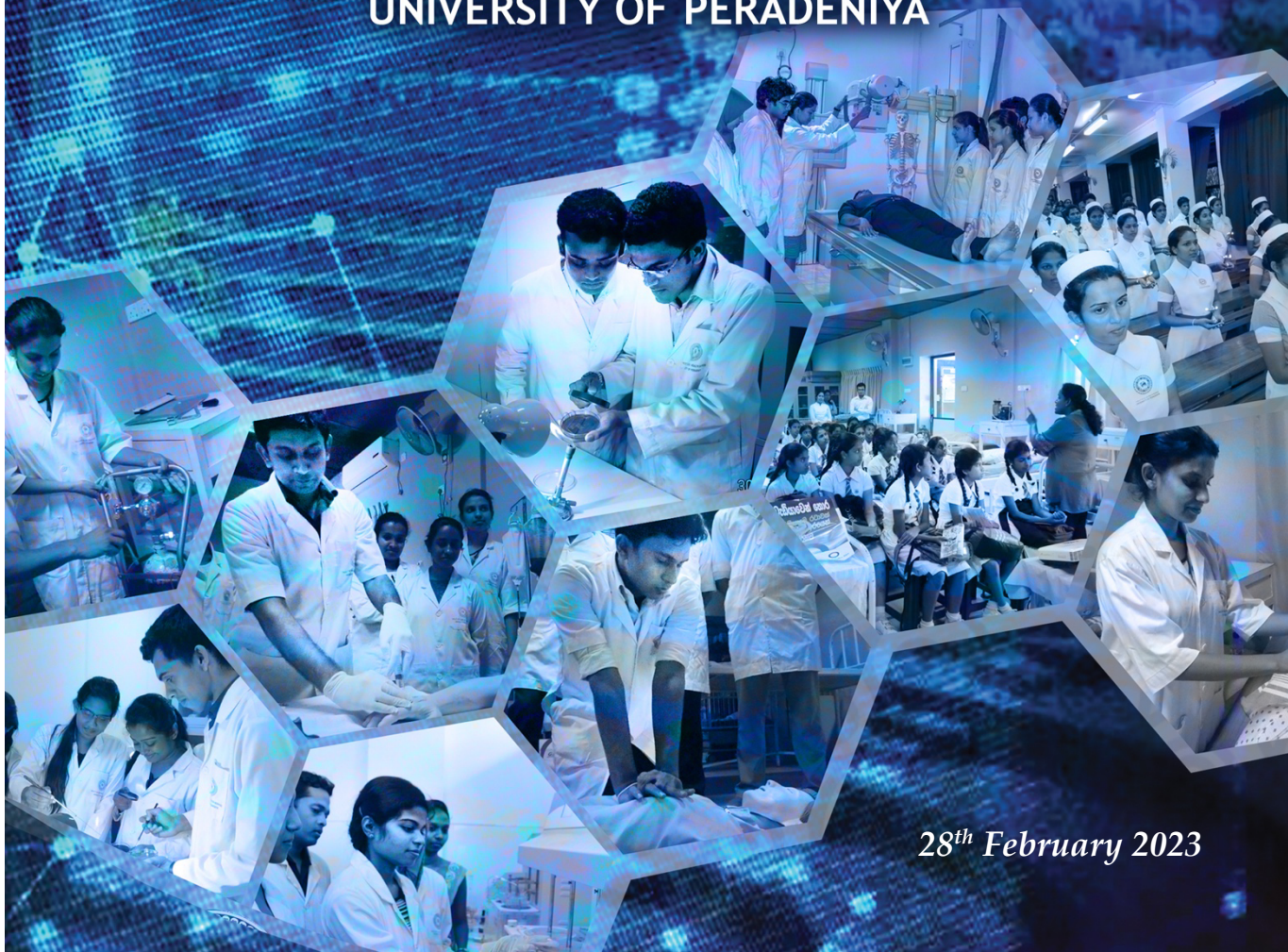




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KNOWLEDGE, ATTITUDE AND PRACTICE OF BREAST SELF-EXAMINATION AMONG TEACHERS IN KANDY EDUCATION ZONE, GANGAWATA KORALE DIVISION

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Breast cancer is the commonest cancer among people in Sri Lanka and as well as globally. The most accessible, inexpensive, and effortless method to detect early signs of breast cancer is Breast Self-Examination (BSE). Although data revealing the knowledge, attitude, and practice of BSE on regional and global levels have become more available in recent years, the extent of knowledge, attitude, and practice of BSE among Sri Lankan teachers have not been well studied. The lack of knowledge limits the ability of public officials, health providers, and researchers to adequately address and take remedial measures to this significant health crisis. The objectives of this study were to assess the knowledge, attitude, and practice levels of BSE and to identify the association between participants' characteristics with the knowledge level.

A descriptive cross-sectional study was conducted with the use of a pre-tested self-administered online questionnaire. Using Lwanga-Lemeshow equation, the sample size was calculated. A total of 275 female teachers from the government schools in the Kandy education zone, Gangawata Korale Division were assessed. Statistical analysis was done by the SPSS version 26. The data were interpreted by calculating the frequencies, and non-parametric independent sample tests were used accordingly.

The study included 275 participants. Knowledge and attitudes regarding BSE of the participants were significantly associated with participants' ethnicity, religion, teaching subject/subject stream, residential area, and having a family history of breast cancer. Only one-third of the study participants had a good knowledge regarding BSE. The majority had a good attitude regarding BSE. Even though more than 90% of the study participants had heard about BSE, only 40.7% had practiced it. Though the knowledge level of the participants' regarding BSE is sufficient, there is a lack of practice among them. According to the total score given for the practice of BSE, 43.7% of the participants had good practice while a majority of 56.3% had a poor practice of BSE.

Enabling education of teachers regarding breast cancer and screening in general, breast cancer complications, severity, and early detection strategies should be a priority in current efforts towards the establishment of lifelong habits like practicing BSE routinely.

DEVELOPMENT OF A DEEP LEARNING MODEL FOR THE DETECTION OF MANDIBULAR CANAL ON DENTAL PANORAMIC RADIOGRAPHS IN A SRI LANKAN POPULATION

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Mandibular Canal (MC), a crucial anatomical structure in dental radiography, can be visualised using both Dental Panoramic Radiography (DPR) and Cone-beam Computed Tomography (CBCT). Of the two, DPR plays a vital role in the current Sri Lankan settings owing to the wide availability at a lower cost despite CBCT being superior in image resolution and using technology by default. Hence, a Deep Learning (DL) algorithm was useful for more precise detection with minimum human intervention in this scenario. The approach was made using a Transfer Learning model called Single Shot Multibox Detecto (SSD) on the ResNet50 deep neural network. DPRs from Dental Hospital Peradeniya were acquired during data ingestion. During data engineering, excluding images, converting collected data to JPEG format, selecting images for the study sample, and labelling them using Labellmg 1.8.6, were performed. This dataset was separated for training and testing as 956 and 107 respectively. The pre-trained SSD ResNet50 V1 FPN 640 x 640 model was trained on Google Colab 16 GB RAM, Tesla T4 GPU environment using the training dataset. The optimal hyper-parameters tuned for training were 65 epochs, 0.04 and 0.0103 learning rates at initial and stop. The extracted 214 bounding boxes from testing dataset were confined to a polygonal boundary containing MC. These polygons were fused onto their corresponding original DPRs. Furthermore, detecting the starting and ending points of MC in the testing dataset was done by using the height, width, and x, y coordinates of extracted bounding boxes. Considering a threshold at $\text{IoU} \geq 0.75$, the mean average values of precision, recall, and F1 score acquired were 0.9575, 0.9902, and 0.9736 respectively, which determined satisfactory results. The results concluded the possible use of a DL algorithm in the precise clinical assessment of the MC using DPRs and a further extension of the study is recommended.

KNOWLEDGE, ATTITUDE AND PRACTICES REGARDING NOTIFIABLE DISEASES AMONG NURSING OFFICERS IN SELECTED TERTIARY CARE HOSPITAL IN SRI LANKA

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Any disease that is required by law to be reported to the government authorities is considered a notifiable disease. Sri Lanka's notifiable disease monitoring system is based on inpatient data collection from government hospitals. Objective of the present study was to describe knowledge, attitude and practices regarding the notifiable diseases among nursing officers in a selected tertiary care hospital in Sri Lanka.

A descriptive cross-sectional study using the simple random sampling technique was conducted among 423 nursing officers in National Hospital, Kandy. A self-administered questionnaire including statements with Likert scale responses was used as the study instrument. Statistical analysis was done by the SPSS version 26.

Among 364 study participants, females were predominant (89.8%). Majority of the participants had excellent (58.5%), satisfactory (11.8%) and acceptable (20.1%) knowledge regarding the selection of notifiable diseases. However, the overall knowledge on the notification process was low with 16.0% correctly identifying the time of notification as the point of first clinical suspicion. There was no significant difference in the scores of knowledge with the demographic factors ($p>0.05$). Majority of the participants responded positively for statements regarding attitudes and the majority of them were practicing notification procedures in the wards. Majority agreed (46.2%) and strongly agreed (45.6%) that notification was a main role of the health care workers while a majority often (42.0%) and usually (32.7%) used the notification register in the ward. Study participants suggested in-service programs, updating the knowledge of the staff continuously and introducing computer based notification process for improvement of the notification process.

Good knowledge of notifiable diseases was present among the study participants. However, poor knowledge was observed regarding the notification process while positive attitude and acceptable practice of notification process was observed. Knowledge of notifiable diseases was not significantly associated with any demographic factors.

Key words: Notifiable diseases, Surveillance system, Knowledge, Attitude, Practice

ANTIBACTERIAL ACTIVITY OF *Mikania micrantha* IN COMBINATION WITH SELECTED ANTIBIOTICS AGAINST MULTIDRUG RESISTANT CLINICAL ISOLATES

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This study targeted to address the issues of bacterial resistance and invasive plants by evaluating the antibacterial activity of the invasive plant *Mikania micrantha* in combination with common antibiotics. Organic and aqueous plant extracts of *M. micrantha* (dry leaf powder) were prepared by bottle shaker method using 50% methanol in dichloromethane and distilled water, respectively. Then, the extracts were concentrated by rotary evaporation and freeze-drying. The plant extracts were screened for antibacterial activity against five multidrug-resistant (MDR) bacteria, *Pseudomonas aeruginosa*, *Acinetobacter* spp., *Escherichia coli*, *Klebsiella pneumoniae* and methicillin-resistant *Staphylococcus aureus* (MRSA) and five relevant standard strains using disc diffusion assay (only for aqueous extract) and micro-broth dilution method (for both aqueous and organic extracts). The combined effect of the aqueous extract and each of ciprofloxacin, gentamicin, and oxacillin on each of the bacterial strains was investigated using Checkerboard method. None of the bacterial strains were inhibited by the aqueous extract in the disc diffusion assay. The results of the micro-broth dilution assay revealed that the minimum inhibitory concentration (MIC) values of the aqueous extract and the organic extract exceeded 50 mg/L and 5 mg/L, respectively, for all the bacterial strains. Combination studies revealed a possible inhibition of ciprofloxacin and gentamicin by the aqueous extract. For example, in *Pseudomonas aeruginosa*, gentamicin alone gave a MIC of 0.5 mg/L, but when combined with the aqueous extract (10 mg/mL) a higher MIC value (4 mg/L) was observed. The study also revealed that the extracts had no antibacterial activity at the concentrations tested. This would help to focus on other parts of the same plant and other invasive plants that have antibacterial activity at low concentrations, for the development of novel antibiotics against MDR microorganisms.

Key words: Multidrug resistance, invasive plants, antibacterial activity, antibiotics, *Mikania micrantha*

PREVALENCE AND TYPE OF ANAEMIA AMONG ADULT ICU PATIENTS AT TEACHING HOSPITAL PERADENIYA, SRI LANKA

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Anaemia is a significant health condition among patients in Intensive Care Units (ICU). It is multifactorial in origin. This study was conducted with the aim of determining the prevalence, common types and causes of anaemia on admission to the ICU, Teaching Hospital Peradeniya.

We performed a prospective, observational study of 95 patients admitted to the adult ICU of Teaching Hospital Peradeniya between July-September, 2022. The level of haemoglobin, type of anaemia, common causes of anaemia on admission and over a seven day period of ICU stay were evaluated using the data collected from bed head tickets and full blood count reports.

Forty seven percent of patients were males and 53% were females. The prevalence of anaemia among adult ICU patients on admission was about 79.01%. The common cause of anaemia on admission was hemorrhage due to surgery and trauma (13%). Chronic diseases (11%) and drug induced anaemia (3%) were the other causes. Patients had microcytic hypochromic anaemia (40.81%), normocytic normochromic anaemia (26.53%), dimorphic anaemia (16.33%), macrocytic normochromic anaemia (10.20%) and macrocytic hyper chromic anaemia (6.12%).

Moreover, 77.42% of patients developed anaemia during their ICU stay. In males and females, the average drop of haemoglobin during 7 days of ICU stay was about 0.04 g/dl and 0.16 g/dl respectively. The average blood volume collected from males was 112.45 ml and females was about 112.36 ml. Full blood count evaluation demonstrated the types of anaemia as microcytic hypochromic anaemia (39.58%), normocytic normochromic anaemia (25.00%), dimorphic anaemia (18.75%), macrocytic normochromic anaemia (10.41%) and macrocytic hyper chromic anaemia (6.25%) in ICU patients.

The prevalence of anaemia was 79.01% on admission and 77.42% developed anaemia during the ICU stay. Majority had microcytic hypochromic anaemia. The commonest cause of anaemia on admission and during ICU stay was hemorrhage due to surgery and trauma.

Key words - Anemia, Prevalence, Critically ill patients, Intensive care units, Haemoglobin

COMPARISON OF SHEEP BLOOD AGAR AND HUMAN BLOOD AGAR FOR ISOLATION AND IDENTIFICATION OF PNEUMOCOCCAL STRAINS

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Streptococcus pneumoniae is a causative agent for invasive diseases. Conventional culture-based method using 5% sheep blood agar (SBA) is recommended for the diagnosis. Due to the lack of reliable sources of blood, human blood agar (HBA) is used in many developing countries. Thus, it is important to assess the possible impact of this on isolation and identification of pneumococci.

Four different strains of *S. pneumoniae*, each from the five commonest serotypes found in Sri Lanka (Serotypes 19F, 6B, 6A, 14 and 23F) and *S. pneumoniae* ATCC 49619 were used in the study. Colony sizes of the isolates were measured in SBA and HBA. Colony counts were obtained in 0.5 McFarland standard, 10⁻¹, 10⁻², 10⁻³, and 10⁻⁴ dilutions. Antibiotic sensitivity test was performed for erythromycin, tetracycline, and levofloxacin using the CLSI disc diffusion method. MIC for penicillin and cefotaxime were tested by micro broth dilution method.

Colony sizes were smaller on HBA. Alpha (α) hemolysis was clearly observable in SBA. In higher dilutions, number of colonies on SBA was higher than on HBA. Mean optochin zone diameter on HBA and SBA was 17.85 mm and 17.70 mm respectively. Mean zone diameters of ABST were significantly different between two media. MIC₅₀ and MIC₉₀ for penicillin were similar in both media. MIC₅₀ and MIC₉₀ for cefotaxime in human blood included media was 0.5 and 2 µg/ml and in sheep blood included media was 0.75 and 2 µg/ml respectively.

Draughtsman appearance and α hemolysis were obvious on SBA compared to HBA. Therefore, there is a possibility to misidentify pneumococci in mixed cultures on HBA. Isolation of pneumococci is much lesser on HBA when the organisms present in lower concentrations. Human blood agar cannot be recommended to use for the isolation of *S. pneumoniae* from the cultures. Further studies should be done at higher dilutions.

Key words: *Streptococcus pneumoniae*, Sheep blood agar, Human blood agar, Identification, Culture

EFFECTIVENESS OF AN EDUCATIONAL SESSION TO ENHANCE THE KNOWLEDGE AND ATTITUDES REGARDING EPILEPSY AMONG PARENTS OF CHILDREN WITH EPILEPSY ATTENDING THE NEUROLOGY CLINIC, SIRIMAVO BANDARANAYAKE SPECIALIZED CHILDREN'S HOSPITAL, PERADENIYA.

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Epilepsy is an illness of the brain. It is prevalent among Sri Lankan children also. When epilepsy is not under control, both epileptic children and parents are stressed. In such instances, some parents seek alternative treatments which may sometimes aggravate the condition and deteriorate the Quality of Life (QOF) of affected children. The objective of this research was to determine the effectiveness of an educational session in improving knowledge and attitudes regarding epilepsy among parents of children with epilepsy.

A quantitative descriptive survey was conducted among 180 parents of children with epilepsy attending the neurology clinic of SBSCH, Peradeniya. Pre and post-interventional knowledge and attitudes were surveyed using a self-administered questionnaire consisting of questions taken from previously validated questionnaires after performing a pre-test. The educational session consisted of a power-point presentation and a short film about epilepsy created by the Sri Lankan Epilepsy Association. The power-point presentation contained information on the definition, etiology, treatments, misconceptions about epilepsy and responsibility of parents of children with epilepsy. The short film was regarding a true life story of a university student who suffered from epilepsy in his childhood. The results were compared using the paired *t*-test. Statistical analysis was done by the SPSS version 26.0.

Among the 180 participants, the mean age was 37.56 ± 7.113 years. The majority of the participants, ($n=117$, 65%) were females. Most of the participants were Sinhalese ($n=145$, 80.6%). Out of 180 participants, $n=79$ (43.9%) have passed G.C.E. (O/L) while $n=100$ (55.6%) were employed. Mean age of their children was 8.46 ± 4.053 years. Majority of the children $n=98$ (54.4%) were girls. Mean age during the disease diagnosis was 4.417 ± 3.0026 years. Most of the children ($n=69$, 38.3%) had experienced seizure attacks more than once per month. The mean pre-interventional knowledge was 53.73 ± 20.39 and the mean post-interventional knowledge was 57.78 ± 18.36 ($p=0.041$). The mean pre-interventional attitudes was 50.56 ± 18.21 while the mean post-interventional attitudes was 58.50 ± 15.98 ($p<0.001$).

Parental knowledge and attitudes about epilepsy is not at an optimal level in our study population. However, educational sessions could significantly enhance their knowledge and attitudes. Therefore, regular educational interventions are recommended to improve the knowledge and attitudes on epilepsy among parents with epileptic children.

Key Words: Epilepsy, Knowledge, Attitudes, Parents, Children, Health education

IN VITRO ANTICANDIDAL EFFECTS OF A TRADITIONAL POLYHERBAL MOUTHWASH AGAINST *C. albicans* ISOLATED FROM PATIENTS WITH ORAL CANDIDIASIS

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Oral infections caused by *C. albicans* have become a serious health concern in recent years due to the emergence of resistance in *C. albicans* to commonly use antifungal drugs. Therefore, alternative treatment options are being explored throughout the globe to curb the antifungal drug resistance in *C. albicans*. The aim of this study was to evaluate the anticandidal activity of a methanolic extract of a traditional polyherbal mouthwash containing the bark of cinnamon, fruit peel of pomegranate, leaves of jasmine, fruits of cardamom, and flower buds of clove on 10 clinical isolates of *C. albicans* from people with oral candidiasis.

A methanolic extract of a traditional polyherbal mouthwash formulated at the Faculty of Dental Sciences was tested against 10 clinical isolates of *C. albicans*. The organisms were identified using germ tube test and CHROM agar test. Zone of inhibition (ZOI) and minimum inhibitory concentration (MIC) were evaluated using disc diffusion assay and micro broth dilution method respectively, according to the CLSI guidelines. Data analysis was done by one-way ANOVA followed by post hoc Tuckey's test using Graph Pad Prism 9.0.

According to the results of agar disc diffusion assay for the 10 clinical isolates of *C. albicans*, the mean ZOI of the methanolic extract of the tested mouthwash at a concentration of 30 mg/ml was 15.73 ± 4.18 mm. It was not significantly different from that of chlorohexidine mouthwash (16.37 ± 1.23 mm) which is the most frequently prescribed mouthwash in dental clinics ($P < 0.05$). According to the micro broth dilution assay, its MIC was 1 mg/mL for all the clinical isolates.

The methanolic extract of the traditional Sri Lankan mouthwash tested in this study has potent antifungal effects against all 10 clinical isolates of *C. albicans*. This shows the potential of this mouthwash to be used in controlling oral candidiasis.

Key words: Clinical isolates, *Candida albicans*, Oral candidiasis, Mouthwash, Agar disk diffusion assay, Minimum Inhibitory concentration

COMPUTER-AIDED MEASUREMENT OF CANAL BODY RATIO IN THE LUMBAR VERTEBRAE AMONG THE SRI LANKAN POPULATION

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Canal body ratio (CBR) is the ratio between the diameters of the bony spinal canal and the vertebral body. Evaluation of CBR is considered a key method to assess the condition of spinal stenosis which is the narrowing of the spinal canal. This study aimed to propose a computer-aided method to measure the average CBR of the lumbar vertebrae among the Sri Lankan population. Abdominal computed tomography (CT) DICOM images of 110 patients (39 females and 71 males) were collected based on specific selection criteria using an interviewer-administered questionnaire. In the selection criteria, abdomen CT images of patients who are between 25-60 years excluding conditions such as sciatica, lumbar stenosis, focal bony lesion and numbness in the lower limb, trauma or surgery or congenital anomalies of lumbar spine and CT images with artifacts. A computer algorithm was developed using Java language to measure CBR at the mid and lower diameters of lumbar vertebral bodies. For the reliability of the computer-aided measurements, the CBR of each sample was calculated manually using the measurement tools of RadiAnt DICOM Viewer. The average CBR of lumbar vertebrae for the Sri Lankan population using the mid diameter was obtained as 0.56725 ± 0.08544 using the computer-aided method and 0.53723 ± 0.09561 using the manual method with a 95% confidence level. Different values of CBR were obtained for male and female populations. The mean CBR values at lower diameters using computer-aided and manual methods were obtained as 0.57165 ± 0.08198 and 0.51190 ± 0.08055 respectively. To analyse the reliability of the measurements, the concordance correlation coefficient (CCC) was obtained using R software as 0.554. The obtained CCC values indicated that there is a mild agreement between manual and computer-aided measurements. Hence, we believe that the proposed computer algorithm could be useful in assessing the CBR in lumbar vertebrae easily with minimum human intervention.

Key words: Lumbar vertebra, Canal body ratio, Spinal canal, Vertebral body

ASSESSMENT OF THE DISTANCE AND ANGLE BETWEEN THE SUPERIOR MESENTERIC ARTERY AND ABDOMINAL AORTA IN A COHORT OF SRI LANKAN POPULATION USING CONTRAST-ENHANCED COMPUTED TOMOGRAPHY

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Superior mesenteric artery syndrome (SMAS) is a rare disease which occurs when the third portion of the duodenum is trapped between the abdominal aorta (AA) and superior mesenteric artery (SMA). The objectives of this study were to assess the distance and angle between the SMA and AA in a healthy cohort of Sri Lankan population using contrast-enhanced computed tomography (CECT) and to assess their association with the selected demographic factors. One hundred patients aged between 18-80 years (50 men and 50 women) who had been referred for CECT abdominal examinations were included in the study. Using the axial and reconstructed sagittal images in the arterial phase, the aorto-mesenteric distance (AMD) and aorto-mesenteric angle (AMA) were measured at the location where the duodenum crosses. The mean values for AMD and AMA were obtained and compared with the age, gender and Body Mass Index (BMI) of each patient. Age was not categorized into groups while BMI was categorized into four groups. The mean value of AMD was measured as 14.49 ± 7.12 mm and AMA as 57.14 ± 25.65 degrees. No correlation was found in age with either AMD or AMA ($p > 0.05$). There was a significant association between gender and AMD ($p = 0.014$) in which higher AMD was observed in males compared to females. No significant association was observed between gender and AMA ($p > 0.05$). A significant positive correlation was observed between BMI and AMD ($p = 0.01$) and BMI and AMA ($p = 0.026$). In the healthy adolescent population, AMD and AMA measurements showed a positive correlation with BMI and higher values of AMD was observed with increasing BMI. Further, it revealed that higher AMD was observed in males compared to females. CECT can be utilized in combination with other patient-related demographic features (BMI and gender) to evaluate AMD and AMA.

Key words: Contrast-enhanced computed tomography, Superior mesenteric artery, Abdominal aorta, Sri Lankan population, Distance Angle, Assessment

HISTOPATHOLOGICAL FINDINGS OF KIDNEYS OF WILD ELEPHANTS FROM CHRONIC KIDNEY DISEASE OF UNKNOWN AETIOLOGY-ENDEMIC AREAS OF SRI LANKA

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Chronic Kidney Disease is currently one of the important health issues in Sri Lanka as well as globally. A new form has been identified which is called Chronic Kidney Disease of unknown aetiology (CKDu). Furthermore, no study has been done locally or globally to evaluate the renal lesions of animals in CKDu-prevalent geographical areas. This study aimed to identify the renal lesions of wild elephants from CKDu-endemic areas in Sri Lanka, which share the same environment with CKDu patients.

Eighteen (n=18) kidney samples were selected from wild elephants from the CKDu-prevalent areas and served as the test group. Another sixteen (n=16) kidney samples were selected from elephants from non-endemic areas and served as the control group. These samples were received by the Faculty of Veterinary Medicine and Animal Science (FVMAS), UOP from 2010 to 2022 for routine histopathological diagnosis. The kidney sections were fixed in 10% neutral buffered formalin, processed and wax embedded. Wax embedded renal tissues were sectioned at 2 µm. Tissue sections were stained with hematoxylin and eosin for histopathology and with Masson's trichrome to detect collagen depositions. The fibrotic areas in the kidneys were measured using Image-J software. The Mann-Whitney U test was used to compare the fibrosis areas between the two groups.

The glomeruli of control animals showed normal renal architecture. In the test group, tubular and interstitial lesions were notably conspicuous over glomerular lesions. Notable inflammatory cell aggregates were also observed, but it was of varying degrees and mainly consisted of lymphocytes and macrophages. Kidneys of the test group had interstitial fibrosis of varying degrees (16, 88.89%) out of 18 kidney samples. The elephants of the control group showed minimum fibroblast proliferations in the interstitium. Furthermore, it was observed that renal fibrosis was significantly higher in elephants from CKDu-endemic areas (test group) than that of CKDu-non endemic areas (control group).

Elephants from CKDu-endemic areas showed microscopic renal lesions similar to that of human CKDu patients from the same geographic areas. Furthermore, these elephants share the same environment and water sources with human CKDu patients. More than 98% of households in CKDu prevalent districts in Sri Lanka had used groundwater for a minimum of five years as their primary source for the day-to-day purposes. Since wild elephants and CKDu patients in the dry zone are sharing the same environment, there would be a possibility of an environmental factor in the development of CKDu. However, more studies are needed to confirm this hypothesis. The findings of this study will shed some light on the epidemiological studies of CKDu in Sri Lanka.

Key words: Wild elephants, Dry Zone, Histopathology, Human kidneys

PREVALENCE OF *CANDIDA* IN ADOLESCENTS RECEIVING REMOVABLE ORTHODONTIC APPLIANCE THERAPY AT DENTAL TEACHING HOSPITAL, PERADENIYA, SRI LANKA

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Removable orthodontic appliances (ROA) are dental devices, used to correct malocclusions which can act as retentive surfaces to oral microorganisms and change the oral micro flora. *Candida* is a commensal fungus and a potential opportunistic pathogen which can cause life threatening diseases.

Fifty adolescents receiving removable orthodontic appliance therapy were taken as the study subjects and oral rinse samples were collected and cultured on CHROM agar. Statistical analysis was done using SPSS version 25.

Prevalence of *Candida* is 42%. *Candida albicans* was the most frequent isolate (71.43 %). Prevalence of *Candida* infection was 14%. There was no association between duration of removable appliance therapy and *Candida* infection positive cases ($p = 0.126$); gender and the prevalence of *Candida* infection positive cases ($p = 0.100$); and the detergent used for cleaning the device and the positive cases ($p=0.310$).

According to the results of the study by Mahmoudabadi *et al.*, prevalence of *Candida* growth positive cases with upper removable appliance (URA) wearers was 76.5%. A similar finding was reported by Arendorf and Addy that the prevalence of *Candida* in ROA wearers was 73%. Results differ from our results and the reason can be the technique that they have used to collect samples (imprint technique) was differ from our sample collection technique.

The frequency of *Candida* infection in removable orthodontic wearers appears not to be influenced by age, gender, appliance duration and the detergent that they used to clean the appliance. Most frequent isolate among the removable orthodontic appliance wearers were *Candida albicans*.

Key words: *Candida*, Removable orthodontic appliances, Prevalence, Adolescents

AN INVESTIGATION ON ONLINE EDUCATION AMONG PHARMACY UNDERGRADUATES IN SRI LANKA

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Online education is delivered via digital media using electronic tools. The novel Corona virus disease pandemic caused a massive acquisition of online education system worldwide. As a result, online education was heavily absorbed into the pharmacy education in Sri Lanka. This study aimed to investigate perceptions, attitudes, benefits, and barriers regarding online learning among pharmacy undergraduates in Sri Lankan universities. This descriptive study invited all B.Pharm undergraduates (715) from University of Peradeniya (n=110), University of Jaffna (n=210), University of Ruhuna (n=137), University of Sri Jayawardenapura (n=130) and General Sir John Kotelawala Defence University (n=135) to the survey. The data were collected from May to June, 2022 using an online questionnaire. The significance of data was tested using Chi-square test. The response rate was 40.8% (292 participants). Cronbach's alpha value obtained for the questionnaire was 0.895. There was no significant difference ($p > 0.05$) with the perception, attitudes, benefits and barriers regarding online education among participants from first, second, third and fourth years. Considering their perception, most participants reported that online education is user-friendly (62.0%, $p = 0.158$). However, online learning of courses containing practical (73.3%, $p = 0.063$) and clinical components (73.6%, $p = 0.060$) were not preferred by most of the participants. Majority reported several benefits of online learning including ease and quick share of educational material (85.3%, $p = 0.143$), flexibility in time and geographical space (73.3%, $p = 0.159$). Having no electricity (76.7%, $p = 0.065$) and difficulty in wireless signal (63.4%, $p = 0.063$) were identified as the main obstacles. The results indicate that online education has been successfully adapted by most of the participants. However, participants had also experienced obstacles in courses with practical and clinical components. Hence, implementation of a strategic plan with all necessary concerns on online education would likely provide greater impact on successful delivery of online education among pharmacy undergraduates in Sri Lanka ¹⁻³.

Key words: Online education, Pharmacy, B. Pharm undergraduates, Sri Lanka, Distance education

INVESTIGATION OF KNOWLEDGE REGARDING ANTIBIOTICS AND ITS USE AMONG GENERAL PUBLIC LIVING IN THE NORTHERN AND EASTERN PROVINCES OF SRI LANKA: A DESCRIPTIVE CROSS-SECTIONAL SURVEY

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Antimicrobials are a group of medicines used to treat microbial infections. Antimicrobial resistance (AMR) develops when an antimicrobial fails to effectively stop bacterial growth or prevent bacterial reproduction. The development of AMR is one of the biggest threats to global public health. Inappropriate and unnecessary use of antibiotics is a leading cause for the development of AMR. This study aimed to explore the knowledge of antibiotic use among the public living in the North and Eastern provinces of Sri Lanka.

This was a descriptive cross-sectional study using a self-administered validated questionnaire where the prevalence of antibiotics use and knowledge of antibiotics were investigated among the public attending the Teaching Hospital Jaffna (THJ) and Kalmunai Base Hospital (KBH). The data were entered into the statistical process for social sciences (SPSS) software (version 22.0) and coded for analysis. Descriptive data analyses were undertaken including frequencies and percentages.

A total of 780 samples were collected from both hospitals in which 400 samples were recruited from THJ and 380 samples were recruited from KBH. The samples comprised of more females (61.9%) than males, 33.5% were aged between 26-34 years and almost 43.1% completed secondary education. Nearly half of the respondents (47.2%) reported that they received advice about antibiotics from a healthcare professional when purchasing antibiotics ($p < 0.001$). One-third (36.3%) reported that they should stop taking antibiotics when they feel better ($p < 0.001$) and 35.6% reported that they should not use the antibiotics prescribed for other people (as friends or relatives) to treat the same illness ($p < 0.001$). People with higher education have more knowledge about antibiotics and its appropriate use. Higher education showed a significant association with improved knowledge ($p < 0.001$).

This study found that the majority of participants have a less knowledge on antibiotics and inappropriate attitudes toward antibiotic use among the public in the North & East provinces of Sri Lanka. This is alarming and mandates public health awareness intervention programs to be implemented on the use of antibiotics.

Key words: Antibiotics, Antibiotic use, Knowledge of Antibiotics, Antimicrobial resistance, Self-medication, Community perception

COMPUTER AIDED METHOD TO DETERMINE THE SEVERITY OF COVID-19 PNEUMONIA USING TEXTURE PROPERTIES OF DIGITAL CHEST RADIOGRAPHS

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COVID-19 pneumonia is a complication of COVID-19 infectious disease which affects the wellbeing of the lungs. Digital chest radiography is the most popular imaging modality used for evaluating COVID-19 patients due to its high availability. High opacity lung regions of digital chest radiographs mimic pneumonia. Percentage opacity represents the extent of lung infection. Texture is the spatial distribution of pixels in a digital image. Texture is interpreted by mean, standard deviation, smoothness, third moment, uniformity, entropy, kurtosis, percentage opacity and GLCM (grey level co-occurrence matrix) properties; contrast, correlation, energy, homogeneity, maximum probability, entropy of pixels which are known as texture properties. Objective of the present study was to develop a computer aided method to determine the severity of COVID-19 pneumonia using texture properties of digital chest radiographs.

This was a retrospective descriptive study done using 52 digital chest radiographs of COVID-19 pneumonic patients which were obtained from the open access “Cancer Imaging Archive.Net” website. Texture properties were calculated using a MATLAB program. Linear regression analysis was done to determine whether there is a relationship between percentage opacity and each texture property.

Coefficient of determination or R^2 values between each texture property value and percentage opacity set in between 0.0002 and 0.2000. Hence no significant correlation was observed.

Parallel studies conducted to find the relationship between radiographic features of chest radiographs and the severity of COVID-19, showed that the radiographic findings are predictive of the severity. Results of this study could not relate to the results of the previous studies. Extended studies must be done to better understand the findings of the study.

There is no significant correlation between the texture properties of digital chest radiographs and severity of COVID-19 pneumonia.

Key words: Computer-aided, COVID-19, Pneumonia, Digital chest radiography, Texture properties

THE IMPACT OF USING THE SURGICAL MASK, KN95 MASK, AND NANO AV99 RESPIRONE MASK ON PERFORMANCE AND PHYSIOLOGICAL OUTCOMES DURING EXERCISE IN HEALTHY INDIVIDUALS

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With the emergence of the Corona Virus Disease, it is now mandatory to wear a face mask at work and in public places. Many studies have focused on the protective mechanism offered by face masks against highly communicable respiratory diseases. However, the impact of the face mask on the person's performance is questionable. Therefore, this study was aimed to assess the impact of use of three popular facemask types in Sri Lanka on cardiopulmonary functions, exercise capacity and wearers' comfort in healthy young adults.

This study was an observational descriptive study that included 11 males and 11 female healthy young adults aged between 18 to 30 years. The participants underwent a 6-minutes moderate exercise test: Astrand bike test on a cycle ergometer under face mask wearing conditions in randomized order such as with no mask, surgical mask, KN95 mask and Nano AV99 Respirone mask. Heart rate, Oxygen saturation (SPO₂), Rated Perceived Exertion (RPE) and Rate of Comfort were recorded immediately after completing the exercise test and Maximal Oxygen Consumption (VO₂ max), Metabolic Equivalent (MET) were calculated.

Multivariate analysis of variance (MANOVA) test showed that there were no significant differences observed in the mask-wearing conditions during the cycle ergometer test in heart rate, SPO₂, RPE, VO₂ max and MET ($p=0.189$ in males and $p=0.263$ in females), and wearer's comfort ($p=0.496$ in males and $p=0.542$ in females).

The result of the current study is in line with most of the previous studies mentioning that wearing a facemask does not affect heart rate, SPO₂, RPE, VO₂ max and MET. We suggest performing additional research into the possibility of increasing the duration and intensity of the exercise testing.

Wearing a face mask does not affect the cardiopulmonary functions, exercise capacity and wearer's comfort during moderate intensity Astrand bike test.

Key words: Surgical mask, KN95 mask, Nano AV99 Respirone mask, Cardiopulmonary functions, Exercise capacity

ANTIBACTERIAL ACTIVITY OF “MALABULATH”, A MEDICINAL PLANT IN SRI LANKA: A PRELIMINARY STUDY

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“Malabulath” is a commonly used medicinal plant in Sri Lankan indigenous medicine. It is considered as a species of genus *Piper* which is endemic to Sri Lanka. Though it is broadly used to treat respiratory, gastrointestinal and ear diseases, its chemical constituents and bioactivity have not been assessed yet. Therefore, this study aimed to evaluate the antibacterial activity of aqueous (“sorasa”) and ethanol extracts of Malabulath leaves and stem.

Plant materials were collected from Gampaha area. The ethanol extraction and water extraction (“sorasa”) of leaves and stem of Malabulath were prepared separately. Antibacterial activity was evaluated against selected pathogenic bacteria: *Staphylococcus aureus* ATCC 25923, *Pseudomonas aeruginosa* ATCC 27853, *Escherichia coli* ATCC 25922, *Klebsiella pneumoniae* ATCC 700603 (Extended-Spectrum Beta-Lactamases - ESBL), *Klebsiella pneumoniae* ATCC BAA 1705 (Carbapenemase producer), *Klebsiella pneumoniae* ATCC BAA 1706 and a clinical isolate of Methicillin Resistant *Staphylococcus aureus* (MRSA). The disc diffusion and cut well methods were performed to evaluate ethanol extractions (50000 ppm), and water extractions.

Ethanol extract of stem demonstrated inhibitory activity against the *S. aureus* ATCC 25923 and MRSA while water extraction of stem did not demonstrate inhibitory activity against any of the tested organisms. Both ethanol and water extract of leaves displayed inhibitory activity against *S. aureus* ATCC 25923, *E. coli* ATCC 25922, *K. pneumoniae* ATCC BAA 1706 and MRSA. Only water extract of leaves demonstrated inhibitory activity against ESBL producing *K. pneumoniae* ATCC 700603. None of the extracts showed inhibitory activity against *P. aeruginosa* ATCC 27853.

The extract of Malabulath leaves have antibacterial activity against many selected bacterial pathogens including antibiotic resistant strains compared to the extract of stem. The active constituents of leaves that working against selected bacterial pathogens are soluble in both water and ethanol. This study highlights the importance of Malabulath as a potential source for developing a new broad-spectrum antibacterial herbal drug to combat antimicrobial resistance. Further studies will be carried out to confirm endemicity of Malabulath and to assess other antimicrobial spectrum, immune potentiating activity, other bioactivities and the phytochemical profile of Malabulath.

Key Words: Antibacterial Activity, Malabulath, Cut Well Method, Disc Diffusion Method, Extrac