HEALTH SCIENCES SYMPOSIUM
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ABSTRACTS
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Health and the Environment Journal (HEJ), a peer-reviewed biannual journal of the School of Health Sciences, Universiti Sains Malaysia was initiated in conjunction with the 10th anniversary of the establishment of the School of Health Sciences, Universiti Sains Malaysia in 2010. It is a platform for the dissemination of human health and environment information and research findings from various branches of health sciences. These include biomedicine, forensic science, sports science, dietetics, nutrition, medical radiation, radiography, audiology, speech pathology, nursing, environmental and occupational health, and psychology. Similar submissions dealing with health-oriented aspects of social science are also accepted. This Open Assess online journal welcomes articles on all aspects of human health and environment from local and international researchers.

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Oral Health ‘Knowledge, Attitude and Practice’ of Parents with Cleft Lip and / or Palate Children in Kelantan

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ABSTRACT: Parents play a central role to ensure the well-being of their children. An appropriate oral health (OH) knowledge is needed to ensure that the parents understand, aware and modify their attitude towards the OH care of their children. This study aimed to determine the OH knowledge, attitude and practice (KAP) of parents with cleft lip and/palate (CLP) children compared to non-cleft children. In this study, a comparative cross-sectional study was conducted on randomly selected children aged 1 to 6 years at HUSM and Kota Bharu Dental Clinic using a validated questionnaire on OH KAP and the problems faced by the parents during brushing their children’s teeth. Sixty-four parents with CLP and non-cleft children were recruited and all of them were Malay. Face-to-face interviews were done. Data were analysed with SPSS version 22.0. The significant level was set at P<0.05. The finding indicates that there was a significantly more parents in the non-cleft group that have the good knowledge compared to CLP group (P=0.043). However, for OH attitude and practice, no significant difference was found. Based on the mean score, both of the groups had almost the same knowledge (fair), attitude (good) and practice (poor). The presence of problems during tooth brushing between the two groups was also comparable (P=0.43). This study suggests that OH knowledge of parents with non-cleft children was better compared to those with CLP children. While OH attitude, practice and presence of problems during tooth brushing were comparable. OH promotion for the parents should emphasize towards translation of oral health knowledge and attitude into practice.

Keywords: Cleft children, Oral health knowledge, attitude and practice (KAP), Parents
Readability and Suitability of Oral Health Education Pamphlets produced by the Ministry of Health Malaysia

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ABSTRACT: Readability and suitability are two essential elements frequently used in determining the effectiveness of oral health education (OHE) materials. This study aims to assess the readability and suitability of OHE pamphlets produced by the Ministry of Health Malaysia (MOH). In this study, a total of 22 Bahasa Malaysia pamphlets were assessed. The Suitability Assessment of Materials (SAM) instrument and the Khadijah Rohani's Readability Formula were used to assess suitability and readability of the pamphlets respectively. However, of 22 pamphlets, only 5 were eligible for readability assessment because the Khadijah Rohani's Readability Formula is only applicable for texts with more than 300 words. The result shows that the pamphlets were readable at primary school reading level that ranged between standard 2 and 4. All 22 pamphlets were rated superior for suitability with an overall mean SAM score of 88% (SD 4.6%). The mean percentage of individual SAM evaluation criteria scores were as follows: content 76% (SD 14.2%), literacy demand 90% (SD 11.3%), graphics 86% (SD 10.5%), layout and typography 98% (SD 7.1%), learning stimulation and motivation 89% (SD 14.9%), and cultural appropriateness 100% (SD 0.0%). Some pamphlets were rated "not suitable" on the following SAM item: inclusion of summary or review (16 pamphlets), learning aids (1 pamphlet), use of captions for graphics (6 pamphlets) and use of interaction (6 pamphlets). In general, the MOH OHE pamphlets are readable and suitable for the Malaysian population including populations with low education level. Only few shortcomings were noted. We recommend revision of specific pamphlets to improve these weaknesses.

Keywords: Health Education, Oral Health, Pamphlets, Readability, Suitability, Suitability Assessment of Materials, Malaysia.
Landslides Disaster in Malaysia: An Overview

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ABSTRACT: Landslide is the movement of masses of rock, debris or earth (soil) down a slope under the influence of gravity. Although Malaysia is not a precipitous country (mountains and hills are less than 25% of the terrain), slope failures/landslides are a frequently happened. From 1993-2011, around 28 major landslides were reported in Malaysia with a total loss of more than 100 lives. Moreover, from 1973-2007, the total economic loss due to landslides in Malaysia was estimated about US $1 billion. Collapsed of the 14-storey block A of the Highland Tower in Ulu Klang, Selangor was the most tragic landslide in Malaysia with 48 deaths. The main factor that caused the slope failure/landslides at numbers site in hillside development in Malaysia are rainfall, storm water activities and poor slope management. Another cause of landslides can be due to the abusive prescriptive methods, inadequate study of past failures, design errors including insufficient site specific ground investigation. Besides, the development of highland or hilly terrain has increased developed and the many hills project is in the pipeline. All these factors together contribute to landslide disaster in this country. An impact of landslides in Malaysia has given rise to some environmental and socioeconomic issues such as loss of lives, damaged of properties and infrastructures, psychological pressures among the victims, disputes on land boundaries and also land degradation. Therefore, planning, design, construction and maintenance are very critical to achieve a safe and cost-effective hill-site development.

Key words: Landslide, Malaysia, Factor, Impact, Mitigation
ABSTRACT: Humankind is consuming environments and its components at an alarming rate. Therefore, it is very critical to apply the concept of environmental sustainability in order to ensure the environment does not collapse under the burden of our demands. Sustainability could improve the quality of human life while living within the carrying capacity of supporting ecosystems because the sustainability goal is to raise the global standard of living without increasing the use of resources beyond globally sustainable levels. Sustainability is important in protecting human health and the environment. However, it is a major hurdle to achieve sustainability. Even amongst the engaged, sustainability concerns are not a priority in all aspects of human lives. The most important reason is, most of the people failed to understand in deeply the meaning and the concept of ‘sustainability’. Thus, at the global scale, scientific data indicate that humans are living beyond the carrying capacity of planet earth and continuously degrading environmental quality. Hence, as communities grow and the environment declines, therefore achieving the sustainability is vital. How do we sustain this vital environment for future generations? How it translates into people’s lives? Creating a sustainable society will require changes in lifestyles, attitudes, expectations, behaviours and values. Therefore, to achieve a sustainability concept successfully, firstly and foremost, integrate the principles of sustainable development into country policies and programs which consider sustainability in all relevant decision making. Secondly, improve sustainable management of natural resources in order to maintain the integrity of ecosystems. Thirdly, enhance the contribution of the community in conserving and preserving the environmental quality. Finally, promote education and awareness by rising on environment sustainability within all stakeholders, especially government, private, in schools and communities.

Keywords: Environmental sustainability, Critical, Environment, Quality Of Human Life
Cathodic Stripping Voltammetric Determination of Yellow Fg Dye in Wastewater Samples from Batik Industry

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ABSTRACT: Yellow FG dye is one of the reactive dye types which are the main group of dyes used in the textile industry. It contains one or more reactive groups capable of forming covalent bonds with a hydroxyl or amino group on the fiber. The strong covalent bond produced would be expected to give excellent wash fastness properties. There are a few methods used for determination of Yellow FG dye includes UV-Vis spectrometer and high performance liquid chromatography (HPLC). In this work, cathodic stripping voltammetry (CSV) has been successfully developed for determination of Yellow FG dye. The linearity range of the method obtained from 0.5-3.0 ppm for Yellow FG in BRB pH 2.5 with a detection limit of 0.0443 ppm. The precision and recovery did not exceed 4.95% and 103%, respectively. The developed technique has been successfully used for quantitative determination of Yellow FG in 12 different batik’s wastewater samples collected from 6 different locations twice. The results show that the first collection, S1 sample containing 2.9725 ppm of Yellow FG which is the highest concentration compared with other samples. For the second collection from the same location, the Yellow FG has not been detected.

Keywords: Cathodic Stripping Voltammetry, Yellow FG Dye and Wastewater
Phenotype and Postnatal Factors Responsible for Maxillary Arch Constriction of UCLP Patients in a Bangladeshi Population

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ABSTRACT: Multiple phenotype factors (UCLP type, UCLP side, family history of cleft, family history of class III) and postnatal treatment factors (cheiloplasty, palatoplasty) factors are believed to be responsible for the maxillary arch constriction (MAC) in cleft lip and palate (CLP). Facial growth (maxillary) retardation, which results in class III malocclusion, is the primary challenge that CLP patients face. The aims of this retrospective study was to evaluate MAC of non-syndromic UCLP children and to explore the various phenotype and postnatal treatment factors that are responsible for MAC. 84 dental models were taken before orthodontic treatment and alveolar bone grafting. The mean age was 7.69 ± 2.46 (mean ± SD). MAC was assessed using modified Huddart Bodenham index (mHB) by two raters. Kappa statistics were used to evaluate the intra- and inter-examiner agreements, chi square was used to assess the associations and logistic regression analysis was used to explore the responsible factors that affect MAC. The total mHB score [mean (SD)] was -8.261(7.115). Intra- and inter-agreement was very good. Using crude and stepwise backward regression analysis, significant association was found between positive history of class III (P = 0.025, P = 0.030 respectively) and unfavorable MAC. Using the chi square test, complete UCLP (P = 0.003) and V-Y pushback palatoplasty (P = 0.005) were also significantly correlated with unfavorable MAC. This multivariate study suggested both phenotype (complete UCLP and positive history of class III) and postnatal (palatoplasty) factors had significantly unfavorable effect on the MAC.

Keywords: Maxillary arch constriction (MAC), Non syndromic UCLP children, Palatoplasty
Effects of Bee Propolis Supplementation on Immune Cells Count Following Prolonged Running in Recreational Runners

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ABSTRACT: Multiple training with various intensity and duration of exercise may lead to immune dysfunction among athletes. In order to reduce the risk, consumption of various nutritional supplements has been associated to enhance (‘boost’) immune function. This study aims to investigate the effects of bee propolis supplementation on immunological responses following prolonged exercise. In this study, 11 healthy male recreational runners (age: 21.0 ± 1.5 years; BMI 22.3 ± 2.5 kg.m\(^{-2}\)) were recruited. Participants performed two experimental trials; running trial without any supplementation (pre-supplementation trial) and running trial after 4 weeks of bee propolis supplementation with 2 tablets per day (500 mg of bee propolis each tablet) (post-supplementation trial). During each trial, participants performed warm-up on treadmill at 50% VO\(_{2}\max\) for 5 min and followed by running at 60% VO\(_{2}\max\) for 90 minutes. Blood samples were collected before warm-up, after warm-up, during running and 1 h post-exercise. Blood samples were analysed for total leukocyte, monocyte, and natural killer cells count. Statistical analysis was performed using two-way ANOVA with repeated measures. The result indicates that the total leukocyte, monocyte, and natural killer cells count were not significantly different between both running trials. However, prolonged running significantly increased immune cells count with the values started to return to baseline value 1 h post-exercise. In conclusion, four weeks of bee propolis supplementation with 2 tablets per day (500 mg of bee propolis per tablet) have no positive effects on immune cells count following prolonged exercise in recreational runners.

Keywords: Bee propolis, immune cells, exercise
Investigation of Third Molar Agenesis and other Dental Anomalies in A Bangladeshi Population: A Radiographic Study

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ABSTRACT: The aim of this study was to investigate the prevalence of third molar agenesis and other associated dental anomalies in a sample of Bangladeshi dental patients. And, also to investigate the relationship of other dental anomalies between third molar presence/agenesis. In this study, a retrospective study was performed using panoramic radiographs of 5923 patients, who ranged in age from 10 to 50 years old. All data (age, sex) were obtained and analyzed for third molar agenesis and other associated dental anomalies. All radiographs were analyzed by Planmeca Romexis® 3.0 software (Planmeca Oy, Helsinki, Finland). Pearson chi-square and one way ANOVA (Post Hoc) test were employed. The result indicates the prevalence of third molar agenesis was 38.4%. The frequency of third molar agenesis was significantly higher in females than males ($p < 0.025$). Third molar agenesis was significantly more prevalent in maxilla as compare to mandible ($p < 0.007$). The prevalence of other dental anomalies was 6.5%, among them hypodontia was 3.1%. The novel feature of this study, as per our knowledge we investigate a highest number of sample to determine prevalence of M3 agenesis compared to other population. Another interesting feature of this study, spectrum of dental anomalies were investigated and their association with third molar agenesis/presence group were revealed. In conclusion, prevalence of third molar agenesis varies in different geographic region. Among the other dental anomalies hypodontia was more prevalent.

Keywords: Third molar agenesis, maxilla, mandible, Bangladeshi dental patients
Salivary Lactoferrin and Selected Physiological Parameters Responses Following Prolonged Running in the Heat and Cool Environments

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ABSTRACT: This study aims to determine the effects of prolonged running in the heat and cool environments on selected physiological parameters and salivary lactoferrin responses among recreational athletes. This study used randomised and cross-over study design. In this study, thirteen male recreational athletes (age: 20.9 ± 1.3 years old) from Universiti Sains Malaysia participated in this study. They performed two separate exercise trials; 90 min running at 60% of their respective VO2max. One exercise trial was performed in the heat (31°C) while the other was in the cool (18°C) environment and this sequence was randomised. The recovery period between these two trials was one week. In the both trials, saliva samples, blood samples, heart rate, rate of perceived exertion, skin and tympanic temperature, oxygen consumption, nude body weight, room temperature, and relative humidity were collected. Paired t-test and two-way ANOVA with repeated measures were performed to analyse the data. The result indicates the participants’ skin temperature, tympanic temperature, body weight changes, heart rate, and plasma volume changes were significantly higher (p < 0.05) in the heat trial compared to cool trial. Nevertheless, prolonged exercise significantly increased (p > 0.05) lactoferrin concentration and secretion rate in both trials. As a conclusion, room/ambient temperature and prolonged exercise did not affect lactoferrin responses among recreational athletes but did affect by prolonged exercise. Nevertheless, all the selected physiological parameters were significantly affected by room temperature.

Keywords: Lactoferrin, Exercise, Athletes, Heat and Cool Environment
Exposure to Endotoxin Level in Inhalable Rice Dust among Rice Mill Workers

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ABSTRACT: Endotoxins are the lipid portions of lipopolysaccharides (LPSs) which is a part of the outer membrane of the cell wall of gram-negative bacteria. Rice dust containing endotoxin can cause systemic inflammatory response syndrome (SIRS) and multiple organ dysfunction syndromes (MODS). The aim and objective of this study are to compare the concentration of dust, endotoxin exposure level and lung function between rice mill workers and management workers in Kelantan. Samples were collected using the IOM inhalable dust sampler loaded with glass fiber filter (GFA) for 8 hours and analysed by using Limulus amebocyte lysate (LAL) test. The lung function was tested by using the spirometer (Cosmed Pony FX desktop, Italy) used to measure the amount of maximal air breathed out over pre-exposure (before work) and post-exposure (after work). Results showed that the dust concentration (mg/m\textsuperscript{3}) of rice mill workers (median: 8.86, range: 2.68-15.93) is significantly different compared with the USM management workers (median: 1.47, range: 0.22-2.53) and the rice mill management workers (median: 0.70, range: 0.47-1.72) \(p=0.005\) (< 0.05). The endotoxin concentration (EU/ml) of rice mill workers (median: 0.14, range: 0.11-0.16) is significantly different compared with the rice mill management workers (median: 0.06, range: 0.03-0.10) and the USM management workers (median: 0.05, range: 0.04-0.09) \(p=0.012\) (<0.05). The FVC, FEV1 and FEV1/FVC\% among the three groups shows no difference between pre and post-exposure at \(p=0.601\), \(p=0.960\) and \(p=0.660\) (<0.05), respectively. This study is important to promote health awareness among workers involving knowledge, attitude and safety practices about personal protective equipment (PPE) and gives the benefit for other researchers for further investigation about rice dust in Malaysia.

Keywords: Endotoxin, Rice dust, Rice mill
Rat Allergens Exposure Level of Animal House Personnel: From Work to Home Exposure

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\textbf{ABSTRACT:} Rat allergens represent the major occupational disease, especially among animal handlers due to direct exposure to rats. Allergens from rats can cause sensitisation of IgE-mediated sensitivity and hence increase the risk of disease. This study reported the concentration of rat allergen among animal house personnel from different locations which were Animal Research and Service Centre (ARASC), Health Campus Universiti Sains Malaysia (USM), Comet Universiti Putra Malaysia (UPM), Universiti Sains Malaysia (USM) Pulau Pinang and Animal Research Centre (ARC), Advance Medical and Dental Institute (IPPT), Bertam. The aims of this study was to determine the direct and the take home exposure level of rat allergens (Rat n 1) among the animal house personnel compared with the management workers from USM Health Campus. Three sampling techniques were used; airborne, wipe and dust vacuum sampling. Airborne sample was collected using a sampling pump attached to filter loaded sampler for two to three hours during working. Wipe samples were taken at mid-shift and post-shift for both hands and shoes. For take home study, vacuum dust sampling and doorknob wipes were taken at houses of animal house personnel to compare with the management workers’ exposure levels. In addition, the participants were also given questionnaire. ELISA kit Rat n1 RUP-6/RUP-1 was used as the detection method of rat allergen. The result shows that there was an increase in the workplace exposure level between mid-shift (median 0.022, IQR 0.022 - 1.550) and post-shift (median 0.02250, IQR 0.022 - 2.942) samples however non-significant. Non-significant different of house exposure level was also observed between the animal house personnel and the management workers. Thus, it can be concluded that although there was a presence of rat allergen contaminations on the hands and shoes of workers prior leaving the workplace, the take home pathway cannot be established. This may be contributed by proper hygiene practices that has minimised the work to home exposure.

\textbf{Keywords:} Rat allergen, Animal house personnel, Allergen contamination
Bacterial Pathogens of Ventilator Associated Pneumonia in Hospital USM

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ABSTRACT: Ventilator-associated pneumonia (VAP) is results from the invasion of the lower respiratory tract and lung parenchyma by microorganisms. It causes high mortality and morbidity and increased duration of hospital stay. This study has been conducted to evaluate the most commonly cultured microorganism among VAP patient in Intensive care unit, Hospital USM. This retrospective cross-sectional study on secondary data was conducted on 297 medical records of adult age >18 year-old patients who admitted to the intensive care unit in 2013. The ETT microbiology result was retrieved from Microbiology Department. The result indicates that there were 34.68% of patients developed VAP after 48 hours of mechanical ventilation. The mortality rate of VAP is 43.69%, while the survival rate is 56.31%. Acinetobactor sp. (45.6%) is the most commonly cultured microorganism following Klebsiella pneumonia (36.9%). Gram-negative organisms were found in 66% of patients with late onset of VAP. From our study, the majority of the microorganism cultured in VAP patients is Gram-negative organisms. Late-onset nosocomial pneumonia is often caused by Pseudomonas aeruginosa, Acinetobacter species, and Staphylococcus aureus. An understanding of the epidemiology and pathogenesis of VAP, along with implementation of appropriate preventive measures, are needed to decrease the incidence, morbidity, and mortality associated with VAP.

Key words: Ventilator-associated pneumonia, Microorganisms, Acinetobacter species, Pseudomonas aeruginosa
Impact of Bauxite Mining Activity: Assessment to Heavy Metals Contamination in Polluted and Non-Polluted Rivers in Kuantan, Pahang

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ABSTRACT: The uncontrolled of bauxite mining activity can cause the river contaminated with heavy metals. Heavy metals can give severe health affects due to their toxicity. Therefore, an assessment of selected heavy metals which are Arsenic (As), Cadmium (Cd), Nickel (Ni), Manganese (Mn) and Plumbum (Pb) were investigated from January to March 2016. The objectives of this research were to determine, analysis and compare the heavy metals concentration level in polluted and non-polluted rivers in Kuantan, Pahang. The factors that influence the concentration level of heavy metals were also determined. Two cycles of water sampling were done for each polluted and non-polluted rivers. The heavy metals concentration were analysed by using flame Atomic Absorption Spectrophotometer (AAS). The heavy metals concentration of As (2.098±0.982 mg/L), Ni (0.227±0.042 mg/L) and Mn (0.070±0.028 mg/L) were found higher in polluted rivers while Cd (0.071±0.006 mg/L) concentration level was higher in non-polluted rivers. Statistical analysis of independent t-test showed that there were no significant differences between polluted and non-polluted rivers in As, Cd, Ni, Mn, and Pb. The mean concentration for As, Cd and Ni for both polluted and non-polluted rivers were exceeded the permissible levels of National Water Quality Standard (NWQS). Mn concentration was recorded below the permissible level while Pb concentration was not detected in all the rivers. The results from Pearson test found that there were correlation between concentration of As (r = -0.588, p < 0.01), Cd (r = 0.467, p < 0.01) and Pb (r = -0.374, p < 0.05) with pH. Cd (r = 0.366, p < 0.05) concentration also found significant, positive and fair correlation with dissolved oxygen (DO). The output of this study was portray the heavy metals contamination in polluted and non-polluted rivers and it was useful for the environmental management and policies.

Keywords: Heavy metals, Bauxite mining, Rivers in Kuantan
Total Coliform, Faecal Coliform, *Escherichia Coli* and *Salmonella Typhi*: Investigation of Well Water in the Vicinity of Badang, Kota Bharu

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**ABSTRACT:** A study of *Salmonella*, total coliform, faecal coliform and *Escherichia Coli* in well water collected from 34 sampling points from seven areas in the vicinity of Badang, Kota Bharu was conducted. The area involved were Kampung Kijang, Kampung Che Latif, Kampung Semut Api, Kampung Badang, Kampung Pulau Pisang, Kampung Pulau Kundur and Kampung Dal. Well water was collected two times for every sampling point from March 2016 to April 2016. The objective of this study was to investigate the presence of *Salmonella*, total coliform, faecal coliform and *Escherichia coli*. Furthermore, this study also conducted to find the factors contributing their survival in well water. The laboratory testing of bacteria was conducted using the membrane filtration technique and streak plate technique. The result of this study showed some of those bacteria were significantly correlated to four factors which were pH, dissolved oxygen, depth of well and distance of well from sanitary tank, at \( p < 0.05 \). In addition, the numbers of those bacteria were differences between close good, partially close well and open well. The higher number of bacteria was found in close well. Overall, there were no *Salmonella* found in Badang. The number of total coliform in all areas exceed the drinking water quality standard (0 CFU/100 ml) given out by the Ministry of Health (MOH).

**Keywords:** *Salmonella*, Total coliform, Faecal coliform, *Escherichia coli*, Well water
Assessing the Level of Serum Heavy Metals among Kota Bharu Firefighters

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ABSTRACT: Firefighters are frequently exposed to significant concentrations of hazardous materials. They are exposed to smoke particles that spread through inhalation or skin and clothing contamination, with following absorption of adsorbed chemicals through the skin at the fire scene or at later times. This study aimed to investigate the occurrence of heavy metals in serum among firefighters. A cross-sectional study design utilizing convenient sampling method was used to recruit 17 firefighters from the Kota Bharu Fire Station as the exposed group and 17 staffs from Universiti Sains Malaysia, Health campus as the control group for this study. Blood samples were collected from all volunteer subjects and investigated for relevant parameters. Arsenic is the highest heavy metal level detected in Kota Bharu firefighters followed by lead and cadmium respectively. The results obtained showed that there was no significant difference in serum heavy metals level in Kota Bharu firefighters as compared to a normal control group (p>0.05). There was also no significant difference in serum heavy metals of Kota Bharu firefighters and normal control group and smoking status. It shows that lead and arsenic level is higher among ex-smokers while cadmium level is higher among smokers. Comparison between smoker and non-smoker group, smoker and ex-smoker group and non-smoker and the ex-smoker group showed no significant difference in all the groups tested. The varying recent fire incidents experienced by the firefighters may lead to the insignificant level of the heavy metals. Other factors may also influence the heavy metal level such as smoking status, age, seafood intake, occupational factors and PPE usage. This study stresses on the importance of acknowledging the occupational exposure to fire smoke, personal hygiene and cleanliness as well as wearing personal protective equipment to minimize the risk of heavy metal exposure.

Keywords: Heavy Metal, Firefighters, Fire smoke
Management Behaviour Survey for Familial Caregivers of Parents with Asthmatic Children following Completion of Paediatric Asthma Education Programme (PAEP)

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ABSTRACT: The prevalence of asthma among children is common. In Malaysia, the clinical observations have demonstrated that many children with asthma were not properly assessed and do not get proper treatment. Hence, poor asthma control can cause disruption to the child's ability to get enough sleep, pay attention, participate in school activities and thus affecting their quality of life. The objectives of this study were to identify the characteristics of social demography for parents and children involved in the PAEP, and to determine the management behaviour survey for familial caregivers of parents with asthmatic children following completion of PAEP programme. The study was an interventional study using a new model of PAEP which was delivered to parents through conventional lecture and brochures. A total of 78 parents of children aged 8 to 12 years old with asthma enrolled in Paediatric Clinic at Hospital Universiti Sains Malaysia were selected to enter PAEP. This study used two sets of questionnaire pre and post Paediatric Asthma Education Programme (PAEP). During the Pre-intervention phase, eligible parents were recruited through attendance from paediatrics outpatient. The questionnaire consists of social demographic data and questions on parents' management behaviour which consists of 15 questions which was adapted from Management Behaviour Survey for Familial Caregivers using a five Likert points. The study showed that the Mean age for children with asthma was 9.31 years. The mean values obtained by the parents at baseline and after eight weeks after PAEP. There was a statistically significant increase in parents management behaviour scores from pre-intervention (Mean= 53.16, SD= 10.22) to post-intervention (Mean= 62.33, SD = 7.26), P<.001. The mean increase in Management Behaviours Survey for Familial Caregivers questionnaire scores was 9.16 point with a 95% confidence interval ranging from 7.27 to 11.06. Positive benefit of PAEP has been seen on parents’ behaviour change especially at home. Parents who attended PAEP performed better in the post-intervention compared to pre-intervention test. In conclusion education on asthma management at home to parents should be headed by personnel who can speak the same language and bring the education value regardless of parental educational background. This will allow better understanding and practice on management behaviour. PAEP has given some insight on changes required for parental education trend.

Keywords: Asthma, Paediatric Asthma Education Programme, Familial caregivers
The Presence of Total Aflatoxin in a Rice Processing Factory

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ABSTRACT: The main objective of this study was to determine whether there is the presence of aflatoxin at the rice factory. Area and personal airborne samples were collected using IOM Sampler attached to Gil Air pump via tubing for 8 hours. Wipe sampling on hands and Lung Function Test were conducted during the middle and at the end of shift. The airborne and wipe samples were extracted and analysed for aflatoxin using the ELISA test. The concentrations of total dust at the factory area (median: 41.05 mg/m³, IQR: 17.40-43.97 mg/m³) was significantly higher compared to the office (median: 1.87 mg/m³, IQR: 0.12- mg/m³) (p=0.020) while the concentrations of total aflatoxin was non-significant (p=0.121). Personal total dust concentration between factory and office workers were significantly different (p=0.005). For dermal contamination, significant difference results were found between factory and office workers for middle shift (p=0.002) and post shift (p=0.010). There were no significant difference for lung function test of either between middle and post shift or between factory and office workers. There was significant negative correlation between total dust concentration and middle shift dermal contamination (r=-0.836, p=0.001) and with FVC value during middle shift (r=-0.655, p=0.008). A significant positive correlation was found between dermal contamination middle shift and FVC middle shift (r=0.642, p=0.010) and with FEV₁/FVC middle shift (r=-0.533, p=0.041). In conclusion, the presence of aflatoxin stress the importance that the hygiene practices should be considered seriously.

Keywords: Aflatoxin, Hygiene practice, Rice Processing Factory
Isocyanate Dermal Exposure among Car Spray Painters in Kota Bharu, Kelantan

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ABSTRACT: The main route of exposure for isocyanate is via inhalation but an alternative yet important route that can contribute to sensitisation and asthma is also by skin exposure. This cross sectional study design is aimed to associate between isocyanate skin exposure and respiratory symptoms among car spray painters. A total of 11 car spray painters were recruited utilising purposive sampling method from five medium sized auto body workshops that carry out painting tasks in Kota Bharu, Kelantan. SWYPE™ sampling pads (Colormetric Laboratories, Inc, USA) were used to detect the isocyanate contamination on work surfaces (workbenches, container caps, spray gun and spray booth door handles), shoes and skin (hands and forehead) of car spray painters after painting task. The subjects were interviewed using guided questionnaire gathering sociodemographic, work and respiratory symptoms information. The majority of area hard surfaces wiped at the auto body workshops showed positive colour changes (66%, n=29) indicating presence of isocyanate contaminations. Skin isocyanate contamination showed higher frequencies of contamination on both hands (72.7%, n=8) than on the forehead. Six (54.5%) car spray painters had isocyanate contamination on shoes. There was no significant correlation of isocyanate hard surfaces toward skin contaminations, but positive significant correlation between container caps and workbenches contamination (r=1.000, p<0.01). When associate between skin and shoes contaminations with respiratory symptoms, only phlegm at morning was significant (p=0.024). SWYPE™ can serve as an important tool for detection of isocyanate dermal exposure routes towards respiratory symptoms. Preventive measures such as PPE and hygiene practices are highly recommended to minimise isocyanate skin exposures among car spray painters.

Keywords: Occupational asthma, Isocyanates, Car spray painters
Mouse Urinary Allergen Exposure among Animal House Workers

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ABSTRACT: Urine of mice is the main source of allergenic proteins that can enter the human body through inhalation or dermal exposure of laboratory animal care workers. The allergen exposure is not limited to direct contact to animals but the allergens can be spread from one environment to another by becoming airborne. The objective is to study the mouse urinary allergens (Mus m 1) concentration levels among animal house workers. Mus m 1 were measured from personal and area airborne samples using IOM sampler attached to a sampling pump via tubing for 3 to 8 hours. Wipe sampling was utilised to measure Mus m 1 contamination on hard surface areas of workplace using cotton swab. Personal wipe sampling on hands and shoes were collected during pre-, mid- and post-shift. The samples were extracted and analysed using ELISA. Questionnaire enquiring about sociodemographic and job tasks were completed by subjects. Levels of Mus m 1 were significantly higher in mid-shift and post-shift wipes of shoes samples (p=0.043). There were significant difference of Mus m 1 contamination mid-shift hands wipe samples (p=0.01) and mid-shift shoes wipe samples (p=0.01) between laboratory technicians and office workers. There was also a strong significant correlation between mid-shift wipe hands and shoes (r=1.000, p=0.001). In conclusion, Mus m 1 was detectable in personal and area monitoring of airborne sampling and dermal wipe sampling. This study stressed the importance of following standard operating procedures, personal cleanliness and wearing of personal protective equipment to prevent the spreading of occupational allergens.

Keywords: Mouse urinary allergen, Animal house workers, Mus m 1, Shoes
The progress of industries has led to the increased of pollutant emission into the environments. One of the most common pollutants is heavy metals. Excess consumption of metal elements can cause chronic disease for consumers in the future. The common heavy metals that are often found in the food samples are Plumbum (Pb), Manganese (Mn) and Copper (Cu). Therefore, the study was conducted to assess the level of heavy metals of Pb, Mn and Cu concentration in street foods sold at selected area in Kota Bharu, Kelantan. This study also deals with human health risk assessment of metal contamination through the consumption of street foods. The level of heavy metals in street foods was compared to the level of heavy metal in non-street foods that sampled from Health Campus Universiti Sains Malaysia’s cafeterias. The food samples were digested prior being analyzed using Atomic Absorption Spectrometry (AAS) method. The results showed that concentration of Pb, Mn and Cu decreased in the following sequenced: Pb > Mn > Cu. The mean of Pb concentration is higher than Mn and Cu in street foods. The average concentration of Pb, Mn and Cu were approximately 0.665mg/kg, 0.188mg/kg and 0.021mg/kg. Target Hazard Quotient (THQ) was used in the health risk assessment to determine carcinogenicity of the food samples. The result shows that the concentration and THQ of all metal studied (Pb, Mn, Cu) are less than 1; signified that a daily exposure at this level is unlikely to cause any adverse effects during a person’s lifetime. In conclusion, there is a heavy metal presence in street foods, but the THQ value showed the foods is not dangerous to be consumed.

Keywords: Heavy metal, Health Risk Assessment, Pollution
The Effect of Using Meditative Music During Imagery on Netball Shooting Performance

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ABSTRACT: Imagery is a widely used psychological skills for the enhancement of performance in sport, and music is often used to enhance sporting performance. The purpose of this study is to examine the effect of using meditative music during imagery on netball shooting performance. This is a pre-test – intervention - post test study design. Twenty-nine healthy undergraduate female students aged between 18 to 24 years old from Universiti Sains Malaysia participated in this study. Participants were novices in netball sport. They were randomly assigned into two-research conditions, namely a) Meditative music during imagery (MMI; n = 16) and b) No music during imagery (NMI, n = 13). The intervention duration was 4 weeks and they were required to perform 12 sessions of imagery interventions. Participants’ completed the Sport Imagery Ability Measurement (SIAM), Rosenberg Self-Esteem Scale, and Revised Competitive State Anxiety Inventory 2 (CSAI-2R). The result on SIAM showed that all participants have scored from moderate to high score in the subscales of imagery abilities. No significant difference was found for shooting performance scores, self-confidence, and anxiety level between two research conditions. In conclusion, meditative music during imagery did not give significant advantage to improve the novice netball players compared with no music condition.

Keywords: Meditative music, Imagery, Shooting performance
Antioxidant and Antibacterial Properties of Different *Nypa Fruticans* Fruit Extracts

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**ABSTRACT:** *Nypa fruticans* (nypa) has many functions and can treat many diseases. However, nypa is still categorized as underutilized plant. The fruits are hard and cannot be eaten when ripe. Instead of ignoring the ripe fruits, it is better to utilize this high potential natural medicine fruit for commercial purposes. Thus, this study aims to extract the bioactive compounds and bioactive peptides from ripe nypa flesh using different methods and to test the extracts for antioxidant and antibacterial activities. Two test systems, namely total phenolic content (TPC) and DPPH free radical scavenging, were used for the antioxidant analysis. The antibacterial screening was carried out by disc diffusion method towards selected bacteria. For phenolic compound extraction, water gave the highest yield with 14.87 ± 0.37 %. Then the yield obtained for bioactive peptides was 6.91 ± 0.78 % and the concentration was 4.20 ± 0.17 μg/μl. Meanwhile, for bioactive compounds, extraction using 50 % acetone was found to have significantly high levels of TPC (151.09 ± 0.84 mg GAE/ g DW sample) and antioxidant activity by having the lowest IC50 value (1.34 ± 0.10 mg/ml). From statistical analysis, there was a strong positive correlation between TPC and antioxidant activity (R = 0.986). Finally, all the four extracts were subjected to screening for their possible antibacterial activity. However, all the extracts produced no effect on all the tested bacteria. Overall, the results from this study showed that the flesh of ripe *Nypa fruticans* fruit extracts contain only antioxidant property which can be a reference for further study.

**Keywords:** Antibacterial, Antioxidant, Bioactive compounds, Bioactive peptides, *Nypa fruticans*, Phenolic content
Investigation of *Quercus Infectoria* (QI) Methanolic Extract Cytotoxicity Effect on Glioma and Neural Stem Cell

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**ABSTRACT:** Glioblastoma multiforme (GBM) is the most malignant subtype of brain cancer. Current standard treatments are limited in effectiveness and impose additional side effect. *Quercus Infectoria* (QI) was reported to be anti-carcinogenic and exhibit inherent antioxidant activity. Here, we evaluated the effect of the QI extract on GBM cell line (DBTRG-05MG) and neural stem cell line (H9-hNSC). Soxhlet extraction was performed using 70% and 100% methanol solvent. Antioxidant activity was measured using DPPH free radicals scavenging assay. Cells were cultured and optimal extract concentration was determined via MTT assay. The genomic and proteomic analysis of the QI-treated cells were performed using real-time PCR and Western Blot respectively. We observed that 100% methanolic QI extract (100%-Met) produced significantly higher yields (78.46%) compared to 70% methanolic QI extract (70%-Met) (43.7%). Despite not significant, 100%-Met showed higher antioxidant activity compared to 70%-Met (94.62% vs 91.33%). 100%-Met (IC<sub>50</sub>:70.76 µg/ml) and 70%-Met (IC<sub>50</sub>:71.55 µg/ml) were found to show anti-DBTRG-05MG proliferation. Following treatment, DBTRG-05MG showed a reduced cancer cell marker (PKM2) gene expression. CASP3 gene, a key player in apoptotic pathway was expressed significantly higher in 100%-Met-treated DBTRG-05MG compared to non-treated group. However, CASP3 expression in 100%-Met-treated H9-hNSC was not significantly different to the non-treated control, indicating QI extract did not possess the apoptotic effect on H9-hNSC. Similarly, Western Blot analysis produced clear band at 35 kDA which represent caspase-3 for treated DBTRG-05MG, but absent in treated H9-hNSC and non-treated control. In conclusion, QI extract is a potential anti-cancer drug with negative cytotoxicity response towards non-cancerous cell such as NSCs.

**Keywords:** *Quercus Infectoria* (QI), Glioblastoma multiforme, Stem cell
Apoptosis Activity of Recombinant BCG Expressing the MSP-1C of *Plasmodium falciparum*

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**ABSTRACT:** Macrophage apoptosis exerts an efficient mechanism in controlling intracellular infection during the innate immune response. This study was carried out to determine the apoptosis activity in mouse macrophage cell line J774A.1 following infected with a BCG clone and a recombinant bacille Calmette-Guerin (rBCG) clone expressing the C-terminus of merozoite surface protein-1 (MSP-1C) of *Plasmodium falciparum* for 48 hours. The results demonstrated that the rBCG clone was significantly reduced the viability of the infected macrophages. Furthermore, nuclear staining with Hoechst 33342 and flow cytometric analysis using Annexin and PI staining showed that the clone had also significantly enhanced macrophage apoptosis in J774A.1 cells in comparison with BCG clone. The apoptotic response of the rBCG-infected cells were accompanied with the up-regulation of p53 expression at the cellular level. The rBCG clone also significantly increased the caspase-9 activity, suggesting the involvement of mitochondrial-mediated pathway. However, caspase-3 and -8 activities were not significantly different between the rBCG-infected cells with with the BCG infected cells. In conclusion, rBCG clone capable to increase apoptosis activity of macrophage cell line J774A.1. and represents a promising candidate to eliminate malaria parasites.

**Keywords:** Macrophage apoptosis, BCG, malaria, MSP-1C
A Preliminary Study of Major Surface Associated Proteins of *Acinetobacter baumannii*

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**ABSTRACT:** *Acinetobacter baumannii* are able to accumulate resistance which lead to the emergence of multidrug-resistant strain causing hospital-associated outbreaks. Several advanced diagnostic methods have been developed for identification of *Acinetobacter baumannii* to the species level, such as ARDRA and AFLP. Studies on the expression of the major cell-wall associated proteins of *Acinetobacter baumannii* can be used for identification of potential biomarker candidates towards development of rapid and reliable protein-based diagnostic tests for the detection of *Acinetobacter baumannii*. This study aims to determine the surface associated protein (SAPs) profile of *Acinetobacter baumannii* expressed at 37°C, 38.5°C and 41°C by sodium-dodecyl-sulphate polyacrylamide gel electrophoresis (SDS-PAGE). The SAPs of *Acinetobacter baumannii* ATCC 19606 was extracted from overnight culture grown in three different controlled temperatures. The SAPs protein profiles expressed at 37°C, 38.5°C and 41°C were obtained by performing SDS-PAGE proteomic analysis. The result showed that there were six major SAP proteins detected in the *Acinetobacter baumannii* strain with a molecular size of 40.95kDa, 35.0kDa, 30.08kDa, 27.22kDa, 17.99kDa and 15.167kDa. All major proteins were expressed at all three temperatures tested. Proteomic analysis also showed that all the major proteins were decreased in degree of SAPs expression in ATCC 19606 strains when expressed at 38.5°C and 41°C when compared with expression at 37°C. In conclusion, this study identified six major SAPs in *Acinetobacter baumannii*. These proteins may play important role in pathogenesis and survival of the bacterium at higher temperature. Further studies need to be carried out to evaluate the antigenicity of these proteins and their potential as biomarker and virulence candidates.

**Keywords:** *Acinetobacter baumannii*, surface associated protein (SAPs), SDS-PAGE
The Locally Grown Spirulina / Arthrospira Platensis Effects on the Levels of Total Cholesterol, HDL, Triacylglycerols and Plasma Lipoprotein Lpase Activity in Feline Cats Fed with a Hypercholesterolemic Diet

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ABSTRACT: The effects of locally grown Spirulina platensis on lipoprotein lipase activity and hepatic triacylglycerol lipase activity in post heparin plasma were studied in feline cats fed with a high hypercholesterolemic diet. Male cats aged 1 year old (body weight, 3.2±0.51 kg) were fed with the high cholesterolemic diet for 8 weeks. Hypercholesterolemia was induced in cats by feeding them with this high saturated fat cholesterol diet (CD, 350 mg/d) and the effects of supplementing this diet with 0.5g/d Spirulina platensis was evaluated by measuring the levels of serum total cholesterol (TC), triacylglycerol (TAG) and high density lipoprotein (HDL cholesterol) at the start of the experiment and after 30 d and 60 d. The results showed that the levels of serum cholesterol decreased from 220±32 mg.dL\(^{-1}\) in the cats fed a CD without S. platensis to 110±29 mg.dL\(^{-1}\) to those fed with a high cholesterol diet supplemented S. platensis (p<0.005). The addition of Spirulina to the cholesterolemic diet did not cause significant decrease on the levels of triacylglycerol in the cats. However, the levels of serum high density lipoprotein (HDL cholesterol) was 24±11 mg.dL\(^{-1}\) for cats fed a CD without S. platensis as compared to 39±12 mg.dL\(^{-1}\) in those fed a CD supplemented with S. platensis (p = 0.1510).

Keywords: Spirulina platensis, Fat cholesterol diet, Lipoprotein lipase activity, triacylglycerol Lipase activity, Feline cats fed
Effect of Dietary Supplementation of the Locally Grown Spirulina / Arthrospira platensis on Growth, Feed Conversion and Plasma Lipoprotein Lipase Activity in Tilapia Cultured for Human Consumption

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ABSTRACT: In this study, the effect of dietary supplementation of Spirulina platensis on growth, feed conversion and lipoprotein lipase activity in plasma were studied in tilapia (Oreochromis sp) fed with a standard commercial diet. Fish fed 30% Spirulina performed better than those fed with the commercial diet. At the end of the experiment, there was no significant differences between all groups in terms of average final weights (p>0.05). No significant differences were observed in specific growth rate, feed conversion rate and weight gain. However there were significant differences in terms of feed conversion rates between groups (p<0.05) and it was the highest in group D (1.012±0.051) and the lowest in group A (2.015±0.082). It has been shown that the best growth rate (1.911±0.055 g/d) and live weight (10.821±0.006 g) were recorded in group D. The results also showed that the levels of serum cholesterol decreased from 159±38 mg.dL⁻¹ in the tilapia fed a standard commercial feed without S platensis to 98±21 mg.dL⁻¹ to those fed with a standard commercial diet supplemented S. platensis ( p<0.05).

Keywords: Spirulina platensis, Lipoprotein lipase activity, triacylglycerol Lipase activity, Oreochromis sp.
Evaluation of Developmental Toxicity and Teratogenicity of *Quercus Infectoria* Galls (Manjakani) Aqueous Extract in Sprague Dawley Rats

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*Quercus infectoria* galls (QIG) or locally known as manjakani is commonly used by reproductive-age women to restore uterine elasticity and increase sexual pleasure. However, reports pertaining to its possible effects particularly on progression of developing embryo are very limited. Thus, the present study was conducted to provide evidence on the potential deleterious effects of QIG aqueous extract on embryonic development including teratogenicity in pregnant Sprague Dawley rats. QIG extract at the doses of 0 (control), 125, 250, 500 or 1000 mg/kg/day were orally administered to experimental rats during pre-mating, mating and up to gestation periods of day 16 while sacrificed on day 21 of pregnancy. Results obtained revealed that there were no substantial effects on the number of corpora lutea, implantation sites, percentages of pre-implantation loss and post-implantation death, gravid uterine weight, number of life foetuses and foetal body weight in all experimental animals. Similarly, no correlation and distinguishable diversities of foetal sex ratio were observed among all groups. Gross examination of external and internal organs of foetuses did not indicate evidence of QIG-related alterations as all foetuses displayed normal physical appearances. These findings suggest that the aqueous extracts of QIG of up to 1000 mg/kg/day exerted no developmental toxicity or teratogenic effect in rats.

**Keywords:** Quercus infectoria galls, Toxicity, Teratogenicity, Aqueous extracts
Optimization of ELISA Using Immunogenic Outer Membrane Proteins of

*Shigella Sonnei* for Detection of Shigellosis

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**ABSTRACT:** Shigellosis is an intestinal disease caused by *Shigella* spp. The main sign of shigellosis is bloody diarrhea, fever and stomach cramps. Numerous studies have reported that enzyme immunoassay gave high specificity and accuracy compared to culture method. In our previous study, three antigenic proteins of *S. sonnei* (33.3kDa, 43.8kDa and 100.3kDa) were identified as potential targets for development of diagnostics for shigellosis. The main aim of this study was to develop a rapid and reliable enzyme-linked immunosorbent assay (ELISA) for detection of shigellosis. The antigenicity of the three target proteins of *S. sonnei* were further evaluated using ELISA. Important parameters such as protein concentrations, antibody concentrations and antibody-antigen incubation time were optimized to obtain the maximum signal for the detection of specific antibody in patients’ sera against IgA. The result showed that all three antigenic proteins gave higher absorbance reading when probed with *S. sonnei* sera and lower absorbance reading when tested with non-shigellosis sera. Based on the result, target proteins 33.3, 43.8 and 100.3 kDa showed highest signal when coated with 2.5, 5 and 1.25 μg/ml protein concentrations respectively. For antibody concentration, all the proteins showed highest signal when probed with 1/50 dilutions of *S. sonnei* sera. For antigen-antibody incubation time, better signal response can be observed on 60 minutes. In conclusion, the three target proteins (33.3kDa, 43.8kDa and 100.3kDa) gave higher absorbance signal when probed with *Shigella sonnei* sera and lower absorbance when tested with non-shigellosis sera. It shows that these antigenic proteins are specific only to *S. sonnei* sera.

**Keywords:** Rapid detection, *Shigella sonnei*, Shigellosis
Potential Protective Effects of Kundur (*Benincasa hispida*) Water Extract on Streptozotocin-Induced Diabetic Rats

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ABSTRACT: Natural therapeutic agents have been used for some time in the management of type 2 diabetes mellitus due to its efficacy, the ability to reduce side effects and cost effective. *Benincasa hispida* has been shown to possess anti-hyperglycaemic properties and protective effects against diabetic complications which can lead to tissues damage. Streptozotocin-induced Sprague Dawley rats were divided into four groups Group I was set as normal control, group II as diabetic control, group III was treated with *B. hispida* water extract (250 mg/kg) and group IV was treated with metformin. At the end of 8 weeks duration, blood samples were collected for biochemical evaluations while liver and kidney were extracted for histological study. Results showed that there were some significant improvements in biochemical parameters for lipid profiles, liver function test, kidney function test and glycosylated haemoglobin of BHE treatment rats in comparison with untreated diabetic rats (p<0.05). Histological observations were in line with these findings. We conclude that the *B. hispida* water extract may exhibits significant protective roles in diabetic especially in delaying or minimizing diabetes-related complications.

Keywords: *Benincasa hispida*, Liver, Kidney, Diabetes, Complications
Total Aluminium (Al) in Gravity Feed System Water from Three Orang Asli Villages in Selangor


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ABSTRACT: Gravity Feed System (GFS) is a type of water supply that uses gravity to distribute water from upper parts of a river or spring to a residential area through a series of pipes without any chemical treatment. The maximum allowable concentration for aluminium in drinking water is 0.2 mg/L as stated in the National Standard for Drinking Water Quality (NSDWQ). This study was conducted to determine aluminium concentration in GFS water samples from three Orang Asli villages in Selangor. A cross-sectional study was conducted in January and February of 2016 at three Orang Asli villages, namely Kampung Sungai Lalang Baru (KSLB), Kampung Kuala Pangsun (KKP) and Kampung Ulu Kuang (KUK). Three replicates of water samples were collected using 250ml HDPE bottles. Aluminium was determined using Inductively Coupled-Plasma Mass Spectrometry (ICP-MS). A total of 150 water samples were collected, 50 from each village. Mean aluminium concentrations for KSLB, KKP and KUK were 0.07 ± sd 0.03 mg/L with a range of 0.1 – 0.15 mg/L, 0.129 ± sd 0.089 mg/L with a range of 0.02 - 0.23 mg/L and 0.048 ± sd 0.009 mg/L with a range of 0.03 - 0.07 mg/L, respectively. All readings were below 0.2 mg/L except in KKP, where three (3 – 6%) samples exceeded the standard. This study found that the mean aluminium concentrations for all three villages were below the standard. In aluminium terms, the GFS water from the three villages are safe to be consumed by the residents.

Keywords: Aluminium, GFS, Orang Asli, Drinking water, National Standard for Drinking Water Quality
Hypertension and Its Association with Periodontal Parameters in Chronic Periodontitis

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ABSTRACT: Hypertension is one of the major causes of cardiovascular disease worldwide. Chronic periodontitis (CP) is an inflammatory disease of the supporting tissues of the teeth and caused by specific microorganism. Previous studies found that there is a biological relationship between hypertension and periodontitis since both diseases share some common risk factors. The objectives of this study were to determine the association between hypertension and periodontal parameters in CP patients. Ninety records of CP patients treated in Dental Clinic, Hospital Universiti Sains Malaysia, Kelantan from 2010 until 2013 were retrieved and reviewed. The diagnosis of periodontal disease and the presence of hypertension were recorded. Demographic data and records of periodontal parameters were also obtained. The data was analyzed using SPSS version 20.0. Majority of the subjects were from Malay ethnic group (94.4%) with the age range between 41 to 61 years (67.8%). More than 50% of the subjects had mild to moderate periodontitis. CP with hypertension encountered 12.2%. There was no significant association between plaque scores, gingivitis scores and probing pocket depth with hypertension (P<0.05). However, the clinical attachment loss was significantly higher in CP with hypertension compared to non-hypertensive CP (P=0.012). In conclusion, there is possible association between periodontal tissue loss and hypertension. Therefore, further investigation is recommended thus will help in managing oral and systemic health diseases.

Keywords: Hypertension, Periodontal parameters, Chronic Periodontitis
Preliminary And Toxicity Study of *Piper sarmentosum* on *Plasmodium falciparum* As a Potential Anti-Malarial Treatment

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**ABSTRACT:** Malaria is one of the world’s major infectious diseases partly due to the development of multidrug-resistant *P. falciparum*. Therefore, the discovery and development of new potential antimalarial drugs from medicinal plants is urgently required. *P. sarmentosum* or locally known as daun kaduk is commonly used as traditional medicinal plants to treat malaria and malarial symptoms. The aims of this study were to determine the inhibitory concentration (IC<sub>50</sub>) of water and methanol extracts of *P. sarmentosum* against *P. falciparum*, and to evaluate toxicity and safety profile of these plant extracts by determining the lethal concentration (LC<sub>50</sub>) and the heavy metal contents in this plant. The *in vitro* antimalarial activity and determination of IC<sub>50</sub> values of water and methanol extracts against Dd2 *P. falciparum* strain were assessed using SYBR Green I assays. The LC<sub>50</sub> values of each extract were determined using brine shrimp lethality test (BSLT) by calculating the percentage mortality of the brine shrimp nauplii. The concentration of heavy metals including lead (Pb), zinc (Zn), cadmium (Cd), chromium (Cr) and arsenic (As) was determined using atomic absorption spectrometry (AAS). The determination of IC<sub>50</sub> values of both extracts revealed the inactive antimalarial activity of *P. sarmentosum*. The IC<sub>50</sub> values of water and methanol extracts of *P. sarmentosum* were 138.8 and 229.7 µl/mL, respectively. The toxicity evaluation showed the LC<sub>50</sub> values of water and methanol extracts of *P. sarmentosum* were 894.94 ± 2.98 and 2741.7 ± 1.89 ppm, respectively. This suggests that the methanol extracts of *P. sarmentosum* was considered as toxic whereas the water extract was non-toxic. The heavy metals identified were below the safety limits recommended by WHO/FAO except for arsenic.

**Keywords:** Malaria, *Plasmodium falciparum*, *Piper sarmentosum*
Mutational Screening of IDH1 and Mitochondrial ND3 in Brain Tumor Patients by Using PCR-RFLP Assay

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ABSTRACT: Brain tumors are the second commonest cancer in children, contributing nearly 21% of cases, and the third most common cancer type in adolescents. It is widely believed that the initiation and progression of brain tumors involve the accumulation of multiple genetic alterations in the genome of both the nucleus and mitochondria. The aim of this study was to assess the associations of nuclear-encoded gene isocitrate dehydrogenase 1 (IDH1) and mitochondrially-encoded gene, NADH Dehydrogenase 3 (ND3) mutations with brain tumor in a Malaysian patient, using the PCR-RFLP method. Genomic DNA patients were extracted from 38 fresh-frozen tumor tissues as well as from 40 blood healthy controls. Mutation hotspot in the codon 132 of IDH1 and codon 114 (A10398G) of ND3 were detected using the PCR-RFLP method and later were confirmed by DNA sequencing. Among the 38 brain tumors analyzed, 23 cases (60.5%) had IDH1 mutation and 29 cases (76.3%) had ND3 mutation, respectively. In addition, this data also showed that 15 cases were found to contain mutations in both IDH2 and ND3 genes. However, there was no significant correlation between patients age, gender, race and histological brain tumor types with the IDH1 and ND3 mutation status. These results suggest that patients with the IDH1 and ND3 mutations would be susceptible or at the higher risk in developing brain tumor. Furthermore, both IDH1 and ND3 gene could be considered as a potential biomarker for brain tumor.

Keywords: Brain tumor, Somatic mitochondria DNA mutation, PCR-RFLP, IDH1, Mitochondrial ND3
Potential Anti-Proliferative Properties of Methanol and Water Extracts of *Pyrrosia piloselloides* on Human Cervical Carcinoma Cell Lines, Hela

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**ABSTRACT:** Cervical cancer is the third most commonly diagnosed cancer and the fourth leading cause of cancer death in female worldwide. Current estimates indicate that annually 2145 women are diagnosed with cervical cancer and 621 died from the disease. At present, the standard treatment for cervical carcinoma involves surgery, chemotherapy and radiotherapy. Combined chemotherapy using Cisplatin appears to be effective as its ability to initiate the apoptotic pathway. However, the use of Cisplatin is limited by its toxicity and acquired chemoresistance throughout the treatment. In this study, we investigated the potential anti-proliferative effects of methanol and water extracts of *Pyrrosia piloselloides* on HeLa cell lines. MTT assay was performed to determine the IC\textsubscript{50} concentration, whereby apoptosis analysis was done by flow cytometry to study the ability of the plant extracts to induce apoptosis in the cell lines. *P. piloselloides* methanol extracts (PPME) showed antiproliferative effect on HeLa cell lines with IC\textsubscript{50} of 16.25 µg/mL while *P. piloselloides* water extract (PPWE) showed no IC\textsubscript{50} value. However, both extracts showed no significant effect in apoptosis assessment. Identification of the chemical compounds exist in the extract was analysed by Gas Chromatography-Mass Spectrometry (GC-MS). Major compounds exist in PPME were 5-Hydroxymethylfurfural (23.13%), Allopurinol (8.66%) and 3,5-dihydroxy-6-methyl-2,3-dihydropyran-4-one (7.41%) while PPWE were Sulfolan-3-ol (10.06%), Linoleic acid (9.06%) and β-Sitosterol acetate (7.98%). Further study needs to be done to investigate the reason and mechanism of anti-proliferative effect of methanol extract on HeLa cell lines.

**Keywords:** Cervical cancer, *Pyrrosia piloselloides*, HeLa
The Determination of Cell Surface Phenotypes of LPS-Stimulated U937-Derived Microparticles

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ABSTRACT: Microparticles (MP) are cell vesicles that are produced by cells such as endothelial cells and platelets. These MP productions are triggered under certain circumstances such as apoptosis and activation of cells. The purpose of this project is to characterize the cell surface phenotype of monocytic MP (mMP) derived from U937 cells after being stimulated with LPS. In this study U937 cells were stimulated with 1ug/ml LPS for 18 and 24-hours. After LPS stimulation, cell viability was detected using Trypan blue exclusion on LPS-stimulated U937 cells. Both cell pellet and mMP were stained with CD14, CD11b and HLA-DR before being analysed by flow cytometry. As for mMP detection, cells were co-labeled with Annexin-V. Flow cytometry analysis showed that both U937 cells and mMP express CD11b and HLA-DR with slight expression of CD14. As mMP are originated from U937 cells, it is possible for both cells and mMP to express the same surface phenotypes. Furthermore, mMP were also positive for Annexin-V which is a marker of phosphatidylserine (PS). These PS are structure that belongs to the cell surface which are exposed after cell membrane asymmetry being destroyed in apoptosis by LPS. As mMP structure is derived from the cell membrane of U937 cells, it is possible for mMP to have PS expression on their surfaces which resemble their mother cells. In summary, LPS stimulates U937 cells to produce mMP under the condition of cell death or apoptosis as LPS mimicking inflammation. In future, these mMP can act as specific biomarkers for inflammation and this project could be the preliminary studies that characterized the mMP.

Keywords: Monocytic microparticles, Lipopolysaccharide, U937
The Timing of Action of Artemisinin, on the Malaria Parasite *Plasmodium falciparum*

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**ABSTRACT:** Malaria is one of the life-threatening diseases caused by *Plasmodium* species and currently treated by artemisinin and its derivatives from a class of endoperoxide antimalarial drugs. However, there is growing evidence that the malaria parasites are becoming more resistant to artemisinin. Therefore, studying the inhibitory activity of artemisinin enables several different inhibitory phenotypes to be defined. In this study, we sought to precisely determine the timing of action of artemisinin on *P. falciparum* by determining the inhibitory effect of this drug on intraerythrocytic development using SYBR Green I fluorescence-based drug sensitivity and microscopic assays. Artemisinin inhibited 3D7 strain malaria parasites with an IC$_{50}$ value of 17.05 ± 0.93 nM. Artemisinin appeared to have substantial activity against mid ring (~9 hour post-invasion), late trophozoite (~34 hour post-invasion) and late schizont (~44 hour post-invasion) stage parasites. Microscopic examination of the Giemsa-stained thin blood smears however revealed no major changes between artemisinin-treated and untreated cells. In conclusion, artemisinin was very effective at the early stage of the intraerythrocytic development of the parasite and in inhibiting the rupture of mature schizonts from releasing daughter merozoites.

**Keywords:** *P. falciparum*, Inhibitory effect, Artemisinin
Characterisation of Resealed Erythrocytes Containing High Molecular Weight Dextran, Tetramethylrhodamine Dextran

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\begin{abstract}
Haemoglobin metabolism during the intraerythrocytic stages of the malaria parasite, \textit{Plasmodium falciparum} is a preferable target in developing new antimalarial drugs, as interrupting processes involved in this metabolism would be fatal to the parasite. It has previously been reported that \textit{P. falciparum} ingests haemoglobin via mouth-like structures named cytostomes. Other studies, which most of them relying on a serial thin-section electron microscopy, revealed contrasting findings. In the present study, we aimed to re-examine the endocytic process of \textit{P. falciparum} by using a live cell imaging. Erythrocytes that were used throughout this study were collected into ethylenediaminetetraacetic acid (EDTA) anticoagulant tube that has been proven able to maintain the normal biconcave disk shape. The optimum protocols for lysis and resealing erythrocytes to entrap a high molecular weight tetramethylrhodamine-dextran (TMR-dextran) as well as the ability of resealed erythrocytes to support the growth of parasite were determined. An optimal 1:3 ratio of erythrocytes to haemolysis buffer volume permitted the retention of 33.56 ± 7.84\% of the original haemoglobin contents. Resealed erythrocytes at a 1:3 ratio showed a normal morphology comparable to the normal erythrocytes and were able to support the parasite growth and maturity.

Keywords: \textit{P. falciparum}, Erythrocytes, Live cell imaging
\end{abstract}
Generation of Erythroid Precursors from Hbe/Beta Thalassaemia Patients Using Peripheral Blood Mononuclear Cells

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ABSTRACT: Using CD34+ cells collected from blood to generate erythroid precursors need a relatively large initial volume of blood. Instead using a minimal blood volume to erythroid progenitors from mononuclear cells can be a good practice. This study aimed to generate erythroid progenitors form 1-2 ml of blood using StemSpan™ SFEM II media and Erythroid Expansion Supplement from both normal healthy subject and HbE/β thalassemia patient. Mononuclear cells (MNCs) were isolated from 1-2 ml of blood. 1-2 million MNCs was plated in 2ml of complete erythroid expansion media Media change was performed every 2 days. Flow cytometry was performed on day 14 using to evaluate differentiation. Flow cytometry on day 14; 94.2% and 39.5% of cells showed double positive for both CD71 and Glycophorin from healthy donor and and HbE/β thalassemia patient respectively. On other hand 1.8% and 60% were single positive for CD71 from healthy donor and HbE/β thalassemia patient respectively. In conclusion, erythroid precurors has been successfully developed from MNCs of both normal and HbE/β patient. The differentiation capacity was delayed in HbE/β patient compared to normal subject.

Keywords: HbE/β thalassemia, StemSpan™ SFEM II media, Mononuclear cells
The Relationship Between Schizophrenia and Rheumatoid Arthritis
Recrudesce: Genetic Analyses

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Since 8 decades ago, there were several studies on the relationship between schizophrenia (SCZ) and rheumatoid arthritis (RA) that shown the negative comorbidity among both diseases. The negative association arises when one allele from the same variant of one gene predispose to SZ and protects from having RA. Thus, the same gene possibly generates an opposing effect in both diseases. The main objective of this study is to investigate genetic variants that play a role in both rheumatoid arthritis and schizophrenia development in Malaysian population. We identified two SNPs which are rs9960767 and rs13219354; to investigate the association of the SNPs to SCZ and RA. We run PCR-RFLP to the DNA samples of 50 SCZ patients, 50 RA patients and 55 controls. We then analyze the data using online SHEsis software based on Hardy-Weinberg Equilibrium using Chi-square calculation with 95% confidence interval (CI) and P value <0.05 is considered statistically significant to investigate the contribution of the two SNPs to SCZ and RA. Our result showed genotype frequencies of rs 9960767 for SZ, RA and controls for AA are 94%, 96% and 94.5% respectively. AC genotype frequencies are 6% for SZ, 4% for RA and 5.5% for controls. However, none was found for allele CC in all groups. For second SNP (rs13219354), the genotype frequencies for CC were 100% for both SCZ and RA while for control was 98.2% with the remainder 1.8% in CT genotype. There were no significant associations observed between these two SNPs with both risk diseases. This current preliminary findings do not support our hypothesis that the relationship between RA and SCZ is explained by genetic factors. The protective effect of SCZ on RA may be due to other factors such as environmental factors and possibly small sample size was run from these study. However, a bigger sample size is needed to confirm this correlation.

Keywords: schizophrenia (SCZ), Rheumatoid arthritis (RA), PCR-RFLP
Morphological Improvements by *Syzygium Polyanthum* in Renal and Thoracic Aorta’s Histopathology of Hypertensive Rats

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**ABSTRACT:** *Syzygium polyanthum* or “serai kayu” is the herbs eaten raw by Kelantanese. The leaves are traditionally used to reduce blood pressure in hypertensive patient. Previous study has shown the *S. polyanthum* leaves extract significantly reduced the blood pressure in hypertensive rats. The objective of this study is to determine the effects of oral methanolic extract of *S. polyanthum* (MESP) leaves on histopathology changes induce by hypertension in spontaneous hypertensive rat’s (SHR) thoracic aorta and kidney. The period of the study was 4 weeks (sub-acute) where 15 male SHR were equally divided into 3 groups. Group 1 (MESP 2000 mg/kg), Group 2 (Losartan 10 mg/kg), Group 3 – untreated SHR. Five male normotensive Wistar-Kyoto (WKY) rats served as a negative control (Group 4). All rats were euthanized at the end of the study. Rat’s thoracic aorta and kidney were subjected to hematoxylin and eosin (H&E) staining; and scanning electron microscope (SEM). In MESP-treated thoracic aorta, the tunica adventitia and smooth muscle layer (tunica media) of thoracic aorta markedly improved to near-normal condition; and comparable to Losartan (H&E and SEM). In kidney, MESP and Losartan-treated SHR showed well-preserved glomerulus and well capsulated of Bowman’s capsule in both H&E and SEM. In conclusion, oral administrations of *S. polyanthum* extract able to improve the pathological changes in aorta and kidney secondary to hypertension, suggesting that a promising alternative treatment for hypertension.

**Keywords:** *S. polyanthum*, Hypertensive rats
The Phylogenetic Relationship of Marine Fish Species as Inferred from Mitochondrial DNA 16S rRNA Gene

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ABSTRACT: The traditional morphological method gives almost no clue about the genetic and evolutionary information of an organism. A molecular based method, especially involving mitochondrial DNA (mtDNA) genes as the genetic marker has provided the ideal platform for species identification, species delineation and evolutionary study. In this study, a partial sequence 570 bp of mtDNA 16S rRNA gene has been amplified and sequenced. Molecular relationship of 30 fish species was resolved by phylogenetic tree using Bioinformatics tools with a Neighbor-Joining, Maximum Likelihood and Maximum Parsimony methods. The result showed nucleotide similarities between the two species was ranging from 72% to 97% and the highest polymorphisms was observed in Chirocentrus dorab. Findings from phylogenetic trees showed two clear clustered was observed in MP tree. In all tree, Drepane longimana and Drepane punctate showed 100% bootstrap value indicated that these species are genetically very close with each other and that they might be originating from the same ancestor.

Keywords: phylogenetic relationship, marine fish, mitochondrial DNA, 16S rRNA
Voltammetry Determination of Hydroquinone Standard Solution using Boron-Doped Diamond Electrode

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ABSTRACT: A cyclic voltammetry (CV) of hydroquinone (HQ) standard in Britton-Robinson buffer (BRB) using Boron-Doped Diamond (BDD) electrode is illustrated. CV was conducted by anodic and cathodic potential scan from a range -1 to +1 V. The effect of pH of BRB within a range of pH 1 to 12 were studied on peak height and peak potential of the species. As increasing pH, peak potential of HQ shift more negative potential. The optimum pH of 1.03 BRB was chosen to study the effect of various scan rates and multiple sweeps on electrochemical behavior of HQ at BDD electrode. Various scan rates have been used while for effect of multiple sweep, 10 cycles have been applied. The effect of scan rate and multiple sweeps proved that the reaction of HQ was anodically irreversible reaction and no adsorption of HQ occured at BDD electrode. Analysis of real samples such as Babyface Solution 3 Anti-Acne/Keratolytic Depigmenting Agent and Nivea Night White Firming Body Serum in BRB pH 1.03 have been carried out using proposed method. The result showed that HQ content in Babyface was 1.67x10⁻³ % which is higher compared to Night White Nivea (0%). As conclusion, CV using BDD electrode is a good technique to determine the electrochemical behavior of HQ standard as well as for quantitative determination of HQ.

Keywords: Cyclic voltammetry, Britton-Robinson buffer, Boron-Doped Diamond (BDD) electrode and Hydroquinone
Determination of Sex from Palm Print Creases Density in Malay Population

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ABSTRACT: Identification of gender plays a vital role in forensic and medico legal investigations. Although several studies have been conducted to assess sex dimorphism in friction ridge skin characteristics, similar study has not been attempted yet using creases characteristics. The present study was undertaken to study the gender differences in creases density in Malay population. A novel method was employed by measuring creases density in 2 cm x 2 cm square at hypothenar region on palm print to evaluate its feasibility for sex identification. 53 subjects were included (16 males and 37 females) and results demonstrated that significant different occur in the creases density of both genders. Palm print mean creases density of 3.94 creases / 4cm² was calculated in males and a mean creases density of 6.29 creases / 4cm² found in females subjects. Results show that female tends to have a significantly higher creases density than male in the selected region. Applying the independent sample t-test, the differences in the creases density of males and females were found to be statistically significant (p =0.001) where mean difference lies between -3.68 and -1.02. Hence, it is evident that palm print creases density is a potential tool for sex identification, even from partial parts.

Keywords: Identification, palm print, creases density, gender differences
ABSTRACT: Wild animals are undomesticated living organism, live freely in the forest. Some of the species are threatened due to human activities. Conservation of the wild species is crucial since many of them are showing decrease in populations. Application of molecular method is compulsory in order to confirm the species along with morphological based identification. In this study, 17 caged wild animals species namely stump tailed macaque (Macaca arctoides), pig tailed macaque (Macaca nemestrina), Bornean Orang Utan (Pongo pygmaeus), Anubis baboon (Papio anubis), Malayan tiger (Panthera tigris), Striped hyena (Hyaena hyena), Puma (Felis concolor), African lion (Panthera leo), Spotted leopard (Panthera pardus), Malayan tapir (Tapirus indicus), Malayan sunbear (Helarctus malayanus), Brown bear (Ursus arctos), Asian elephant (Elephas maximus), Red lechwe (Kobus leche), Hog deer (Axis porcinus), Pangolin (Manis javanica), and Malayan peacock (Polyplectron malacense) were typed. The partial sequence of 700 bp mitochondrial DNA (mtDNA) cytochrome oxidase I (COI) was amplified and sequenced using newly designed primer. Sequence polymorphisms for all 17 species were tabulated and analysed using phylogenetic tree. Genetic relationship of 17 species was resolved using unrooted neighbor joining (NJ), maximum parsimony (MP) and maximum likelihood (ML) trees.

Keywords: Molecular characterization, wild animal, mitochondrial DNA Barcoding
The Relationships between Personality Traits and Aggressive Behaviour among Universiti Sains Malaysia Undergraduate Students

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ABSTRACT: The aim of this study was to examine the relationships between Alternative Five Factor Model (AFFM) personality traits and aggressive behavior among Universiti Sains Malaysia undergraduate students. The present study employed a cross-sectional research design with an aid of a self-administered questionnaire. The questionnaire comprised of two Malay validated psychometric instruments: Zuckerman-Kuhlman Personality Questionnaire Cross-Cultural 40 items (ZKPQ-M-40-CC) and Aggression Questionnaire (AQ-M-12). A total of 150 undergraduate students aged 19 to 25 years old from different courses were recruited in this study using a convenience sampling manner. Regression analyses viz. simple and multiple linear regression approaches were conducted in order to ascertain the relationships between personality traits and aggressive behavior. In this study, AFFM personality traits were operationalized as independent variables (predictors) while aggression subscales were operationalized as dependent variables (outcomes). The findings revealed significant relationships between certain personality traits and aggressive behavior. This study imparts statistical evidence on the role of personality traits as an important predictor of aggressive behavior.

Keywords: personality traits, aggressive behavior, students
Functional Ability of Masticatory Muscles in Different Malocclusion Cases Using Surface Electromyography (sEMG)

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ABSTRACT: A malocclusion is a misalignment or incorrect relation between the teeth of the two dental arches when they approach each other as the jaws close. Malocclusion can negatively affect masticatory process (like chewing, clenching) where masticatory muscle also get affected. It has been suggested that masticatory function varies in relation to different malocclusion (class I, II and III). The aim of this study was to assess the function of masticatory muscles (the masseter and temporalis muscles) in patient with different malocclusion by surface electromyography (sEMG). Subject group were refer to patients of School of Dental Science, Hospital Universiti Sains Malaysia (HUSM). The function of masticatory muscle were assessed by using sEMG and the results compared with gender and different malocclusions. A total 28 patients underwent the assessment (13 male and 15 female). Statistical analysis of parameters using Independent t-test showed significant difference (p<0.05) for male and female group in left masseter muscle during chewing and right temporalis muscle during clenching. Using ANOVA it showed no significant difference (p>0.05) for class I, II and III malocclusion, except right temporalis muscle showed significant difference (p=0.010) on clench. In conclusion, the function of the masticatory muscles were varies between male and female and different malocclusion (class I, II and III).

Keywords: Malocclusions, Masticatory muscles, Electromyography
Voltammetric Determination of Lead in Gunshot Residue Samples

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ABSTRACT: Gunshot residue (GSR) found in the mixture of combustible material in the ammunition consists of mainly three major elements; lead (Pb), antimony (Sn) and barium (Ba). Voltammetric techniques have been extensively used to analyze concentration of Pb in the sample by application of an electric potential. The distribution of Pb in (GSR) on the cloth target analyzed by voltammetric techniques within certain distances has been studied. The voltammetric parameters used to analyze the sample include the stirrer speed; 2000 rpm, equilibrium time; 5 min, pulse amplitude; 50 mV, start potential; -1500 mV, voltage step time; 0.6 s, sweep rate; 10 mV/s, under differential pulse mode. Using the stated parameters, the concentrations of Pb on the cloth targets were analyzed. The results showed that there were different concentrations of Pb found at the different locations of the targets with a range of 2.677 ± 0.106 ppb to 34.09 ± 0.114 ppb. The results obtained were compared with atomic absorption spectroscopy (AAS) technique which showed that the concentration of Pb obtained using former technique is higher than latter.

Keywords: gunshot residue (GSR), voltammetric techniques, cloth target, atomic absorption spectroscopy (AAS).
Parent Metallic Chemical Element Concentrations: A Detailed Study On Soil Content From Paddy Cultivation Areas In Kota Bharu, Kelantan

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ABSTRACT: Heavy metals known to be accumulated in plants adversely affect human health. The concentrations of five heavy metals which are Copper (Cu), Lead (Pb), Cadmium (Cd), Arsenic (As), and Manganese (Mn) in the soil were investigated from January 2016 until March 2016. The objectives of this study was to determine, analysis, and compare the heavy metals concentration level in paddy cultivation areas at Ladang Merdeka, Mulong and Padang Tengah, Salor. The factors that contribute to the level of heavy metals concentration also was determined from both sampling areas. The samples were digested using Acid Digestion Method and the heavy metals concentration were determined with atomic absorption spectrophotometer (AAS). The overall result shows that Mn has the highest concentration in Ladang Merdeka, Mulong (6.924) mg/L and Padang Tengah, Salor (5.516) mg/L. Meanwhile, Cd concentration shows the lowest concentration with (0.031) mg/L in Ladang Merdeka, Mulong and (0.036) mg/L in Padang Tengah, Salor. Statistical analysis of Mann Whitney test shows that there was significant differences between two paddy cultivation areas in all heavy metals except Arsenic (As). The concentration of Pb, Cd, Cu, and As in most soil samples from both sampling areas was recorded below the Department of Environmental (DOE) standards. Only Mn concentration from both sampling areas were exceeded the standard limit. In conclusion, it is important to keep systematic and continuous monitoring of heavy metals to manage and suppress such pollution.

Keywords: heavy metals, paddy fields, soils
**Air Quality in Library: Assessment of PM$_{10}$ and PM$_{2.5}$ Concentrations at Different Floor Levels of Universiti Sains Malaysia Health Campus’s Library**

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**ABSTRACT:** Library is one of the most frequent places visited by university students everyday. Many students favor to spend their time in library. Indoor exposure to air pollutants may occur in library. The purpose of this study is to assess the indoor air quality (IAQ) in library at USM Health Campus, Kota Bharu, Kelantan. The comparison of PM$_{10}$ and PM$_{2.5}$ concentrations between floor levels of library was determined. This study was also conducted to obtain the associations between PM$_{10}$ and PM$_{2.5}$ concentrations with number of occupants, temperature, relative humidity and total number of books. Particulate matter concentrations were measured at library by using Handheld 3016 IAQ Particle Counter. The data was collected for eight hour for each floor with five minutes time interval. Based on Kruskal Wallis test, there was significant differences of PM$_{2.5}$ and PM$_{10}$ concentrations between floor levels ($p<0.05$). Number of occupants had significant associations with PM$_{2.5}$ concentration through Spearman Correlation test ($p<0.05$). Furthermore, there was also a significant association between temperature and relative humidity with PM$_{10}$ and PM$_{2.5}$ concentrations. However, the correlation between particulate matter concentration with temperature and relative humidity were poor ($r$-PM$_{10}$=0.22, $r$-PM$_{2.5}$=-0.15; $r$-PM$_{10}$=-0.17, $r$-PM$_{2.5}$=0.2). Number of books and different floor surface area of library can be contributing factor too. In conclusion, regular cleaning and housekeeping activities in library need to be done to minimize IAQ problems and to provide a healthier indoor environment.

**Keywords:** indoor air quality, particulate matter, PM$_{10}$, PM$_{2.5}$
Pesticide Exposure and Neurobehavioural Effect among Paddy Farmers

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ABSTRACT: This comparative cross sectional study design aimed to determine association between pesticide exposure and neurobehavioral effects among paddy farmers. A study on the effect of pesticide exposure on the neurobehavioral among paddy farmers was conducted at agriculture area in Kuala Terengganu; Manir, Gong Pauh and Maras. Two groups of 44 paddy farmers (exposed) and 43 administrative workers (non-exposed) were recruited by simple random sampling method. Socio-demographic, work data, health status and neurobehavioural symptoms were obtained through questionnaire and neurobehavioural effects were assessed using Neurobehavioral Core Test Battery (NCTB). Higher frequency of neurobehavioural symptoms such as feel tired after work (66.7%), difficulty to sleep at night (52.9%) and lack in hand coordination (63.6%), were observed among the exposed. There was a significant association of poor memory with job experiences (OR = 4.92, CI : 1.24 - 19.48) and headache with age (OR = 1.14, CI : 1.02 - 1.29). Age was significantly associated with Simple Reaction Time (b = -0.45, p =0.004), Minnesota Dexterity (Dominant) (b = -0.44, p = 0.007), Minnesota Dexterity (Non-Dominant) (b = -0.35, p = 0.008), Digit Symbol (b = -0.24, p = 0.029), Pursuit Aiming Test (b = -0.27, p = 0.008) and Trail Making Test (b = -0.44, p = 0.017). Job experiences was significantly associated with Simple Reaction Time (b = 3.19, p = 0.04) and Pursuit Aiming Test (b = -3.02 p <0.001) while education level was significantly associated with Digit Symbol (b = 3.44, p<0.01). In conclusion, exposed subjects score poorer than non exposed subjects whether in neurobehavioral symptoms or neurobehavioral score.

Keywords: pesticide, pesticide exposure, neurobehavioral symptom, NCT
Prevalence and Risk Factors on Work-Related Musculoskeletal Discomforts Among Nurses in Hospital Universiti Sains Malaysia

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ABSTRACT: A cross sectional study was conducted to determine the prevalence and risk factors to Work-Related Musculoskeletal Discomforts (WRMDs) among nurses in Hospital Universiti Sains Malaysia. A set of questionnaires were distributed among the respondents to seek information on variables of study. This study found that predominant body regions on WRMDs within 12 months were ankles/feet (35.6%), neck (33.3%) and lower back (31.3%). Upper back, shoulders, knees, wrists/hands, and hips/thighs were the less reported pain by nurses with 28.9%, 22.2%, 20%, 17.7% and 13.3% respectively. Ankles/feet pain was the commonest complaint among the respondents. Shoulder pain was significantly associated with gender ($\chi^2 = 9.129$, $p = 0.010$) and heavy lifting techniques ($\chi^2 = 6.544$, $p = 0.011$). Housework routine was significantly associated with neck pain ($\chi^2 = 4.486$, $p = 0.041$), wrists/hand pain ($\chi^2 = 10.317$, $p = 0.016$) and upper back pain ($\chi^2 = 5.152$, $p = 0.023$). Lower back was significantly associated with psychosocial ($\chi^2 = 4.394$, $p = 0.036$). Neck pain was significantly associated with marital status ($\chi^2 = 6.544$, $p = 0.011$) and having children ($\chi^2 = 4.549$, $p = 0.033$). Upperback pain was significantly associated with having children ($\chi^2 = 4.549$, $p = 0.033$). In addition, change position of patient in bed, carry the patient to and from the toilet and repetitive work posture were the work characteristics that contributed to knee pain ($\chi^2 = 8.372$, $p = 0.004$). In conclusion, the prevalence of WRMDs among the nurses was more than 50% and was comparable to other studies. Thus greater concern by the administration and individual are able to control severe WRMDs in nursing professionals.

Keywords: risk factor, work related musculoskeletal discomfort, nurses
Knowledge, Attitude and Practice Towards Blood and Body Fluid Exposure among Students in Health Campus, Universiti Sains Malaysia

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ABSTRACT: The burden of exposure to blood-borne pathogens (such as HIV, hepatitis B and C viruses) is considerable for healthcare workers. Healthcare workers include all individuals, including students and trainees, whose activities involve contact with blood or body fluids from patients. The aim of this study is to determine the prevalence of awareness towards blood and body fluid exposure among students in Health Campus, Universiti Sains Malaysia. A self-administered questionnaire has been completed by 158 students from February to April of Year 2016 to fulfill the study objectives. Overall respondents consisted of 67 students from School of Medical Science (42.4%) 56 from School of Dental Science (35.4%) and 35 from Nursing Programme (22.2%). The dental students had displayed the highest percentage (67.9%) who scored highest point for each part. Total respondents’ knowledge of blood-borne disease/infection was also classified under good level. Although percentage of the students had knowledge of “hand washing after accidental contact with blood and body fluid may help to reduce the infection risk” is more than 95%, but the number of student were practicing that is lower and significant (p=0.019). In conclusion, medical, dental and nursing students of Universiti Sains Malaysia Health Campus have satisfactory knowledge, attitude and practice towards blood and body fluid exposure.

Keywords: Knowledge, Attitude, Practice, Healthcare workers, blood and body fluid exposure
Sex Determination of Burnt Teeth Samples by Nested PCR of Amelogenin (AMEL) Gene

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ABSTRACT: There are many available methods for sex identification such as forensic anthropology and conventional DNA typing methods. In this paper, nested PCR technique will be employed in sex typing of burnt teeth samples based on the amelogenin gene. Teeth samples collected will be subjected to burning at different temperatures ranging from 100°C to 500°C, at 2-10 minutes. The whole tooth was used for DNA extraction by employing the phenol-chloroform method. Sex typing using external primer showed that only 5% of the samples were correctly typed. More conclusive results were shown by internal primer with 75% of the samples were successfully typed. Factors such as degraded DNA materials and the presence of caries in the tooth greatly affects the typing results as the DNA amount obtained is lesser compared to sound tooth. Selective amplification of the shorter X gene in the amelogenin also might give rise to difficulties in DNA typing as the larger PCR product is absent. Nested PCR proved to be a good method that can be carried out when dealing with highly degraded DNA materials as the concentration of DNA greatly increased upon nested PCR which makes sex typing possible. Teeth remain as a good source to obtain DNA even the samples are greatly damaged or burnt.

Keywords: sex determination; nested PCR; amelogenin gene; burnt teeth
Identification of Bacteria from Local Vegetables through PCR-RFLP of Mitochondrial 16s rRNA Gene

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ABSTRACT: Foodborne disease is one of the growing public health problems occurred worldwide including in Malaysia. The common causes of foodborne disease due to microorganisms, chemical and bio-toxin which are found in raw or lightly cooked vegetables. In this study, ten local vegetables, namely spinach (bayam), water spinach (kangkong), white flowering cabbage (sawi manis), chinese broccoli (kalian), cabbage (kobis), tomato (tomato), sweet potato (keledek), eggplant (terung), long beans (kacang panjang) and chili (cili) were selected for the identification of bacteria through PCR-RFLP of mitochondrial 16S rRNA gene. A new primer was designed based on mitochondrial 16S rRNA gene sequences of selected bacteria, such as Pseudomonas syringae, P. protegens, Listeria monocytogenes, Salmonella enterica, Erwinia amylovora, E. carotovora, Bacillus cereus, B. subtilis, B. licheniformis and Escherichia coli. A partial sequence of 16S rRNA gene was PCR amplified and digested by endonuclease enzymes Alu I, Hha I, Hae III and EcoR I. Identification of bacteria was assigned based on species-specific variation pattern produced from digested product.

Keywords: mitochondrial 16S rRNA, PCR-RFLP, vegetable, bacteria identification
ABSTRACT: Pens have been used as tools to make alterations on documents during the act of forgery. The emergence of hybrid pen inks which exhibits both characteristics of gel pen and ballpoint pen inks has imposed challenges to ink discrimination. Therefore, this study aims to compare the physical and chemical characteristics of blue ballpoint pen inks and gel pen inks of similar hue through their ink profiles generated by three different techniques, namely video spectral comparator (VSC), FTIR-ATR and thin layer chromatography (TLC). Ten blue ballpoint pens and ten blue gel pen inks were chosen randomly regardless of brands. Optical examination using VSC-6000, thin layer chromatography using two different solvent systems and FTIR-ATR spectroscopy were employed to analyse all the samples. Results of FTIR-ATR and VSC microspectroscopy were statistically analysed using principal component analysis (PCA) and hierarchical cluster analysis (HCA) to ease comparison and discrimination. The results show that the ink profiles of the pens which were created by combining the fluorescent characteristics, FTIR spectra and ink solubility of gel pens and ballpoint pens vary despite the fact that all the pens visually appear to be of the same colour. This indicated that a combination of techniques provided better discrimination among the samples tested.

Keywords: ink profiling, ballpoint pen inks, gel pen inks, VSC, FTIR-ATR, TLC
Evaluation of Sound Level Meter Applications for Quarry Site Safety

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ABSTRACT: Noise-induced hearing loss (NIHL), resulting from overexposure to loud sounds, is becoming increasingly prevalent among employees. Regulations established by the federal government recommend a maximum sound exposure level of 90 dBA for 8 hours, with an exchange rate of 5 dBA. Although sound level meters and dosimeters are accurate at measuring noise levels, they are expensive and inaccessible to common workers. Smartphones, on the other hand, are widely available to the average consumer and contain various downloadable sound level meter applications (SLM apps). SLM apps may be a more cost-effective solution to determining noise levels in various environments. This study examined the accuracy of four different free SLM apps on 3 different Android smartphones. Measurements of noise were taken from four different sources at JKR Kuari Pusat Bukit Buloh. Results indicated that 2 SLM apps which are SPL Meter and iNVH in Lenovo model were the most accurate in determining noise levels in control environment (below 80 dBA) but inaccurate when applied at quarry site. Therefore, while SLM apps may be used on smartphones to help evaluate the noise conditions of a working environment, they may have limitations in their accuracy at higher level. Audiologists are advised to validate sound level meter applications against proper sound level meters across input levels prior to use.

Keywords: noise induced hearing loss, quarry, Android, SLM apps
Talent Identification in Sepak Takraw: From a Coach Perspective

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ABSTRACT: Talent identification and selection for potential future athlete has been widely practice in most sporting context. Coaches have their own set of criteria when they are on the hunt for potential athletes. However, these selection criteria are very subjective and have not been well documented in sepak takraw. Therefore, the main objective of this study was to explore the talent identification criteria of sepak takraw players from a coach perspective. Seven male (n=7) developmental level coaches participated in the current study (age: 40-53 years old; coaching experience: 10-24 years). Face-to-face semi-structured interviews were carried out to obtain in-depth information from all the coaches. The result of the study showed that there were three main themes that emerged from the interview on how coaches identify potential players; (1) skill of the game, (2) physical demand and (3) mental and emotional skill of the players. Skill of the game were classified into two sub-themes (i.e. basic skills and specific skills), meanwhile physical demand was categorised based on position (i.e. height of the players) and finally emotional and mental skills were divided into two sub-themes that consist of outside competition (i.e. passion) and during competition (i.e. mental toughness and focus). Finding from the study concluded that most of the coaches emphasised the important of game skills ability compared to physical and mental and emotional skills. However, physical and psychological skills were also important to help the players perform to their best.

Keywords: talent identification, sepak takraw, coach perspective
Recovery Study of Dangerous Drugs in Soft Drinks using Liquid-Liquid Extraction

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\textbf{ABSTRACT}: Raves and night clubs are always associate the recreational drugs, which are also referred as ‘club drugs’. Dissolving illegal drugs, such as ketamine and MDMA, into liquid forms to be disguised as bottled soft drinks is one of the current drug concealment methods. Hence, a recovery study to develop suitable method for detection and quantification of the amount of specific drugs contained in the soft drinks is proposed. The objective of this study is to study the recovery efficiency, in term of precision and accuracy, of liquid-liquid extraction (LLE) method used to extract drugs from the soft drinks. LLE with chloroform allowed the extraction of ketamine and MDMA from the sample soft drinks. Gas Chromatography–Mass Spectrometry (GC-MS) analysis was used to confirm the presence of desired drugs in the extracts, followed by Gas Chromatography–Flame Ionisation Detector (GC-FID) analysis to quantify the amount of desired drugs extracted from the soft drinks. In GC-MS analysis, it was found that the mass spectrum qualities of MDMA (78%) was lower compared to ketamine (98%) and internal standard (91%). In precision study by GC-FID analysis, it was found that the amount of drugs recovered were consistent for blackcurrant juice (%SD = 6.77%) and ice lemon tea (%SD = 5.38%), but inconsistent for green tea (%SD = 15.52%) and orange juice (%SD = 29.43%). In accuracy study, the recovery percentage of ketamine, from blackcurrant juice, for low-level-spiked sample and high-level-spiked sample were 83.22% and 91.31% respectively. The regression curve of measured concentration against spiked concentration of ketamine was found to be sufficiently linear (R\textsuperscript{2} = 0.997), which indicated that the method was accurate. In brief, the analytical procedures of LLE, coupled with GC-MS and GC-FID in recovery study were found precise and accurate for the extraction, detection and quantitation of ketamine and MDMA in the drug-laced soft drinks.

\textbf{Keywords}: Recovery study; ketamine; MDMA; liquid-liquid extraction; gas chromatography-mass spectrometry; gas chromatography-flame ionising detector; quantification of drugs
A Preliminary Study of Subjective Visual Vertical (SVVT) Test among Normal Adults

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ABSTRACT: Subjective Visual Vertical Test (SVVT) is good, cheap and fast clinical tool to assess vestibular disorder. This test one of valuable test for dizziness patients especially in determining the status of the utricle and saccule. This study will provide a normative value for normal adult of SVVT that can be used by the clinician in the future. This is a cross-sectional and prospective study. We recruited 95 subjects 48 female and 47 males with age 36.66 (9.799) from three different age group. The equipment used are Subjective Vertical test software 1.3.0, 7-inch computer screen, chair, eye goggle, computer and questionnaire (Malay Version of Vertigo Symptom Scale (MVVSS). SVVT measures the patient's subjective perception of vertical. This test is generally performed in complete darkness and requires the patient to adjust a vertical line (usually via remote control) so the line is perceived to be straight up. There are no significant different between the average SVVT for normal, dotted and arrow line and different age groups. In view pattern of normal line (plain line) and dotted line (string of beads) of Subjective Visual Horizontal Test (SVHT) suggests that the test can be performed in all different ages at least from 20 years old up to 50 years old. There is no age’s bias in the Subjective Visual Horizontal Test (SVHT) and this suggests that this test is a good and reliable test to assess the vestibular organs.

Keywords: Dizziness, Subjective Visual Vertical Test, Utricle, Saccule, Vestibular organ
The Effects of Background Noise Levels on Auditory Brainstem Response (ABR) Evoked by Clicks and CE Chirp in Healthy Young Adults Ages 18-30 Years Old

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ABSTRACT: Auditory Brainstem Responses (ABR) test is used widely for neonatal hearing screening as well as for diagnostic hearing measure. The effect of background noise on ABR is still understudied. This study aims to determine the effects of different levels of background noise on CE-Chirps and click stimulus among healthy young adult ages 18-30 years old. This is a repeated-measure study with consecutive consenting of 22 young adults (n=22, Male=45% and Female=55%). The results were analysed based on numbers of normal ears (n=44). There is no significant difference between right and left ears (P > 0.05). Male subjects (n=10) shows significantly greater ABR results (P < 0.05) for amplitude when evoked by clicks and shorter latency when evoked by both clicks and CE-chirps compared to female subjects (n=12). The ABR latency are affected in low, moderate and high level noise for both clicks and CE-chirps (P < 0.05) whereas ABR amplitude for clicks and CE-chirps are only significantly affected in high level noise (P < 0.05). In conclusion, background noise levels and ABR evoked by clicks and CE-chirps are highly associated. Significant effect of ABR results were observed when measured in high level noise. Therefore, it is important to ensure that whenever ABR is conducted, high level of background noise should take into consideration.

Keywords: background noise level, Auditory Brainstem Response, clicks and CE-chirps
Respirable Dust Exposure (Pm$_{2.5}$) and Respiratory Health among Male Quarry Workers, Kelantan

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ABSTRACT: Exposure to workplace dust was a common problem associated with respiratory illness and has been an area of research interest for the last decades. A cross sectional study was carried out to determine the association of respirable dust exposure (PM$_{2.5}$) and respiratory health among male quarry workers. A study was conducted among 50 male quarry workers and 50 male administrative workers. The investigation included spirometric testing and detailed personal interviews using structured questionnaire adopted from British Medical Research Council (BMRC) Questionnaire on respiratory symptom. Personal exposure of respirable dust was measured among the quarry workers. Mean for personal monitoring of respirable dust among exposed group was higher at grinding bunker section (0.26±0.26 mg/m$^3$). The result was exceeding permissible exposure limit (PEL) (0.10mg/m$^3$) 8 hours Time Weighted Average (TWA-8h) according to US Occupational Safety and Health Administrative (OSHA) and Control of Substances Hazardous to Health Regulations 2002. Respiratory symptoms commonly reported by male quarry workers were phlegm (46.0%), dyspnea (36.0%), cough (32.0%) and chest tightness (22.0%). Age had significant relationship with the dyspnea (Adj OR: 1.564, CI 95%: 1.049, 2.333). There was a significant different of %FEV$_1$/FVC between quarry workers and control group. Smoking was significantly associated with FVC ($b$=-0.412, $p<0.05$) while age was significantly associated with FEV$_1$ ($b$=-0.026, $p<0.05$) and %FEV1/FVC ($b$=-0.416, $p<0.05$). In conclusion, there was no association between respirable dust exposure (PM$_{2.5}$) and respiratory health among the quarry workers. Hence, improvement on engineering control and work practices modifications should be done to overcome the problem.

Keywords: respirable dust exposure, respiratory symptoms, lung function
A Trend Analysis of Tuberculosis Infection in Malaysia

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ABSTRACT: Infection of Tuberculosis (TB) would become a major threat to public health if there are insufficient attention and integrated initiatives being carried out to control and overcome the disease. Hence, this paper discusses the trend of tuberculosis contagion in Malaysia with regards to period in Post-Independence until 1990 and post 1990 until 2014, in which each has its own significant occurrences. The country has gone through critical phase in dealing with the disease in 1960s with many actions taken by the government to control this epidemic from worsening such as formulation and implementation of National TB Control Program in 1961. The program included provision of health services and facilities to the public, vaccination program and health education. The vertical approach provided TB management among its own dedicated staff. These efforts have impacted on strategic TB patients’ management and proved successful which is reflected in the number of reduction in term of reported TB cases within the period of 1960 until 1985. Although TB control programme performance at the global stage had improved in prevalence and mortality which shows a declining trend since 1995, a different turn of event occurred within the period of 1990 to 2014 in Malaysia which showed an increment in TB cases that contributed by several factors such as the urbanisation process, influx of immigrants, intensification of case screening and detection and improvement of public awareness and knowledge on TB. In order to formulate effective strategies to control TB infection in Malaysia, the extent and nature of such events need to be understood by conducting a trend analysis to detect significant variation of constraints over time.

Keywords: Malaysia, National TB Control Program, policy, trend analysis, tuberculosis infection
Social Determinants of Tuberculosis Contagion in Malaysia

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ABSTRACT: Tuberculosis (TB) is primarily an airborne disease caused by the infection of a bacterium, Mycobacterium tuberculosis which results more than two million deaths per year. TB infection is spread when someone with active infectious TB coughs or sneezes. In Malaysia, TB is fast rising as a non-communicable disease, with a death rate higher than that of dengue. For instance, in 2015 Health Indicators reported by Ministry of Health, mortality rate for TB was 5.33% compared to Dengue Haemorrhagic Fever 0.71%. Hence, this study attempts to review the social determinants of TB transmission in Malaysia. This study employs a qualitative approach. Data collected through in-depth interviews. Each interview was recorded, transcribed and analysed using content analysis technique. The study finds that social determinants of TB transmission are related with the following factors: improper residential design, unhealthy lifestyle, inconvenient working environment, negative public perception and stigma and financial issue. Other social determinants are also in the forms of lack of knowledge and education and shortcoming in monitoring foreign labour. The identification of as many TB contributing factors possible is crucial in developing and implementing integrated programs and initiatives that involve all stakeholders in addressing and curbing the disease from spreading.

Keywords: Contagion, Malaysia, social determinants, tuberculosis.
Knowledge, Attitude and Practice towards Distracted Driving Related to Road Accident among Students in School of Health Science, Universiti Sains Malaysia

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ABSTRACT: Driving is a multitasking operation that involves manual, visual, and cognitive tasks. However, drivers often tend to perform non-driving activities that divert their attention from the primary task of driving due to drivers’ interaction with in-vehicle sources such as conversing with passenger, using mobile phone, drinking or eating, or adjusting the radio or other vehicle controls. The importance of knowledge, attitude and practice of road safety measures needs to be emphasized in the prevention of road traffic accidents (RTAs). The present study is aimed to assess the knowledge, attitude and practice of distracted driving related to road accident measures among the students in school of health sciences, USM, Malaysia. A total of 186 final year students were included in this cross-sectional study. A structured questionnaire was used to collect the relevant information from the participants. The data collected was analyzed using SPSS version 22.0. Out of the 186 participants, 160 (86.0 %) were females and 26 (14.0 %) were males. Overall, students have good knowledge 131(70.4 %), average attitude 132(70.9 %) and average practice 133(71.5 %). The results showed significant driving experience effect with regard to practice towards distracted driving related to road accident with higher score of practice in group of diving experience less than 2 years (30.17 ± 5.51) than driving experience more than two years (28.02 ± 5.42). There was significant correlation between practice and accident with p value of 0.006. Future research will help to provide better risk estimates and insights regarding the role of distraction in crash causation.

Keywords: distracted driving, road accident
Ergonomics Risk Assessment and Symptoms of Musculoskeletal Disorders among Female Production Lines Operators in Semiconductor Factory

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ABSTRACT: The ergonomics risk factors were associated with symptoms of MSDs. This study was conducted to investigate the ergonomics risk assessment and symptoms of Musculoskeletal Disorders (MSDs) among female production lines operators in semiconductor factory. The level of the MSDs risk among female production lines operators were identified through Rapid Entire Body Assessment (REBA). The associations were identified by using chi-square test. Questionnaires were distributed to 144 respondents with guidance from researcher. Respondents’ movements and postures during several work cycles were observed. Results showed that MSDs risk for overall respondents were 77.1% with medium risk, followed by 18.8% with high risk and 4.2% with low risk. In addition, the body region that showed high percentage of pain and discomfort were ankles/feet (91.0%), lower legs (90.3%), shoulders (83.3%), upper back (81.9%) and neck (81.3%). Prolonged neck bending forward (93.8%) and repetitive movements of arms/hands (93.8%) were the highest ergonomics risk factor related to work. Moreover, prolonged standing (89.6%), working with hand above shoulders (86.8%) and carrying heavy loads (83.3%) also contributed to the ergonomic risk. There were significant associations between location of pain and discomfort with ergonomics risk factors. As conclusion, there was symptoms of MSD present among the respondent and these may affect quality of life of the workers.

Keywords: ergonomics risk assessment, REBA, working posture, ergonomics risk factors, symptoms of musculoskeletal disorders, semiconductor factory
Noise Exposure And Hearing Effects Among Cement Factory Workers

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ABSTRACT: This cross sectional study design aimed to determine the association between noise exposure and usage of hearing protection device with the NIHL and hearing loss symptoms among cement factory workers. A total of 35 cement manufactory factory workers were recruited using convenient and simple random sampling. Questionnaires were distributed to obtain their sociodemographic, work data and hearing symptoms. Area and personal monitoring were conducted using noise dosimeter (Larson Davis Spark 106 RC) to determine their workplace noise exposure levels. Audiometric test results were obtained with the permission from the company. The area monitoring shows the mean noise level at coal mill and cement mill were 95.3±8.63 dBA and 95.1±6.89 dBA respectively. The median of personal noise exposure level among worker was 86.3 dBA (IQR: 79.20-92.60 dBA). The prevalence of NIHL among 19 of them was 79% (n=15). There were no significant association between hearing protection device and noise exposure with the NIHL and hearing loss symptoms among the subjects. Although there were no significant relationship established however the noise levels were found to exceed the action levels of 85 dBA. Therefore, it is important to increase the effectiveness of hearing protection program in the factory as well as to educate the workers on the importance of maintaining their hearing health.

Keywords: Noise monitoring, NIHL
Knowledge and Practices towards Hand Hygiene among Pediatric Nurses at Hospital Universiti Sains Malaysia

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ABSTRACT: The most important factor in the prevention and control of nosocomial infections is with appropriate hand hygiene practice by healthcare workers. Knowledge and practices towards hand hygiene is essential in order to enhance the prevention or reduction of healthcare associated infections. The objective of this descriptive and cross-sectional study was to identify knowledge and practices towards hand hygiene among pediatric nurses in Hospital Universiti Sains Malaysia. A total of 66 respondents were selected using purposive sampling method. The data was obtained using a self-administered questionnaire which consisted of three sections. In section one there were five demographic characteristics, in section two and three there were nine with a 5-Likert type questionnaires in each to determine respondents’ level of knowledge and practices on hand hygiene. The data were processed with SPSS version 22.0 to analyze descriptive statistics, Chi Square test and Spearman rho’s correlation for answering the research questions. This study showed that respondents’ had excellent level of knowledge (70% excellent and 30% good knowledge level) and excellent practice level of hand hygiene (70% excellent and 30% good practice level). However, there was no significant relationship between socio-demographic variables and knowledge level (p>0.05) towards hand hygiene. But there was a significant correlation between knowledge and practices (r=1.000, p<0.01). This showed that there was positive relationship between the respondents’ knowledge and practices whereby higher knowledge associated with excellent practices of hand hygiene. Overall, the findings of this study revealed that nurses must have good knowledge and practice level to sustain good hand hygiene to prevent cross infections in wards.

Keywords: hand hygiene, nosocomial infections, pediatric nurses
ABSTRACT: The family caregiver has roles in providing practical, financial, social, and emotional support for sick family member. Currently, cancer care is increasingly shifts from inpatient to outpatient settings. Simultaneously, it may affect the family caregiver’s burden. This study investigates burden’s domains of family caregivers among cancer patients underwent chemotherapy at Hospital USM, Kelantan. The association of family caregiver’s burden with occupational status was also identified and lastly, the relationship between family caregiver’s burden and age was also assessed. A cross-sectional design was used for 110 family caregivers of cancer patients underwent chemotherapy from December 2015 to February 2016. The samples were recruited from three oncology wards. Data were collected using a 24-item Caregiver Reaction Assessment to measure domains of caregiver self-esteem (CE, 7 items), lack of family support (LFS, 5 items), impact of finances (IF, 3 items), impact on schedule (IS, 5 items) and impact on health (IH, 4 items). Highest mean score was for caregiver self-esteem domain (3.99, SD 0.35) that indicated a lower burden. In addition, there was a significant association between family caregiver’s occupational status and caregiver self-esteem domain (p=0.001), significant correlation between family caregiver’s age and caregiver self-esteem, lack of family support, impact of finances, impact on schedule and impact on health (p<0.05). Family caregivers were affected in all domains studied during providing care for their sick family members. Additionally, the occupational status and age were factors contributing to caregivers’ burden. It is recommended that caregiver’s burden should be addressed urgently for the benefits of both family caregivers and the patients.

Keyword: family caregiver, burden, cancer, chemotherapy
Microbiological Quality of Fresh Coconut Milk Sampled from Selected Processed Coconut Vendors in Kota Bharu, Kelantan

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ABSTRACT: Fresh coconut milk is widely used in cooking and also in ready-to-eat food preparations. However, issues pertaining to its microbiological quality and safety for consumption remains doubtful as it is prone to microbial contamination and has been associated with foodborne diseases. A study was conducted to evaluate the microbiological quality viz. total plate count (TPC), total coliform count (TCC) and faecal coliform of 50 fresh coconut milk samples randomly obtained from 10 selected vendors in Kota Bharu, Kelantan wet markets from October 2015 until February 2016. All 50 samples (100%) showed unsatisfactory results for total plate count and total coliform count which exceeded the proposed acceptable guidelines for ready-to-eat food. A total of 17 (34%) samples showed presence of faecal coliform and E.coli was identified in all these samples. Since all samples were unsatisfactory in TPC and TCC whilst faecal contamination was detected in 8 out of 10 vendors, we may conclude that the fresh coconut milk sold in the market have unsatisfactory microbiological quality and thus unsafe for consumption.

Keywords: fresh coconut milk, microbiological quality, total plate count, total coliform count, faecal coliform count and E.coli
Assessing The Level of Lead, Cadmium and Arsenic among Farmers in KADA Agricultural Area, Kelantan

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ABSTRACT: Heavy metals, particularly cadmium, lead, and arsenic, constitute a significant potential threat to human health. This study was conducted to determine the concentration of lead, cadmium and arsenic in nail samples from farmers at Kemubu Agricultural Development Authority (KADA), Kelantan, Malaysia. A total of 35 farmers and 35 USM Health Campus’s staffs (control group) had participated in this study. Post sampling, the fingernails samples were digested using acid digestion and then analysed by Atomic Absorption spectrometry (AAS). Checklist was given to participants to get demographic, health status, and their agricultural activities data. In this study, the concentration of heavy metals was within the normal range and varies according to demographic factors. The result showed that concentration of lead, cadmium and arsenic are significant different in exposed group as compared to control group (p < 0.05). There were also significant correlations (p < 0.01) between age and concentration of lead (r = 0.317), arsenic (r=0.326) respectively and cadmium (r = 0.257, p < 0.05). Furthermore, the findings suggested that agricultural activities could contribute to the accumulation of those heavy metals in farmers. Hence, the control of human exposure to these metals to prevent adverse health effects is still an important public health issue. In conclusion, lead, cadmium and arsenic concentration among farmers are lower compared to the allowable limit and the farmers should practice good agricultural practice to prevent the heavy metal exposure in their body.

Keywords: Farmers, heavy metals, fingernail, pesticide and fertiliser
Assessing the Concentration of Heavy Metals (Lead, Cadmium And Nickel) in Selected Personal Care Products and Urine among the Targeted Consumer

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ABSTRACT: Personal care products (PCP) are widely known and regularly used by people, often on a daily life, as well as in industry and commercial. In some countries, there are no strong regulations on safety of ingredients. Some heavy metals are used in the personal care product as ingredients, while most of others are contaminants. This study was conducted to assess the concentration of heavy metals in various types of PCP including deodorant, lipstick, shampoo and hand and body lotion and in 19 urine samples of targeted consumer. Eight products of different brands in the markets were analyzed. Determination of lead (Pb), cadmium (Cd) and nickel (Ni) was done by pre treatment of samples by acid digestion using concentrated HNO₃ and HClO₄, prior to analyse using Atomic Absorption Spectrophotometer (AAS). Results showed that, the highest mean concentration of Pb, Cd and Ni was in deodorant with 0.262 mg/L, lipstick with 0.005 mg/L and hand and body lotion with 0.048 mg/L respectively. Trace amount of heavy metal found in urine and no association observed between types and frequency of product used and concentration of all metals in urine on the targeted consumer with (p > 0.05). Even though, the trace amount of heavy metal were under permissible limit, factors such as smoking status, nutritional status, drinking water, exposed to smoke vehicle might explain the occurrence in human body. All the metals in PCP of selected brand are present under the safe limits.

Keywords: Personal care product, heavy metal, urine
**Heat Exposure and Physiological Changes among Cooks in Kubang Kerian, Kelantan**

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**ABSTRACT:** This study aimed to determine the association between Wet-bulb Globe Temperature (WBGT) area levels with the physiological changes that include body core temperature, blood pressure and heart rate of cooks. This cross-sectional study design utilised purposive sampling method to recruit 24 cooks from cafeterias namely Murni, Nurani and food stall outside the Health Campus Universiti Sains Malaysia. For area heat measurement, WBGT was mounted on a tripod at height of 1.1 m and was placed near the source of heat for 8 hours. For physiological changes measurement, body core temperature, blood pressure, and heart rate were taken three times per day at pre-shift, mid-shift and post-shift. Respondents’ personal information, health history, work description, and symptoms of heat related illness were asked using questionnaire. Four sampling sites had exceeded the permissible threshold WBGT level of 28.0 ° Celsius. There was a significant different of body core temperature (p=0.016) and heart rate (p=0.004) between pre-shift and post-shift. There was no significant correlation (p>0.05) between WBGT index with body core temperature at pre-shift and mid-shift, but there is a slightly significant association for post-shift (p=0.053). Such increase may be attributed by heat exposure. There was no significant association between body core temperature and blood pressure (systolic and diastolic) and with heart rate (p>0.05). For sociodemographic factor, only age showed significant association with the body core temperature. Preventive measures of heat stress at work such as suitable personal clothing and drink more fluid is highly recommended.

**Keywords:** Wet-bulb Globe Temperature, physiological changes, body core temperature, blood pressure, heart rate
Physical Activity And Quality Of Life Among Breast Cancer Patient In Hospital Universiti Sains Malaysia

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ABSTRACT: Breast cancer (BC), is a common form of cancer and the second most common cause of death among women in the world. Previous studies showed positive association between physical activity level and quality of life (QoL). The aim of this study was to determine level of physical activity and QoL among breast cancer patient in oncology unit at tertiary hospital. A cross-sectional design was used in this study. From December 2015 until February 2016, 73 respondents were recruited in by non-probability purposive sampling. Godin Leisure Time Physical Activity Questionnaire, EORTC QLQ-C30 and EORTC QLQ-BR23 questionnaire were used to collect the data. Data was analyzed using the Statistical Package for the Social Sciences (SPSS) version 20.0. Pearson Chi Square analyses were conducted to explore the association between socio-demographic data and physical activity and quality of life. A p value of ≤ 0.05 was considered statistically significant. Although there was no association between physical activity and QoL, participants in this study have good QoL (mean score 70.55, SD 22.14) and were insufficiently active (53.4%, n=39). There was a significant association between cancer stage and current cancer treatment with QoL. There was a significant association between marital status, educational status, occupation, monthly income, cancer stage and current treatment with physical activity. This study underlined the importance of physical activity towards achieving the public health recommendation and improved the QoL among breast cancer patient.

Keywords: physical activity, quality of life, breast cancer
Beliefs and Usage of Complementary and Alternative Medicine among Cancer Patients in Hospital Universiti Sains Malaysia

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ABSTRACT: The prevalence of cancer cases showed an increasing trend over the years. Complementary and alternative medicine (CAM) is among popular choice of treatment among cancer patients. The aim of this study was to determine the beliefs and usage of CAM among cancer patients in Hospital USM. A cross-sectional design was used in this study. Eighty six participants were recruited in this study using non-probability purposive sampling. Data was collected from December 2015 until February 2016 using self-administered questionnaire. Pearson Chi Square analyses were used to explore the association between socio-demographic data, medical data and beliefs and usage of CAM. A p value of ≤ 0.05 was considered statistically significant. Majority of the participants in this study (65.1%, n=56) currently used CAM. Most of the CAM users used biological based therapies (53.6%, n=30), while the others used mind-body medicine approach (46.4%, n=26). The findings showed no significant association between socio-demographic characteristics on beliefs and usage of CAM. This study found that there was a significant association between medical characteristic (cancer types, current cancer treatment and comorbidities) and beliefs and usage of CAM. This study revealed the beliefs and usage of CAM was prominent among cancer patients in Hospital USM, thus highlighting a greater need for patient education regarding CAM therapies and their potential interactions with conventional therapies.

Keywords: CAM, Cancer patients, beliefs, use
Knowledge and Attitude Towards Vaginal Delivery and Cesarean Section among Primigravida Hospital Universiti Sains Malaysia

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ABSTRACT: As first time mother, primigravida might have different knowledge and attitude towards vaginal delivery (VD) and cesarean section (CS). A cross sectional, descriptive statistic study was carried out to assess knowledge and attitude towards VD and CS among primigravida. A total of 105 primigravida attending antenatal visit in teaching hospital completed self-administered questionnaires. Sampling was done using non-probability purposive sampling technique. Data was analyzed using the software package SPSS version 22. Statistical significance was considered at p value <0.005. This study found that majority of the participants have good knowledge towards VD and CS (51.4%, n=54). Chi Square test showed a significant association between monthly household income with level of knowledge towards VD and CS among primigravida (p=0.022). This study found no association between other socio-demographic characteristics (age, highest education level and occupational status) with knowledge on VD and CS. For attitude towards VD and CS, the current study found no association with socio-demographic characteristics (age, monthly household income, highest education level and occupational status). Chi Square test showed a significant association between the level of knowledge and attitude towards VD (p=0.025). In conclusion, the study findings show a need for educating pregnant women, especially among primigravida about the pros and cons of different modes of delivery to maternal and perinatal health.

Keywords: Mode of delivery, primigravida, vaginal delivery, cesarean section, knowledge and attitude
**Current Status of Radiation Protection and Safety in Hospital USM**

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**ABSTRACT:** Noise-induced hearing loss (NIHL), resulting from overexposure to loud sounds, is becoming increasingly prevalent among employees. Regulations established by the federal government recommend a maximum sound exposure level of 90 dBA for 8 hours, with an exchange rate of 5 dBA. Although sound level meters and dosimeters are accurate at measuring noise levels, they are expensive and inaccessible to common workers. Smartphones, on the other hand, are widely available to the average consumer and contain various downloadable sound level meter applications (SLM apps). SLM apps may be a more cost-effective solution to determining noise levels in various environments. This study examined the accuracy of four different free SLM apps on 3 different Android smartphones. Measurements of noise were taken from four different sources at JKR Kuari Pusat Bukit Buloh. Results indicated that 2 SLM apps which are SPL Meter and iNVH in Lenovo model were the most accurate in determining noise levels in control environment (below 80 dBA) but inaccurate when applied at quarry site. Therefore, while SLM apps may be used on smartphones to help evaluate the noise conditions of a working environment, they may have limitations in their accuracy at higher level. Audiologists are advised to validate sound level meter applications against proper sound level meters across input levels prior to use.

**Keywords:** noise induced hearing loss, quarry, Android, SLM apps
ABSTRACT: Minimal cross-cultural studies addressed the manifestation of dental anxiety. Sweden has multicultural society with settlement of immigrants. Despite improvement in oral health of Swedish population, immigrants have poor oral health and health care utilization. Avoidance of comprehensive care is significant consequence of dental anxiety, leading to deterioration of oral health, causing more pain and more avoidance. This vicious cycle is of dental is a public health concern. The aims of this cross-sectional study were to determine the prevalence of dental anxiety among its consequences and self-rated oral health conditions among Arab immigrants living in Malmö, Sweden. The study further determined the relationship between dental anxiety, dental problems and dental attendance based on sequence of vicious cycle of anxiety. The Arabic version of MDAS with questions on socio-demography, self-reported oral health and use of dental services were administered to a random sample of 442 individuals at Rosengard shopping mall in Malmö. The Arabic version of MDAS is reliable with Cronbach's alpha of 0.920. Prevalence of dental anxiety is 23.8%, with 5.9% being highly anxious and 3.8% being extremely anxious. Six factors associated with dental anxiety: being female, irregular dental attendance and symptom-driven dental visits, perceiving bad oral health status, having missing teeth and perceived dental treatment need (p<0.05), consistent with vicious cycle of dental anxiety. This study is the first done among Arab immigrants in Sweden. Therefore, more extensive should be performed to further investigate factors that predict oral health care status and utilization by immigrants. Vigorous oral health promotion campaign should also be considered.

Keywords: dental anxiety, arab immigrant, oral health
Knowledge and Practices Towards Hand Hygiene Among Pediatric Nurses at Hospital USM

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ABSTRACT: The most important factor in the prevention and control of nosocomial infections is with appropriate hand hygiene practice by healthcare workers. Knowledge and practices towards hand hygiene is essential in order to enhance the prevention or reduction of health care associated infections. The objective of this descriptive and cross-sectional study was to identify knowledge and practices towards hand hygiene among pediatric nurses in Hospital USM. A total of 66 respondents were selected using purposive sampling method. The data was obtained using a self-administered questionnaire which consisted of three sections. In section one there were five demographic characteristics, in section two and three there were nine with a 5-Likert type questionnaires in each to determine respondents’ level of knowledge and practices on hand hygiene. The data were processed with SPSS version 22.0 to analyze descriptive statistics, Chi Square test and Spearman rho’s correlation for answering the research questions. This study showed that respondents’ had excellent level of knowledge (70% excellent and 30% good knowledge level) and excellent practice level of hand hygiene (70% excellent and 30% good practice level). However, there was no significant relationship between socio-demographic variables and knowledge level (p>0.05) towards hand hygiene. But there was a significant correlation between knowledge and practices (r=1.000, p<0.01). This showed that there was positive relationship between the respondents’ knowledge and practices whereby higher knowledge associated with excellent practices of hand hygiene. Overall, the findings of this study revealed that nurses must have good knowledge and practice level to sustain good hand hygiene to prevent cross infections in wards.

Keywords: Hygiene practice, Nurse
The Effect of Using Individual Self-Guided Breathing Device with Imagery Training among Novice and Skill Athletes

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ABSTRACT: Breathing patterns often get disrupted under stress situations. Trained breathing pattern in individual can have a profound effect on self-regulation for reducing anxiety level. The aim of this study is to examine the effect of using self-guided breathing device with imagery training between Novice and Skilled netballers. The participants were (n=13) novices, and (n=13) skilled netballers, completed the Sport imagery ability measure (SIAM), self-efficacy shooting scale, competitive state anxiety inventory (CSAI-2R), and breathing rate counters. A pre-test shooting netball performance was conducted before the intervention, and a post-test shooting netball performance was conducted. The results showed that all the participants had acceptable imagery abilities level. Skilled netballers showed a significant increase in self-efficacy shooting scale \( p = 0.015 \) from 370.00 during pre-test to 503.85 during post-test, but no significant difference were observed in novice netballers, with \( p = 0.249 \). There also no significant difference in somatic anxiety and cognitive anxiety, \( p= 0.026 \) and \( p= 0.004 \) respectively. For self-confidence in anxiety state showed a significant difference, \( p= 0.621 \) for both novice and skilled netballers. However, no significant difference were observed between both groups, \( t(26) = 0.094, p = 0.926 \) for netball shooting performance. For the breathing rate, gain scores for both groups showed more (-ve) value than (+ve) value, meaning, breathing rate throughout the 12 sessions was decreased in both research conditions. The applied perspectives will be discussed.

Keywords: Breathing patterns, Imagery, Anxiety, Netballers
The Effect of Individualised Self-Talk during Imagery on Netball Performance

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ABSTRACT: Studies showed that imagery is a widely used psychological skills for enhancing sporting performance, and some findings have also showed that individualised self-talk can help athletes to overcome anxiety, leading to improving athletes’ performance. The aim of this study is to investigate the effect of individualised self-talk during imagery on netball shooting performance. A total of N=28 female participants participated in this study. They were assigned to 2 groups, namely Individualised self-talk during imagery group (n=15) and the control group (n=13). A pre-test shooting netball performance was conducted before the intervention, and a post-test shooting netball performance was conducted after participants completed their 12 sessions of individualised self-talk during imagery. Participants’ completed the Sport Imagery Ability Measurement (SIAM), Rosenberg Self-Esteem Scale, and Revised Competitive State Anxiety Inventory 2 (CSAI-2R). The results showed that the participants had acceptable imagery skills, on which they scored a total mean score of 720.35 points. There were significant difference between four weeks for cognitive state anxiety with \( p = 0.009 \) but no significant were observed in somatic anxiety, self-confidence, and netball shooting performance, with \( p = 0.986; \ p = 0.971, \) and \( p = 0.735 \) respectively, although some positive results were observed. In conclusion, this study showed some positive effects of using individualised self-talk during imagery intervention. The applied perspectives will be discussed.

Keywords: self-talk, imagery, anxiety, self-confidence
Exploring the Relationship of Food Preferences and Body Mass Index among School Children in Kelantan

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ABSTRACT: Research has shown that children’s food preferences predict their food consumption patterns. The food preferences of young children could be related to their risk of becoming obese later in life. This study examines the relationship between children’s preferences of commonly food served at school canteen and their body mass index (BMI). A cross-sectional survey was given to 196 primary school children in Kelantan. Through the modified stacking box method that showed 23 photographs of foods commonly served at school canteen, the children were asked to rank the foods in order of their preferences. BMI-for-age were also calculated. Analysis of association by Spearman's rank order were used. Among the children, 9.2% were categorized as overweight and 16.3% were thinness based on WHO 2007 growth reference. A significant negative correlation was observed between BMI and preferences for kuih pau (rs = -0.153, P<0.05). This means BMI increased with reduced food preferences. On the other hand, BMI was positively associated with preferences for ubi kentang goreng (rs = 0.150 P<0.05) and roti goreng sosej (rs = 0.151, P<0.05). Children with high preferable for processed foods were found to be at risk of being overweight. Most of the recommended foods by Healthy School Canteen Management Guidelines 2011 were least preferred by children. Therefore, more efforts toward strict enforcement for the existing health food policies, improve accessibility to tasty health foods and increase barriers to unhealthy foods at school canteens must be taken.

Keywords: Children, Food preferences, Body mass index (BMI)
The Effectiveness of Breastfeeding Intervention on Breastfeeding Confidence among Primiparous Mothers in Hospital Universiti Sains Malaysia

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ABSTRACT: In Malaysia, even though more awareness campaigns on the benefits of breastfeeding were conducted among the public and mothers especially, the results of exclusive breastfeeding still remain low than the rate recommended by World Health Organization. The decisions to initiate and continue breastfeeding were influenced by the mother’s confidence in her body’s ability to adequately nourish her infant. The objective of this study was to compare the effect of breastfeeding intervention on breastfeeding self-efficacy in the first week postpartum between the intervention group and the control group. A quasi-experimental design was used to test the effects of intervention on breastfeeding confidence. A purposive sample of 96 primigravida mothers (intervention group (IG) =48, control group (CG) =48) had been recruited from the Obstetrics and Gynaecology clinic and antenatal ward at Hospital USM. Data were collected using the Breastfeeding Self-Efficacy Scale-Short Form (BSES-SF) and the breastfeeding assessment questionnaire. Mothers in the IG received usual care and two hours of additional education programme on breastfeeding. Mothers in CG received the usual care only. Mothers in the IG had greater breastfeeding self-efficacy score (M=57.19, SD=6.49) than mothers in the CG (M=53.85, SD=7.50), p=0.023. The frequency of each item in BSES-SF was analysed and the results showed the mean of high scoring items for BSES-SF in the intervention group was 37.78 (SD=3.56), which was higher compared to the control group at 31.14 (SD=4.15). In conclusion, this study showed that mothers who were received breastfeeding intervention had a significant effect on breastfeeding self-efficacy scores.

Keywords: Breastfeeding, Intervention, Breastfeeding Self-Efficacy Scale-Short Form (BSES-SF)
Practices and Challenges in Solid Waste Management in Malaysia

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ABSTRACT: Solid waste can be defined as unwanted residual solid waste or semi-solid material as results from industrial, commercial, agricultural and community operations. With the extreme increase of the amount of waste being generated every day, it is expected for the amount to rise even drastically by the year 2020 due to the rapid increase of the population and urbanization as well as changes in consumption pattern. Thus, solid waste management becomes one of Malaysia’s most critical and controversial environmental issues. Therefore, waste minimization, including source reduction and recycling must be promoted among Malaysian. This paper aims to evaluate the management of solid waste in Malaysia by highlighting the current waste management system implemented in Malaysia and the challenges in applying the concept of sustainability into solid waste management through reviewing past similar researches. This paper involved with related secondary data on waste issues which are collected from journals, proceedings, books, related agencies and internet sources as well. The results obtained show the current solid waste management systems applied in Malaysia in which is handled by several government agencies from federal to state and local authorities. This review also demonstrated that the policies, practitioners and technologies are not enough to cope with the current situation to meet with the sustainable solid waste management. A strategic supply chain for the sustainable solid waste management system has to be embedded. All parties must take their parts in nurturing a common vision to avoid the environmental degradation. However the main elements which needs to solve in order to achieve sustainability in solid waste management are top-level organisation commitment, adequate financial and technical resources, active involvement from public and the enforcement of stringent environmental legislation as well.

Keywords: Practices, Challenges, Solid Waste Management, Malaysia
Preconception Care among Women Attending Booking in Kelantan

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ABSTRACT: Pregnancy and its risks are a familiar subject among women especially in the reproductive age. Therefore, preconception care is introduced with the aims to promote health before conception and improve the pregnancy-related outcome. Hence, knowledge, attitude and practice among women in reproductive age towards the preconception care are important. This study was conducted to determine the level of knowledge, attitude and practice and their correlation on preconception care among women attending booking. This is a cross sectional study conducted from April to December 2012 at Klinik Kesihatan Bachok. Self-administered questionnaire was used and it involved 135 respondents aged from 18 years to 45 years. The questionnaire consisted of four domains which are socio-demographic data, knowledge, attitude and practice on preconception care. The mean (SD) score of knowledge, attitude and practice are 11.37 (3.94), 15.39 (2.12) and 10.13 (2.30) respectively. Ninety eight point five percent (98.5%) of the respondents have good attitudes, 45.2% have good practices and 51.9% of the respondents have good knowledge on preconception care. The women in Bachok have inadequate knowledge and poor practise towards preconception care. However they have good attitude towards the preconception care.

Keywords: Knowledge, Attitude, Practise, Preconception Care, Reproductive Age
ABSTRACT: Performing regular physical activity contributes advantages to psychosocial health, functional ability and general quality of life (QoL). It also helps to control body weight, reduce the risk of chronic diseases such as coronary heart disease, some type of cancers, type 2 diabetes as well as strengthen our bones and muscles. The objective of the present study was to evaluate the current score of physical activity among overweight and obese school children Kota Bharu, Kelantan, Malaysia. Physical activity assessment were measured using Physical Activity Questionnaire for Older Children (PAQ-C). PAQ-C is a self-administered with 7-day recall instrument which suitable for students aged 8 to 14 years. It provides a summary of physical activity score derived from nine items, each scored on a 5-point scale. A score of 1 indicates low PA, whereas a score of 5 indicates high PA. Descriptive statistics and parametric test were used in SPSS. One hundred and thirty nine Year Five students from 14 schools in Kota Bharu participated (overweight=18.7%; obese=81.3%) this study with mean body mass index of 26.10 (SD=3.63). Out of total respondents, 61.9% were boys and 53.2% came from suburban area. Significantly higher score of performing physical activity was exhibited among boys (mean=2.6; SD=0.60) as compared to girls (mean=2.37; SD=0.51). Similar finding was noted among those who stay in urban area (mean=2.68; SD=0.60) compared to those from suburban area (mean=2.47; SD=0.56). As school children spent most of their time at school, thus it can be an opportunity for implementation of exercise intervention is highly recommended.

Keywords: Physical activity, Overweight and obese school children, Physical Activity Questionnaire for Older Children (PAQ-C)
Baseline Findings on Nutrition Knowledge, Attitude and Practice (NKAP) Regarding Obesity among Overweight and Obese School Children In Kota Bharu, Kelantan

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ABSTRACT: In order to promote healthier eating habits and therefore reduce the prevalence of obesity, knowledge about food and nutrition is believed to play an important role. As the previous data were a bit behind, the current data are needed to provide valuable data in developing nutrition education programme later that contribute to nutritional well-being of overweight and obese children. The purpose of this study was to evaluate the current nutrition knowledge, attitude and practice (NKAP) among overweight and obese school children Kota Bharu, Kelantan. A self-administered questionnaire on demographic and NKAP were used. The NKAPQ consisted of 3 section: i) knowledge - 22 multiple-choice questions; ii) attitude – 6 responses and iii) practice – 10 questions. Higher score indicated better nutrition knowledge, attitude and practice of the respondents. Descriptive statistics and multivariate analysis of variance (MANOVA) were used in SPSS. A total of 139 year five students from 14 schools in Kota Bharu participated the study (overweight=18.7%; obese=81.3%). The mean weight and body mass index (BMI) were 54.99 kg and 26.14 kg/m2 respectively. There is a significant association between breakfast frequency and practice score, Pillai’s Trace=0.177, F (6, 264) = 4.269, p<0.001. However, no substantial interaction was noted between gender, BMI status and breakfast frequency [F (21, 378) = 0.313, p = 0.162]. The prevalence of obesity among school children in the study is a matter of concern. Effective nutrition education intervention strategies should be carried out to combat the problem before it becomes an epidemic.

Keywords: Nutrition Knowledge, Attitude and Practice (NKAP), overweight and obese school children
Diabetic Retinopathy Screening in USM Diabetic Centre

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ABSTRACT: This study aims to determine the percentage of diabetic retinopathy among diabetes mellitus patients that referred to Diabetic Centre Hospital Universiti Sains Malaysia (USM) for screening of diabetic retinopathy using non-mydriatic fundus camera. This is a cross sectional study conducted in Hospital USM. All diabetic patients that referred to Diabetic Centre Hospital USM for screening of diabetic retinopathy between October 2014 and December 2014 were included. Non-mydriatic fundus camera was used for screening of diabetic retinopathy. A total of 231 diabetic patients were screened. Majority of the patients had type 2 diabetes mellitus which accounts 99% (n = 229). About 1% (n = 2) has type 1 diabetes mellitus. The percentage of diabetic patients has diabetic retinopathy is only 9% (n = 21) and 78% (n = 180) of diabetic patients have no diabetic retinopathy. Out of 21 patients that have diabetic retinopathy, 86% (n = 18) had non proliferative diabetic retinopathy, 10% (n = 2) had diabetic maculopathy while 4% (n = 1) had proliferative diabetic retinopathy. Early detection of diabetic retinopathy depends on educating patients with diabetes as well as their families, friends, and health care providers about the importance of regular eye examination even though the patient may be asymptomatic.

Keywords: Diabetic retinopathy, Diabetic Centre Hospital USM
Knowledge of Dengue among Community in Kubang Kerian, Kelantan

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ABSTRACT: Dengue cases have become an important public health concerns in Malaysia. A gradual upsurge were seen in the number of dengue cases in Kubang Kerian, one of the many localities recognized as dengue endemic areas with periodic dengue outbreaks. Knowledge may pace alarm, recognize life threatening features and improve the outcome of dengue control. The aim of this study was to investigate the dengue related knowledge level of community of Kubang Kerian, Kelantan. A cross-sectional survey using a structured, validated questionnaire was conducted among community in Kubang Kerian. Community were sampled by simple random sampling. The survey consisted of questions regarding socio-demographic data and knowledge regarding danger signs and symptoms of dengue fever. Knowledge score and demographic characteristics of community were analysed. Analyses included descriptive statistics and Pearson chi-square test. One hundred and seventy-five residents completed the survey. Findings shows that community had moderate knowledge level (52.8%) related to dengue fever. Results revealed a significant association between knowledge on sign and symptoms of dengue with level of education (p=0.001), monthly income (p=0.004) and dengue experience (p=0.001). It can be concluded that knowledge about dengue is inadequate. Therefore, concerted effort by healthcare professionals and the Ministry of Health Malaysia authorities is needed to educate community to identify the sign and symptoms of dengue and to improve their health seeking behaviour for prompt public health intervention.

Keywords: Dengue; Knowledge, Community, Prevention
Attitudes Regarding Breast Cancer Genetic Testing: A Survey Of Hospital USM Nurses

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**ABSTRACT**: Breast and ovarian cancers are a public health issues and are the most common cancer-related death among women in Malaysia. The perspective of nurses towards breast cancer genetic testing that are available is unexplored in Malaysia. The aim of this study was to investigate the attitudes of nurses regarding breast cancer genetic testing. A cross-sectional study was utilized. Nurses working in Hospital USM were recruited via simple random sampling and 150 nurses completed the study. The survey instrument, socio-demographic and a Likert type questionnaire consisting of nurses’ attitudes about breast cancer genetic testing and BRCA1/2 were used to collect data. Analyses included descriptive statistic and Pearson chi-square test. In the nurse sample, we found slightly more than half of participants (54.7\%) were uncertain about BRCA1/2 genetic testing and 16.7\% were sceptical toward breast cancer genetic testing. A significant association was found between gender (p=0.016), years of clinical working experiences (p=0.001), speciality of experience (p=0.001) and attitudes. In the light of our results most nurses expressed unsure and cynical about breast cancer genetic testing. It is concluded that there is certainly a need for more information and education about breast cancer genetic testing.

**Keywords**: Genetic testing, Breast Cancer, BRCA1/2, Attitudes, Perspectives
Weight Status and Physical Activity among Adolescents Residents in Orphanage Home in Kuala Terengganu

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ABSTRACT: A cross sectional study was conducted among 58 adolescents residing in an orphanage home in Kuala Terengganu, Terengganu. The objective of this study was to determine the weight status and physical activity among adolescents aged 10 to 14 years old. Anthropometric measurements such as height and weight were taken to determine weight status. Physical activity were determined using Physical Activity Questionnaire for older children (PAQ-C). Data were analyzed using SPSS version 17.0. This study indicated that the majority (62.1%) of subjects were categorized with normal BMI, 15.5% were overweight, 15.5% were obese and 6.9% were underweight respectively. More of the male respondents are overweight (77.8%) compared to female respondents (22.2%). Female respondents showed higher percentage in obese category (66.7%) compared to male respondents (33.3%). Mean physical activity score was 2.46±0.8. The highest proportions of the respondents (48.3%) were in low physical activity category while 41.4% were in moderate physical activity category and 10.3% were in high physical activity category respectively. The association between physical activity level and weight status was not significant ( X2 value = 4.680, p value = 0.585). Male respondents were significantly more physically active than females, significant ( X2 value = 30.59, p value < 0.001) with more male respondents (83.3%) than female respondents (16.7%) in moderate and high physical activity level category. This study showed the need for physical activity intervention to promote regular physical activity particularly among adolescents.

Keywords: Adolescents, Weight status, Physical activity
Knowledge and Behaviour Towards Salt Intake among Adult Patients Getting Treatment in Outpatients Clinic Hospital USM

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ABSTRACT: Sodium chloride (salt) is widely used in people’s food as an additive or preservatives to make food tastes better and lasts longer. The knowledge and behaviour towards sodium chloride (salt) intake has become a question mark. The purpose of the study to determine the knowledge and behaviour towards sodium chloride (salt) intake among adult patients getting treatment in Outpatients Clinic Hospital USM. A cross-sectional study was conducted on 186 adult patients getting treatment at Outpatients Clinic Hospital USM, using convenience sampling. A pilot study was conducted using Pan American Health Organization (PAHO) questionnaires. The questions contains dichotomous and Likert scale questions types, thus yielded higher Standardized Items Chronbach’s Alpha compared to Chronbach’s Alpha alone. Knowledge towards sodium chloride (salt) intake yielded Standardized Items Chronbach’s Alpha of 0.520 and Chronbach’s Alpha of 0.387. Behaviour towards sodium chloride (salt) intake yielded Standardized Items Chronbach’s Alpha of 0.519 and Chronbach’s Alpha of 0.394. There was no significant association between knowledge and behaviour towards sodium chloride (salt) intake using independent t-test, p-value>0.136. However, there is a significant association between knowledge towards sodium chloride (salt) intake with education level using One Way ANOVA, p-value<0.002, and there is a significant association between knowledge towards sodium chloride (salt) intake with gender using Independent t-test, p-value<0.012. In conclusion, the findings showed that knowledge and behavior does not affect the intake of sodium chloride (salt) and future research with larger sample size should be conducted.

Keywords: Knowledge, Behavior, Salt Intake
Knowledge and Awareness of Breast Cancer among Postnatal Patients in Hospital Universiti Sains Malaysia

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ABSTRACT: Breast cancer is the most commonly diagnosed malignancy and the second leading cause of cancer-related death among women across the globe. Fortunately, one third of all cancers can be prevented if diagnosed at an early stage. The aim of this was to determine the level knowledge and awareness of breast cancer among postnatal patients in Hospital USM, Kubang Kerian, Kelantan. A total of 110 postnatal patients who admitted to the postnatal ward in Hospital USM were studied. A self-administered questionnaire, The Breast Cancer Knowledge and Awareness that used in this study was modified based of the original questionnaire. The questionnaires were distributed to the participants by probability, simple random sampling methods. The data was analyzed by SPSS 22. Results showed that 80.9% of participants have high level of knowledge, and only 19.1% have low level of knowledge. Whereas, 92.7% of participants have high level of awareness. However, Pearson Chi Square and Fisher Exact test showed there was no association between age and family history of breast cancer with level of knowledge (p=0.434 and 0.191) and awareness of breast cancer (p=0.95). The history of breast problem and family history of breast cancer also were not associated with the level of awareness towards breast cancer. However there was highly significant association between the level of education and level of awareness with p value < 0.001, but age was found not associated with level of awareness. In conclusion, the study showed that the participants in the study population have adequate knowledge and awareness towards of breast cancer symptoms, risk factors and early detection methods. The postnatal patients more understand about the importance of healthy behavior, but early detection measures to recognize the signs and symptoms, risk factors and screening tests still need to be emphasizing in order to decrease mortality rate due to breast cancer.

Keywords: Breast cancer, Knowledge And Awareness, Postnatal Patients
Iron Supplementation Compliance among Pregnant Mother at Hospital USM

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ABSTRACT: Iron deficiency is the most common nutritional deficiency globally. Pregnant mothers are at a particular risk of iron deficiency because of the increasing body demand during that period. Iron requirement during pregnancy is increasing as it is needed to help in red blood cell production. Iron supplementation during pregnancy has been recommended for women in the developing country included Malaysia. The main objective of this study is to determine the iron supplementation compliance among pregnant mother at Hospital USM based on their knowledge, attitude and practice. This cross sectional study was conducted among 136 pregnant mothers who visited Antenatal Clinic at Hospital USM. The respondents were selected randomly and self-administered questionnaire was used for data collection. The result of the study showed that 88% of the total respondents have good level of knowledge, 74.6% from the total respondents have positive attitudes and 79.4% of respondents was categorized on having good practice on iron supplementation intake. Based on the analysis using Statistical Package for Social Science (SPSS), the only associated variable toward iron supplementation compliance is respondent’s knowledge about iron supplementation. From the total score, 75% of the respondents were categorized as strictly compliance toward iron supplementation intake, 22.8% were categorized as partially compliance and another 2.2% of the total respondents were categorized as not compliance. As a conclusion, most of the respondents have good knowledge with positive attitude and practice on iron supplementation during pregnancy in the study population. The parameters reflect to the level of compliance among pregnant mother toward iron supplementation intake.

Keywords: Iron supplement, Pregnancy, Knowledge levels, Attitudes, Practices, Compliance
Job Stress and Burnout Potential among Nurses at Hospital USM

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ABSTRACT: Stress is defined as a situation or feeling competent when a person recognized that demands exceed the personal and communal resources the individual is able to organize. It is a common to see nurses face stress with heavy workloads involving physical and mental stress, death and dying situation, inadequate preparation of knowledge, lack of knowledge, lack of staff support, uncertainty concerning treatment and conflict among staff members and physician. This cross-sectional study determines the association of job stress and burnout potential among nurses at Hospital USM. In addition, 122 staff nurses from medical, surgery and A&E department were studied. A self-administered questionnaires used in this study was Nursing Stress Scale and Burnout Potential Inventory, which distributed to the respondents by non-probability, purposive sampling method. The data was analyzed by SPSS 22. The results showed that the percentage of nurses have low stress with low burnout potential was 80% while the rest 18.9% have low stress and medium burnout potential. Furthermore, there were 49% nurses have low stress and high workload while the rest 51% nurses have low stress and low workload. Pearson’s Chi-Square test showed that there was significant association between job stress and burnout potential (p=0.032) and between job stress and workload (p=0.001). However, there was no significant association between socio-demographic factors (marital status, total family income per month and education level) and job stress. Conclusion, job stress is significantly related to burnout potential among nurses in the study population.

Keywords: Job stress, Burnout Potential, Nurses
Comparison of Antimicrobial Activity of Crude Extracts of Five Different Plants from Kelantan, Malaysia Against Acne Inducing Bacteria

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ABSTRACT: Acne vulgaris is a typical skin disorder among adolescence, causing inflammation of pilosebaceous follicle which characterized by comedones, papules, pustules, cysts, nodules and often scars in face, neck, upper trunk and also arms. \textit{Propionibacterium acnes} and \textit{Staphylococcus epidermidis} have been recognized that play as a major role in acne formation. This study was conducted to compare the antimicrobial activity of five ethanolic plant extracts namely \textit{Piper betle}, \textit{Aloe vera}, \textit{Solanum lycopersicum}, \textit{Cinnamomum zeylanicum} and \textit{Cucumis sativus} against \textit{P. acnes} and \textit{S. epidermidis}. The well diffusion assay was used to determine the sensitivity of the samples, while the liquid dilution method was used for the determination of the minimal inhibition concentration (MIC). Doxycycline was used as a reference standard. The results of the antimicrobial activity tests revealed that all extracts of the plants showed the antimicrobial activities against \textit{P. acnes} and \textit{S. epidermidis}, respectively. \textit{Piper betle} extract showed a remarkable antibacterial activity compared to other plant extracts. The results of present investigation appear to indicate that the ethanolic extracts of the five traditional plants would be good candidates for treatment of \textit{P. acnes} and \textit{S. epidermidis} infections.

Keywords: Acne vulgaris, \textit{Propionibacterium acnes}, \textit{Staphylococcus epidermidis}, Antibacterial activity
Antibacterial Activity of Asiaticoside against *Klebsiella pneumoniae* and *Pseudomonas aeruginosa*

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**ABSTRACT:** Asiaticoside is the most active compound of *Centella asiatica* that extensively studied due to their valuable medicinal properties such as anti-bacteria, anti-ulcer, anti-aging and anti-inflammatory. Although the potential of asiaticoside as anti-bacterial agent has been reported in many studies, the knowledge regarding the effect of asiaticoside on certain Gram negative bacteria is still lacking. In this study, *in vitro* anti-bacterial activity of asiaticoside was evaluated against two Gram negative bacteria, *Klebsiella pneumoniae* and *Pseudomonas aeruginosa* using the disc diffusion method. The active compound was dissolved in 1:10 DMSO and diluted to 1 mg/ml as a stock solution. The stock solution was further diluted to 0.5 mg/ml, 0.25 mg/ml, 0.125 mg/ml and 0.0625 mg/ml. Amoxicillin (30 μg/ disc) was used as a positive control while the impregnated disc with sterile distilled water served as a negative control. Overall, the results showed that the active compound showed the highest inhibitory activity against *Pseudomonas aeruginosa* with inhibition zone ranging from 70 mm to 100 mm compared to *Klebsiella pneumoniae* which showed inhibitory zone ranging from 70 mm to 90 mm. In conclusion, this study revealed that asiaticoside can be used to inhibit the growth of *Klebsiella pneumoniae* and *Pseudomonas aeruginosa*, however the inhibitory effect was higher against *Pseudomonas aeruginosa* than *Klebsiella pneumoniae*.

**Keywords:** Antibacteria, Asiaticoside, *Centella asiatica*, Disc diffusion assay
Effects of Combined Aerobic Dance Exercise and Honey Supplementation on Bone Metabolism in Women

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ABSTRACT: Although combination of physical activity with supplementation has being investigated on its effects in maintaining and enhancing bone health, little is known about the effectiveness of combination of aerobic dance exercise with honey supplementation on bone metabolism markers in women. This study investigates the effects of 8 weeks of combined aerobic dance exercise and honey supplementation on bone metabolism in women. Forty four healthy sedentary women (25-40 year-old) were age and weight matched, and subsequently being assigned into four groups with n=11 per group: Control (C), honey supplementation (H), aerobic dance exercise (Ex) and combined aerobic dance exercise with honey supplementation (HEx) groups. Aerobic dance exercise was carried out for one hour/session, three times/week for eight weeks. Honey drink was consumed by H and HEx groups, in a dosage of 20g of honey diluted in 300ml of plain water, for 7 days/week for 8 weeks. In HEx group, the subjects were required to consume honey drink 30 minutes before performing exercise. Before and after 8 weeks of experimental period, blood samples were taken to determine the concentrations of serum total calcium, bone osteocalcin (bone formation marker) and serum C-terminal telopeptide of type 1 collagen (1CTP) (bone resorption marker). After 8 weeks of experimental period, there was significant greater serum total calcium in post test than pre test in H group. Serum 1CTP concentration was significant greater in post test than pre test in Ex group. The percentage increment in 1CTP was the highest in Ex group, and the percentage increment in this parameter was the lowest in HEx group among all the experimental groups. The results of present study suggest that combination of aerobic dance exercise and honey supplementation may elicit effects on reducing the increment in bone resorption resulting from exercise in sedentary women.

Keywords: Honey, Aerobic dance, Bone metabolism
Hemoglobin E Screening among Aborigines in Kelantan

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ABSTRACT: Hemoglobin E (Hb E) is the one of the most common hemoglobin disorder in many regions, including Asian countries. Currently, in Malaysia, the screening studies on this disorder are conducted on major ethnic groups such as in the Malays, Chinese and Indians. Therefore, data from the aborigine population is still limited. Aim of study was to screen for Hb E among this population. Thus, we presented a cross-sectional study done among 48 aborigines from Pos Brooke, Gua Musang, Kelantan. Hb E were identified using high performance liquid chromatography HPLC. Overall frequency of hemoglobinopathies was 43.8% classified as follows: heterozygous Hb E (39.6 %) and homozygous Hb E (4.2%). In conclusion, it is important to screen for Hb E disorders among aborigines in Kelantan diagnostically because this will guide for their future health planning and management especially in controlling and preventing thalassemia/ hemoglobinopathies.

Key words: Hemoglobinopathies, Thalassemias, Aborigines, HPLC, PCR
Total Aluminium (Al) in Drinking Water from Kampung Orang Asli Kuala Pangsun, Hulu Langat, Selangor Darul Ehsan

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ABSTRACT: Aluminium in the environment is considered harmless and it is assumed that absorption would be limited and thus the metal would not be harmful. However, aluminium compounds have been shown to be toxic to animals and there has been a rising concern over the metal’s potential adverse health effects. The objective of this study was to determine total aluminium levels in drinking water in Kampung Orang Asli Kuala Pangsun, Hulu Langat. A total of 100 water samples were obtained from the study area. The samples were taken from houses that use the water supply for drinking and cooking purposes. Water supply for the village originates from a nearby river and water flows to the houses via gravity feed system (GFS). Total aluminium was determined using Graphite Furnace Atomic Absorption Spectrophotometer (GFAAS). The results demonstrate that a total of 90% of water samples exceeded the National Standard Drinking Water Quality (NSDWQ) Malaysia safe limit for aluminium (0.2mg/L). The mean level for aluminium in water samples was 0.456 ± SD 0.198. Total aluminium levels ranged from 0.0279 - 0.9494 mg/L. Thus, it is necessary for some action to be taken in order to reduce total aluminium levels in drinking water which exceeded the standard. The monitoring on total aluminium levels in drinking water used by residents of Kampung Orang Asli Kuala Pangsun is very important in order to ensure that levels are below 0.2mg/L limit.

Keywords: Aluminium, Drinking Water, Orang Asli, GFS, Hulu Langat
Determination of Normative Value for Gans Sensory Organization Performance Test by Using Aib Balance Performance Foam among Normal Adult

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ABSTRACT: Balance system is one of important body system. Having a good balance system enables us to perform our daily activities such as walking, running and standing without any difficulties. Gans Sensory Organization Performance (SOP) Test is one of the simplest tools to evaluate the body balance. In this test, there are seven conditions that is important in the evaluation of the ability to utilize and integrate sensory input for postural control. The aim of this study is to obtain normative values for Gans SOP test among adults with normal balance function. The measurable variables of this study are starting time of swaying and the degree of swaying from different age, weight and height. Assessment of starting time of swaying and the degree of swaying in condition 1 to condition 6. A total of 42 participants with age range 21 to 52 years old, 20 males and 22 are females were recruited. No relationship between age, weight and height with the results of starting time of swaying and the degree of swaying in condition 1 to condition 6. Besides, there is also no relationship between age, weight and height with the degree of swaying in condition 7. The values for starting time of swaying for condition 1 is (0.00-1.95 seconds), 2 (0.00-2.95 seconds), 3 (0.00-1.95 seconds), 4 (0.00-1.00 second), 5 (0.00-1.95 seconds) and 6 (0.00-0.95 seconds). In condition 7, starting time of swaying cannot be measured due to excessive movement during marching that affected the result. In terms of degree of swaying, the degree of swaying for condition 1 is (0.00º-0.57º), 2 (0.17º-2.56º), 3 (0.00º-1.08º), 4 (0.23º-4.05º), 5 (0.00º-3.37º), 6 (0.41º-7.57º) and 7 (0.98º-18.57º). Evaluation of AIB Balance Performance Foam in condition 5 and 6 did not show any difference between age, weight and height. In conclusion, AIB Balance Performance Foam is one of a good tool since it shows no effect in term of different age, weight and height in starting time of swaying and the degree of swaying when standing on it with eyes open. The results also showed there is no relationship between age, weight and height with starting time of swaying and the degree of swaying when standing on AIB Balance Performance Foam with eyes closed.

Keywords: AIB Balance Performance Foam, Gans Sensory Organization Performance Test
The Study of Factors That Lead to Road Accidents among Students in Health Campus, Universiti Sains Malaysia

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ABSTRACT: The rate of road accidents is increasingly worried. The aim of this research was to study the factors that can lead to road accidents among students in Health Campus Universiti Sains Malaysia. The specific objectives for this study were to determine the relationship between gender, attitude and behavior with road accidents. The study was conducted among 162 students at School of Health Sciences Universiti Sains Malaysia. The instrument used in this research to fulfill the objectives of the study was Questionnaire form. The Questionnaire consists of section A (demographic data), section B (behavior) and section C (attitude). A Chi Square test and Spearman Correlation test were used to answer the objectives of the study. The finding showed that there was no significant relationship between gender (p = 0.217), attitude (p = 0.143) and behavior (p = 0.838) with road accidents. Overall, the factors of accidents among students in Universiti Sains Malaysia does not lead to road accidents.

Keywords: Behavior, Attitude, Road accidents
Indoor Air Quality (IAQ) and Sick Building Syndrome (SBS) among Staffs in Universiti Sains Malaysia Health Campus, Kubang Kerian, Kelantan

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ABSTRACT: A comparative cross sectional study was conducted to determine the association between Indoor Air Quality (IAQ) and Sick Building Syndrome (SBS) in the USM Health Campus. A total ninety office workers were selected where 45 workers were from School of Medical Sciences (Old building) while 45 workers were from new Registration Management Complex Building (New building). A set of questionnaire was adapted from Industry Code of Practice (ICOP) 2010 was used to assess the prevalence of SBS. Meanwhile, IAQ parameters were monitored by using the Handheld 3016 IAQ Particle Counter and Multi Function Ventilation Meter. All IAQ parameters were below the limit standard set by DOSH and USEPA except air velocity in an old building which is lower than the acceptable range standard set by DOSH. The level of IAQ parameter for PM10 and total particulate matter (TPM) in the old building was significantly higher compared to new building (Z= -2.495, p = 0.013) & ( Z = -2.873, p = 0.014). SBS prevalence for the reported cases was 51.1 % for new building while 64.4% for old building, however, the difference was not significant (p > 0.05). Besides, there was a significant difference of drowsiness among respondents between old and new building (Χ²= 4.050, p = 0.044). As a conclusion, the level of all IAQ for both buildings in USM Health Campus was below the limit standard except air velocity in an old building which lower than the acceptable range standard set by DOSH while the prevalence of SBS among staffs was more than 20 %. Therefore, regular maintenance of ventilation and control measures to reduce and prevent IAQ problems have to be implemented to provide a healthier indoor environment for the workers.

Keywords: Indoor air quality, Sick building syndrome
ABSTRACT: Now days, the rate of accident in working at height are increasingly worried. The aim of this research was to study the factors that lead to accident while working at height among construction workers in Kota Bharu, Kelantan. The specific objectives for this study were to identify the relationship between age, working condition and work procedure with accident during working at height. This study was conducted on 90 workers at a construction site. The instrument used in this research to fulfill the objective of the study was Questionnaire form. The questionnaire consists of section A (demographic data), section B (working condition) and section C (work procedure). A Chi Square test, Pearson Correlation test and Spearman Correlation test were used to answer the objectives of the study. The finding showed that there were significant for relationship between work procedures with accident during working at height for use Spearman Correlation test (p = 0.019) and were no significant relationship between age (p = 0.144), working condition (p = 0.117), (p = 0.685) and work procedure (p = 0.097) with accident during working at height. Factors of accidents due to working at height among construction workers in Kota Bharu, Kelantan are not contributor to accidents when working at height unless the work procedure. Therefore, to reduce the accidents from occurring due to working procedure, the initial steps should be taken such as ensure the workers wear personal protective equipment. Besides that, inspection and maintenance of equipment should be seriously to reduce the risk of fall among the workers.

Keywords: accident, working at height, working condition, work procedure
To Study The Safety Audit at Department in Health Campus
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ABSTRACT: The primary purpose of this research was to study the compliance on Occupational Safety, Environment Health, Organization Management, and Occupational Welfare aspect based on OSHA 1994 (act 514), FMA 1967 (act 139), EQA 1974 (act 127), UBBL 1984 and Ministry of Health requirement. The first step of the research was data collection from 42 departments conducted through the safety audit form combining from DOSH, NIOSH, and MOH. Number of 42 from 56 Department in Health Campus USM is done as respondent from Head of Department, Sister and Chief Supervisor. The result of normality test is $p>0.05$. Then there are significant comparisons mean by Occupational Management, Occupational Safety, Environmental Health and Occupational Welfare among 3 Departments that have been categorize. Seconds, comparison means by department among of Occupational Management, Occupational Safety, Environmental Health and Occupational Welfare, Lastly, comparison of mean percentage among 3 categorical departments. The comply sum is as 90.90% from 38 departments and non-complies as 9.09% from 4 departments that are get the low marks in Safety Audit. Conclusion, the result of the study showed that the percentage of compliance is moderate. Therefore the further enforcement on compliance to the act by the legislation authority should be conduct in frame time in order to enhance the great result to identify the hazard of safety and health at work place.

Keywords: safety audit, occupational safety.
Factors of Fatigue which Lead to Probability of an Accident and Perception among Bus Drivers at Konsortium E-Mutiara Berhad

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ABSTRACT: Driver fatigue has long been the topic of discussion and study worldwide. This study aimed to identify the factors which are working schedule, working condition and working environment that contributed to the fatigue among bus drivers in Konsortium E-Mutiara Berhad which lead to probability of an accident. A survey method has been used as an approach. From this study, it was concluded that these three were the factors of fatigue and there was probability of fatigue occurred among bus drivers in Konsortium E-Mutiara Berhad with 62.9% from 97 respondents were experiencing high degree of sleepiness. The result showed that there was significant, positive, medium correlation between fatigue and probability of an accident with Pearson’s $r = 0.324$, $p < 0.05$. This study also identified the relationship between factors of fatigue that lead to probability of an accident and perception of drivers. The result showed that the factors of fatigue which were working schedule and working condition had significant relationship with probability of an accident with Pearson’s $r = -0.288$, $p < 0.05$ and Pearson’s $r = -0.221$, $p < 0.05$ respectively. While, working environment seems had no significant relationship with probability of an accident with Pearson’s $r = 0.190$, $p > 0.05$ but this factor need further study.

Keywords: factors of fatigue, working schedule, working condition, working environment, fatigue, probability of an accident
Validity and Reliability of the Bahasa Melayu Version of the Ureteral Stent Symptoms Questionnaire

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ABSTRACT: The study was designed to determine the validity and reliability of Bahasa Melayu version (USSQ-M) of Ureteral Stent Symptom Questionnaire (USSQ). Patients with ureteric stone and had indwelling ureteric stent for 2 weeks attending the Urology Clinic, Hospital Universiti Sains Malaysia, Kubang Kerian, Kelantan, were recruited. The English version of the USSQ was translated into Bahasa Malayu using a multi-step process by three independent translators and two panel urology experts. The translated Bahasa Melayu version was tested for face and content validity. Validity and reliability testing were further conducted with 10 patients with temporary unilateral ureteric stents to complete the questionnaire at 2 weeks after stent insertion followed by a retesting session 4 weeks later. The reliability of the USSQ Bahasa Melayu version addresses various domains of health (6 sections and 38 items) affected by stents covering urinary symptoms, pain, general health, work performance, sexual matters and additional problems was evaluated for internal consistency using Cronbach’s $\alpha$ test. The validation studies showed the questionnaire to be internally consistent (Cronbach’s $\alpha >0.7$) with good test-retest reliability (Pearson’s coefficient $>0.8$). It can be concluded that the USSQ-M questionnaire is comparable with the original English version in terms of validity and reliability; and may be used for the assessment of a psychometrically valid measure to evaluate symptoms and impact on quality of life among patients with ureteral stents.

Keywords: Ureteric Stent Symptom Questionnaire (USSQ), Validation, Reliability, Construct Validity, Malaysia
A new innovation to overcome the problem of the unavailability of herbal essential oils for the practical classes on Pharmacology

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ABSTRACT: This innovation was developed to overcome the unavailability of herbal essential oils for practical classes on Pharmacology at the School of Health Sciences, Universiti Sains Malaysia, Kelantan. Attempts to obtain essential oils from the market were unsuccessful because most essential oil manufacturers only produce those of high commercial values. The essential oils derived from herbs required for our purpose may be available but they were in the formulation and therefore are no longer chemically pure. This makes our practical classes difficult especially when the classes are conducted in small groups in every semester. Among the suggestions to overcome this problem is to purchase an essential oil distiller. However, this proposal is still under the consideration of laboratory management given that only small quantities of essential oil is needed per practical class while most commercially available distillers are big and costly. Our survey shows that a laboratory-scale distiller is available on the market, but the amount of essential oils produced per cycle was too little and far from enough for our purpose. Hence, I-Amin group took the initiative and designed a laboratory-scale hydro distiller in an appropriate size named as 'PEMINHERB System'. The above distillation system is small, portable and does not require a large bench space. In addition, the system can minimize the use of labour as it does not use a pressure generator as normally found in commercial distillers. It is easy to assemble and very user friendly; therefore, the cost for technical training is not required. Huge saving is achieved because the development cost for the distiller is minimal. In conclusion, this system has overcome our problems in the School of Health Sciences. More importantly, it can also be used by other laboratories or schools.

Keywords: herbal, essentials oils