



16TH STUDENTS SCIENTIFIC CONFERENCE

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Abstracts

16th Students Scientific Conference (16th SSC)

Kota Bharu, Kelantan, Malaysia. 21st February 2019

Oral Presentation – Basic Sciences

(BS 1) Development of honey-PLGA microparticles for periodontal therapy: A pilot study

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Introduction: Honey is useful for the treatment of many oral diseases, including periodontal problem. However honey possess problem to be used in periodontal area as it is easily wash away by the gingiva crevicular fluid. Therefore a good carrier that can slow release honey is needed to ensure the optimum usage of honey as adjunct in periodontal treatment. Incorporating honey into synthetic drug carrier, PLGA might improve the efficacy of local delivery of honey into periodontal defect.

Objectives: To develop and characterize poly (lactic-co-glycolic acid) (PLGA) microparticle drug carrier containing Akasia honey. **Methods:** Akasia honey-PLGA microparticles were formulated using the diffusion-solvent-evaporation method. The characterization was carried out by evaluating the physical properties, microparticles morphology and *in vitro* release profiles. PLGA-microparticles without honey were used as control. **Results:** It was found that Akasia honey-PLGA microparticles having a quite soft texture in compare to control during manipulation. From SEM, it was observed that the honey microparticles are about 2.0-25.0 µm in size. *In vitro* release profile showed slow release of honey over 6-time intervals. **Conclusion:** These formulations showed an appropriate particle size ranging from 2 to 25 µm. This range is conform to the normal microparticle size. The honey microparticle have potential to be used as sustained released drug delivery agent in treating periodontal defect.

(BS 2) Screening of *Alocasia denudata* Engler for antimicrobial effect against selected oral pathogen and its phytochemical compound

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Introduction: *Alocasia denudata* Engler is a herbal plant used by traditional healers as a wound healing agent and its potential has been proven scientifically. Wounded tissue offers opportunity for microflora to adhere, colonize, invade and infect surrounding healthy tissue.

Objectives: To study antimicrobial effect of *Alocasia denudata* Engler on selective oral pathogen as well as to analyse its phytochemical compound. **Methods:** The stem of *Alocasia denudata* was extracted with 80% ethanol solution and freeze dried. The extraction yield was calculated and recorded. The extract with different concentrations; 16 mg/ml, 8 mg/ml, 4 mg/ml, and 2 mg/ml were tested using agar well diffusion method for antimicrobial sensitivity. The selected oral bacteria were *Streptococcus mutans*, *Staphylococcus aureus*, *Enterococcus faecalis*, and non-oral pathogen *Streptococcus pyogenes*. These bacteria were incubated for 24 hours except for *Streptococcus mutans* for 48 hours. Inhibition zone was recorded. The freeze-dried extract was send to Poison Centre for its phytochemical constituents. **Results:** Our results showed that the mean yield of extraction was 12.8% and different concentration of *Alocasia denudata* shows no antimicrobial effects towards selected oral pathogen including non-oral pathogen bacteria. It is supported by Gas chromatography mass spectrometry (GCMS) results where it showed that antimicrobial compound is absent whereas anti-inflammatory and anti-oxidant compound presents in *Alocasia denudata* ethanolic extract. **Conclusion:** The *Alocasia denudata* extract has no antimicrobial compound on selected oral pathogen.

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(BS 3) Evaluation of rheology and bonding of new modified GIC-nanozirconia-silica-hydroxyapatite hybrid material

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Introduction: The weaknesses of conventional glass ionomer cement (cGIC) in mechanical and physical properties have resulted in many attempts to improve it. At School of Dental Sciences USM, a new modified hybrid material, GIC-nanozirconia-silica-hydroxyapatite (GIC-nanoZr-Si-HA) has been synthesized which showed an improvement in the properties.

Objectives: To determine the powder/liquid (P/L) ratio of the GIC-nanoZr-Si-HA that has nearest consistency (rheology) as cGIC (Fuji IX) and to evaluate bonding to tooth structure through ion-exchange. **Methods:** For rheology, 7 samples per group were prepared for 3 groups of GIC-nanoZr-Si-HA with different P/L ratio (2 scoops/1 drop, 2 scoops/2 drops and 2 scoops/3 drops) and 1 group of cGIC (2 scoops/2 drops). The materials were pressed under a load of 120g between glass plates and left for set. The diameters were assessed descriptively and six lines were measured with calliper and analysed using one-way ANOVA test. For bonding through ion-exchange, a cavity with diameter 5x2mm were prepared on buccal surface of 2 mandibular molars before each was restored with GIC-nanoZr-Si-HA and cGIC. After 3 months, the samples were sectioned in middle and examined under SEM/EDX. **Results:** All P/L ratios for GIC-nanoZr-Si-HA showed significantly different from cGIC ($p < 0.05$) but the ratio of 2 scoops/2 drops was the best descriptively. The new hybrid material showed greater ion-exchange noted in enamel when compared to cGIC. **Conclusion:** The P/L ratio of 2:2 which is the same as cGIC is suitable for new hybrid material. The hybrid material possessed good bonding with enamel in term of ion-exchange.

(BS 4) Optimisation of alginate-agarose hydrogel beads components for encapsulation of dental stem cells

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Introduction: Hydrogel has been used in various biological technologies due to its unique characteristics, including stem cell encapsulation. Alginate is the most studied natural polymer for its biocompatibility and ease of handling, whereas agarose is known for its wide availability and medical uses. Fine tuning of hydrogel components is essential for stem cell encapsulation as it will improve the mechanical characteristic of the final hydrogel construct. Both alginate and agarose are of great interest in this study for their non-cytotoxic nature.

Objectives: This study aims to optimise the composition of agarose-alginate hydrogel beads for potential use in stem cell transportation.

Methods: Different concentrations of agarose, alginate and CaCl_2 were tested to construct the hydrogel beads. The degradation rate and swelling ratio of each hydrogel samples were recorded. Optimum concentration of agarose-alginate hydrogel was selected for encapsulation of stem cells from human exfoliated deciduous teeth (SHED). The results were statistically analysed by SPSS 23.0.

Results: The highest degradation rate was recorded by a combination of 1.0% alginate, 1.0% agarose, and 0.3mol CaCl_2 . Meanwhile, 1.0% alginate and 1-2% agarose was also found to increase the hydrogel swelling ratio. The selected concentration of hydrogels components was successfully utilised to encapsulate SHED which remains viable until day 7. **Conclusion:** The present study demonstrated that each of agarose, alginate and CaCl_2 concentrations correlate with the degradation rate and swelling ratio of hydrogel beads. Further analysis is needed to characterise the hydrogels mechanical properties, along with the functional application to confirm on their potential use in stem cells delivery.

(BS 5) Effect of silver diamine fluoride on enamel colour in caries process: An *in vitro* study

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Introduction: Silver diamine fluoride (SDF) is a topical fluoride that is used for caries arrestment and to desensitize teeth. However, the effect produced by SDF is a major concern. Black staining produced may affect the aesthetic appearance of an individual. This is to ensure that the uses of SDF will be widely used without concerning the staining effect that will happen, considering to its good antibacterial and desensitization values that may beneficial to all.

Objectives: The purpose of this *in vitro* study was to determine whether potassium iodide (KI) helps to prevent SDF staining. **Methods:** A total number of 30 extracted premolar teeth were divided equally into three groups. Colour measurement was recorded using Vita Easyshade Advanced 4.0 (VITA Zahnfabrik GmbH, Bad Säckingen, Germany) at different time (baseline, demineralization and remineralization) to evaluate the colour changes. ΔL , Δa , Δb value bar graph was plotted and ΔE value was calculated. **Results:** There were significant differences among all groups ($p < 0.05$) when recorded at different time. SDF groups recorded the highest colour changes compared to other groups. Teeth treated with KI showed minimal staining and ΔL were lighter compared to SDF group. **Conclusion:** SDF and KI treatment helps to reduce the staining effect done by SDF treatment alone.

(BS 6) Compressive strength and setting time on type III recycled gypsum through pressure heat method

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Introduction: Gypsum is commonly used to make study models and work models in process of making dentures. The making of work models generally uses gypsum type III which has the compressive strength of 20.7 MPa and setting time of 12 ± 4 minutes. The models that has been used will become waste and must be discarded. If left unchecked and continues, then the substances contained in the gypsum will cause environmental pollution problems, because it cannot be easily broken down by the soil. Gypsum is unrenovable natural resource so it will run out if there is no effort to recycle the gypsum that has been used. **Objectives:** This study aims to find out the value of compressive strength and setting time by recycling type III gypsum waste use pressure heat method. **Methods:** The study began with collecting type III gypsum waste and making the recycled gypsum powder. The recycled gypsum powder, then printed into a mold size of 20 mm x 40 mm high PVC pipe for compressive strength and PVC pipe size of 25 mm x 25 mm high for setting time measurements. The compressive strength was measured using Universal Testing Machine while the setting time measurement used Vicat test device. **Results:** Our results showed that in average compressive strength of type III recycled gypsum was 0.01 MPa and the setting time was 45.8 minutes. **Conclusion:** The compressive strength of type III recycled gypsum by pressure heat method was 0.01 MPa and the setting time value was 45.8 minutes.

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(BS 7) Cell proliferation assessment of human gingival fibroblasts treated with *Clinacanthus nutans* using alamarBlue assay

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Introduction: *Clinacanthus nutans* (*C. nutans*) is a herbal plant consumed and used by Southeast Asian communities for its medicinal uses. *C. nutans* has been shown to have anti-inflammatory, antipyretic, antiedemic and analgesic properties and used traditionally in treating various skin ailments, *Herpes* infection, cancer and diabetes. In Malaysia, the young leaves of this plant are consumed to maintain health. **Objectives:** This study aimed to assess the proliferative activity of human gingival fibroblast cells (HGF-1, ATCC®CRL-2014™, USA) treated with different concentrations of ethanolic extract of *C. nutans* leaves. **Methods:** HGF-1 cells were cultured in a 6-well plate and treated with 3 different concentrations (250, 125 and 62.5 µg/ml) of ethanolic leaf extracts of *C. nutans* and incubated in a CO₂ incubator at 37°C with 5% CO₂ for 1, 2, 3, 4, 5, 6, and 7 days. Cell proliferation was assessed using alamarBlue® assay and reduction in alamarBlue® was calculated. The data were analyzed using Kruskal-Wallis test to compare the proliferative activity of HGF-1 cells treated with ethanolic leaf extracts of *C. nutans* and control (untreated cells). **Results:** The proliferative activity of HGF-1 using alamarBlue® assay showed that the cells treated with 62.5 µg/ml of ethanolic extract of *C. nutans* leaves exhibited increased proliferation compared to the other groups. **Conclusion:** Ethanolic extract of *C. nutans* leaves increases the cell proliferation and does not exhibit any cytotoxicity on human gingival fibroblast cells.

(BS 8) Cytotoxicity effect of aqueous areca nut extract on mouse fibroblast cell line

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Introduction: Betel quid chewing habit is still widely practised in many Asian countries. Areca nut, a known carcinogen, is one of the main constituents of betel quid. The incidence of oral cancer increases significantly with areca nut consumption. **Objectives:** The objective of this study was to assess the cytotoxicity effect of areca nut aqueous extract on mouse fibroblast cell line (L929). **Methods:** Dried areca nut chips obtained from Siti Khadijah Market were prepared and suspended in DMEM (Dulbecco's Modified Eagle's medium), followed by dilution into different concentrations (1.56, 0.781, 0.39, 0.195, 0.0976, 0.0488, and 0.0244 mg/ml). L929 was treated with each of the aqueous areca nut extract dilutions, followed by incubation at 37°C for 24, 48 and 72 hours. The viability of treated L929 was measured using MTT [3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium] assay. **Results:** Following treatment with aqueous areca nut extract at different concentrations, cell viability of L929 was significantly decreased with increased areca nut extract concentrations (1.56, 0.781, 0.39, 0.195, 0.0976 mg/ml) for all incubation times compared to the control (untreated) ($p < 0.05$). The IC₅₀ value of areca nut extract on L929 were 0.195, 0.135, and 0.112 mg/ml at 24, 48 and 72 hours, respectively. **Conclusion:** The study indicates that areca nut aqueous extract is cytotoxic to L929 at higher concentrations. Further study on its role in the disruption of cell proliferation might provide an insight of its association with oral carcinogenesis.

(BS 9) Flexural strength, viscosity and SEM/EDS analyses of experimental zirconia reinforced nanohybrid dental composite from rice husk

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Introduction: School of Dental Sciences, USM is developing a zirconia reinforced nanohybrid dental composite using silica purified from rice husk as filler. **Objectives:** This study aimed to analyse the effects of zirconia reinforcement on the dental composite flexural strength (FS), viscosity and microstructure using Scanning Electron microscopy (SEM) coupled to Energy Dispersive X-ray spectrometry (EDS). **Methods:** Ten bar-shaped specimens (24 mm x 2 mm x 2 mm) were prepared for each group. There were seven groups with different percentage of zirconia reinforcement, and different mixing method: Negative control (0 wt %), Mixing IA (3 wt %), Mixing IB (5 wt %), Mixing IIA (3 wt %), Mixing IIB (5 wt %), Mixing III (5 wt %) and Positive control (Filtek Z250; 3M ESPE). The FS was tested using a universal testing machine. One sample from each group, with the FS value close to the mean was selected for viscosity, SEM and EDS analysis. One-way ANOVA and post-hoc Tukey's test were used for analysis. **Results:** FS values were found significantly increased with the proportion increment of zirconia reinforcement ($p < 0.001$). However, there were no significant differences of FS values when three different zirconia mixing methods were compared. A higher viscosity was noted for composite with zirconia. SEM/EDS analysis showed homogenous distribution of fillers such as zirconia and silica into organic matrix. **Conclusion:** The data suggests that zirconia reinforcements (3 wt % and 5 wt %) increase the flexural strength and viscosity of this experimental nanohybrid dental composite.

(BS 10) Efficacy of propolis-based toothpaste towards the healing of thermal traumatic ulcer in the buccal mucosa of *Mus musculus* (Swiss Webster)

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Introduction: Ulcer is a problem which is mainly found in the oral cavity. The pain resulted often causes discomfort towards the patients hence affecting their life quality. The application of propolis-based toothpaste to ulcers has an anti-inflammatory function which promotes and accelerates wound healing. **Objectives:** To examine the efficacy of propolis-based toothpaste to treat thermal traumatic ulcer in the buccal mucosa of *Mus musculus* (Swiss Webster). **Methods:** The research is an experimental laboratory study featuring *in vivo* analysis by involving 18 male *Mus musculus* (Swiss Webster) with thermal traumatic ulcer in the buccal mucosa which exposed by an 80°C ball-pointed instrument for 5 seconds. The samples were divided into three groups: saline NaCl 0.9% (negative control group), non-propolis toothpaste (positive control group) and propolis-based toothpaste containing 5% propolis extract as treatment group. Ulcers were observed on day 1, 3, 5 and 8 by means of clinically (ulcer diameter, swelling and redness around ulcer, weight, ulcer healing percentage) and histopathologically (inflammation score). **Results:** All groups revealed the peak formation of ulcers on day 3. In clinical observation, the propolis-based toothpaste group showed greater healing percentage in day 5 and 8. Histopathological observation also showed a decrease of inflammation score on day 8. **Conclusion:** Propolis-based toothpaste is effective towards the healing of thermal traumatic ulcer in the buccal mucosa of *Mus musculus* (Swiss Webster).

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(BS 11) Chemical compound of *Beta vulgaris* (beetroot) and its antimicrobial activity against oral pathogen

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Introduction: Beetroot, is scientifically known as *Beta vulgaris*. In Malaysia, it is called as 'Ubi Bit'. The traditional use of beetroot as a medicinal herb for curing infectious diseases and the studies associating beetroot extracts with antioxidant and antimicrobial activity provide a basis for exploring its antimicrobial potential. In general, beetroot extracts have exhibited antimicrobial activity against a wide range of Gram-positive bacteria and Gram-negative bacteria. **Objectives:** This study was conducted to identify the chemical compounds of *Beta vulgaris* and to evaluate its antimicrobial activity against oral pathogen. **Methods:** The ethanolic extract of *Beta vulgaris* was derivatized and analyzed by gas chromatography-mass spectrometry (GCMS). The compounds were later identified by library searching and mass spectral databases. As for the antimicrobial activity, agar well diffusion assay in a triplicate method with different concentrations of ethanolic extract of *Beta vulgaris*: (125,250,500 and 1000ug/ml), was carried out for the oral pathogens; *Streptococcus mutans*, *Enterococcus faecalis* and *Streptococcus aureus*. **Results:** Thirty-three compounds were identified from *Beta vulgaris*. The main class group compounds were glucose, amino acid and carboxylic acid. As for the agar well diffusion assay, there is no inhibition zone noted for all the concentrations of ethanolic extract of *Beta vulgaris*. **Conclusion:** Sucrose and l-Glutamine, tris(trimethylsilyl) derivative were the main glucose and amino acid that were identified respectively in *Beta vulgaris*. *Beta vulgaris* has no antimicrobial activity against oral pathogens stated above.

(BS 12) The effect of incorporation of cellulose kenaf fiber in composite resin on mechanical properties

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Introduction: Fibre reinforced composite is characterized by high, specific strength and improved stiffness. Currently, natural-based fibre product such as kenaf is widely used for various applications. **Objectives:** To evaluate the mechanical properties of composite resin after incorporation of cellulose kenaf fibres. **Methods:** 2% kenaf fibres were manually incorporated into composite resin [Tetric (Ivoclar Vivadent, Liechtenstein)] after alkaline treatment and wetted with coupling agent. Ten specimens for each experimental and control group, Tetric (Ivoclar Vivadent, Liechtenstein) were prepared using stainless steel mould with a dimension of 6mm x 4mm and 25mm x 2mm x 2mm for compressive and flexural strength test respectively and later tested using Instron Universal Testing Machine (Shimadzu, Japan). Raw kenaf fibre, treated kenaf fibre and fractured sample from flexural strength were analyzed using Scanning Electron Microscopy (SEM) (FEI Quanta FEG 450, USA) for their surface topography. Data were analyzed using independent T-test and Mann-Whitney U test. $p < 0.05$ was considered as significant. **Results:** Experimental group has a significantly lower flexural, compressive strength and compressive modulus but higher elastic modulus of flexural strength than control group. SEM analysis revealed that the fibres have average length of 1.24 mm with diameter ranging from 6.56 μ m to 12.9 μ m. Fibres dispersed in composite mainly as a single strand and few bundles with a minimal gap between fibres and composite. **Conclusion:** Improved adaptation between kenaf fibres and composite noted after alkaline treatment and coupling agent wetting, however flexural and compressive strength did not increase. Therefore, additional treatments of kenaf are required for favourable result.

(BS 13) *In vitro* antimicrobial efficacy of alternative root canal irrigants from local plant extract (CIERA®)

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Introduction: *E. faecalis* and *C. albicans* is the most highly prevalent in endodontic retreatment case. The complete eradication of these microorganism is a challenge in retreatment case. Sodium hypochlorite has been used as gold standard root canal irrigants in endodontic treatment despite its toxic effect on the soft tissue. CIERA® is a household disinfectant which is an extract from aloe vera and green tea. **Objectives:** To compare the antimicrobial efficacy of CIERA® and sodium hypochlorite against *E. faecalis* and *C. albicans*. **Methods:** The sodium hypochlorite and CIERA® were prepared in same concentration which is 12.5%, 25%, 50% and 100% from its original concentration. The positive control is the 0.5% Chlorhexidine and negative control was distilled water. The antimicrobial activity of the sodium hypochlorite and CIERA® against *E. faecalis* and *C. albicans* were studied using disc diffusion method. After 24 hours, the zone of inhibition were measured. The determination of the MIC and MBC for sodium hypochlorite and CIERA® against *E. faecalis* and *C. albicans* were determined using macrodilution method. **Results:** There is no significant difference of antimicrobial efficacy of CIERA® and sodium hypochlorite against *E. faecalis*. However, there is significant difference of antimicrobial efficacy of sodium hypochlorite and CIERA® against *C. albicans*. **Conclusion:** CIERA® exhibit almost similar antimicrobial efficacy as sodium hypochlorite against *E. faecalis*. Furthermore, the antimicrobial efficacy of CIERA® and sodium hypochlorite against *C. albicans* are effective in higher concentration.

(BS 14) Potential of distilled liquid smoke derived from coconut shell (*Cocos nucifera* L) for traumatic ulcer healing in diabetic rat

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Introduction: Distilled liquid smoke derived from coconut shell of (*Cocos nucifera* L) was examined to investigate its potential for traumatic ulcer healing in the diabetic rat. The major component is phenolic compounds which a strong antioxidant that capable to inhibit production of Tumor Necrosis- α (TNF α), inhibit the activation of Nuclear factor kappa B (NF κ B), and also accelerate the contraction and increase the number of fibroblasts in skin burn wound healing. **Objectives:** To prove distilled liquid smoke derived from coconut shell has potential for traumatic ulcer healing in diabetic rat. **Methods:** This study used method post-test only-control group design. Distilled liquid smoke derived from coconut shell using pyrolysis and distillation process. Fifty-four Wistar rats induced with alloxan monohydrate to stimulate diabetic condition. Rats were divided into test group given sterile aquadest, benzydamine hydrochloride (BHCl), and distilled liquid smoke. On day 3, 5, and 7, NF κ B and TNF α expression evaluated with immunohistochemical staining, and number of collagen with Masson Trichome staining on traumatic ulcer area. The data was analysed by One Way ANOVA. The Post-Hoc procedure was used for the significance of difference ($p < 0.05$). **Results:** The lowest NF κ B and TNF α expressions were observed with topical application of distilled liquid smoke derived from coconut shell for 3, 5, and 7 days treatment. The number of collagen was increased and showed the highest impact of distilled liquid smoke compare to other. **Conclusion:** The distilled liquid smoke derived from coconut shell able to perform promotion of traumatic ulcer healing.

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Oral Presentations – Clinical Sciences

(CS 1) Effect of bedtime on recurrent aphthous stomatitis among dental students

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Introduction: Recurrent aphthous stomatitis (RAS) is one of the most common oral mucosal conditions seen among patients. Although the pathogenesis of RAS is poorly understood, a number of predisposing factors have been identified. Recently, late bedtime was reportedly associated with increased severity of RAS among college students. **Objectives:** This study aims to examine the effect of bedtime and other risk factors on RAS among dental students in Universiti Sains Malaysia. **Methods:** A structured, self-administered questionnaire which included variables on demographic data, risk factors and clinical presentation of RAS was given to 248 respondents. Statistical analyses were used to explore the relationship between bedtime and other risk factors with RAS. **Results:** A total of 219 subjects responded to the questionnaire. The prevalence of RAS among dental students was 30.1%. Late bedtime after 11 p.m. was not significantly associated with occurrence and severity of RAS ($p > 0.05$). Family history (odds ratio [OR] 5.84; 95% confidence interval [CI] 1.73-19.73; $p < 0.001$) was the only independent risk factor for RAS occurrence. **Conclusion:** Bedtime after 11 p.m. was not significantly related to the severity of ulcers among the dental students.

(CS 2) Sexual dimorphism of human skull based on analysis of craniometric measurements, orbital bone and eyeball volume using CT images

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Introduction: Morphometric analysis of skull can be used in determination of sex in Forensic Medicine and Dentistry. Besides, eye may be lost in ocular disease, developmental abnormalities or even trauma. By knowing the eyeball volume, we can manage the treatment plan and the size of the ocular prosthesis can be determined. **Objectives:** This study aims to determine the sexual dimorphism of skull by morphometric analysis of anthropometric data, to evaluate and compare the periorbital bone between genders, and to analyze the eyeball volume. **Methods:** Fifty CT scans data were included in this study. 11 landmarks were located on the skull and 10 cranial measurements were obtained between 2 landmarks. Besides, the point of reference on periorbital bone is coincided with the hours of a clock and the distance between 12h-6h, 9h-3h, 1h-7h and 11h-5h were measured. For eyeball volume measurement, the calculations were performed in axial plane and the border of eyeball was outlined and segmented. The volume was calculated after segmentations were done from different axial slices. **Results:** The bizygomatic breadth, biorbital breadth, nasal height, upper facial height, maximum cranial length, occipital chord and frontal chord showed significant difference between genders ($p < 0.05$). The periorbital bone distance at 1h-7h on right and 11h-5h on left showed significant difference between genders ($p < 0.05$). The eyeball volume in men was larger than women but the difference was not significant ($p > 0.05$). **Conclusion:** Most of the craniometric measurements analyzed were sexually dimorphic and it is reliable for sex determination in human identification.

(CS 3) Periodontal health in pre-dialysis chronic kidney disease (CKD) patients in Hospital USM

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Introduction: Limited studies have been reported locally on the prevalence of periodontal disease among chronic kidney disease (CKD) patients in our population. **Objectives:** To assess the periodontal status and periodontal parameters of pre-dialysis CKD patients in Hospital USM. **Methods:** A total 46 pre-dialysis CKD patients (stage III and IV) who attended nephrology clinic Hospital USM were enrolled. Clinical periodontal examination was performed using periodontal probing depth (PPD), clinical attachment loss (CAL) and plaque score (O'Leary). Estimated glomerular filtration rate (eGFR) of the CKD patients were calculated by using MDRD CKD-EPI equation. **Results:** Majority CKD patients were Malay (95.7%), male (80.4%) with mean age of 58.5±12.8. Thirty-seven (74.0%) of the patients had mild periodontitis, 9 (20.0%) moderate periodontitis and 3 (6.0%) no periodontitis, using PPD measurement. Contrarily, based on CAL parameter, 12 (26%) patients had mild periodontitis, 29 (63.0%) moderate periodontitis and 5 (11%) had severe periodontitis. The mean value of mild and moderate-to-severe periodontitis by PPD were 4.26±0.26 and 5.24±0.36 respectively, while mean of mild and moderate-to-severe periodontitis by CAL were 2.66±0.62 and 4.98±0.73 respectively. There was no correlation of each periodontal parameters (PPD, CAL and plaque score) with eGFR of the CKD patients. **Conclusion:** This study demonstrated a greater prevalence and severity of chronic periodontitis among CKD patients. Thus, the periodontal health of CKD patients needs to be screened and monitored. Future studies with multicentered and larger sample size are warranted to explore the magnitude of this problem.

(CS 4) Analysis of root position and angulation of maxillary anteriors within the alveolar bone and buccal alveolar bone thickness in Malaysian population using cone beam computed tomography (CBCT)

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Introduction: Implant placement in aesthetic zone requires detailed information of the socket such as the root position and angulation as well as the buccal alveolar bone thickness of maxillary anteriors. **Objectives:** To determine the root position and angulation of maxillary incisors within the alveolar bone and buccal alveolar bone thickness in Malaysians using cone beam computed tomography (CBCT). **Methods:** Forty-six CBCT images of subjects aged 18 – 40 years were obtained using Planmecca Promax 3D unit (Planmecca Oy, Finland) using standardised protocols (80/90kV, 10mA and 12s) with voxel size 0.3mm and F.O.V 8×8×8. Measurements were performed using Planmecca Romexis 2.9.2 software (Planmecca Oy, Finland). X² test and ANOVA were used for analyses. **Results:** Significant prevalence of buccal Type 1 root position for central incisors and buccal Type 2 for lateral incisors and canine were found. All maxillary anteriors were labially angulated with no significant difference in the degree of angulation. Thickness of buccal alveolar bone varies at different locations of measurement with tendency to be thicker at the apex and 2mm apical to the apex of tooth. No significant correlation was found between the root position and buccal alveolar bone thickness and between angulation and buccal alveolar bone thickness. **Conclusions:** Maxillary incisor roots were labially angulated and positioned close to the buccal alveolar bone wall. Data obtained from this study offers information which is crucial in selecting appropriate dental implant treatment plan and determining the implant placement.

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(CS 5) Awareness of periodontal-diabetes mellitus interrelationship and self-reported periodontal status among diabetic patients attending Hospital USM

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Introduction: Patients' awareness about the bidirectional relationship between periodontitis and Diabetes mellitus (DM) is not well known. **Objectives:** To evaluate the prevalence of awareness of periodontal-diabetics interrelationship and factors associated with the awareness in DM patients. **Methods:** A total of 123 DM patients with mean age 62.2 (SD= 9.55) years participated in this cross-sectional study. Participants were asked to respond to questionnaires on socio-demographic status, self-reported periodontal health status, and awareness about periodontal-DM relationship using validated questionnaire. The level of HbA1c was recorded from medical record. **Results:** The mean duration of having diabetes was 10.62 (SD=6.52) years and the mean HbA1c level was 9.08 (SD=2.24) mmol/l. Only 15% of patients were aware about the periodontal-DM relationship; of which 38% agreed that DM may affect gum health. However, 52.8% reported having signs of periodontal disease. Self-reported gum bleeding was significantly associated with the awareness of periodontal-DM interrelationship ($p=0.015$). **Conclusion:** The prevalence of awareness of periodontal-DM interrelationship was low in DM patients and having gum bleeding was associated with lack of awareness. Awareness about the relationship should be increased in DM patients to lower the impact on periodontal health and improve oral health related quality of life.

(CS 6) Influence of different access cavity designs on the fracture resistance of endodontically treated teeth

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Introduction: Conservative endodontic cavity (CEC) is developed from the concept of minimally invasive dentistry to provide an alternative to traditional endodontic access cavity (TEC). It has been designed to preserve the mechanical stability of teeth. Recently, truss endodontic cavity (TREC) has been introduced by clinicians to further improve the strength of endodontically treated tooth. **Objectives:** To determine the effect of endodontic access cavity design on the fracture strength of endodontically treated teeth. **Methods:** Eighty intact human first mandibular molars were randomly assigned to four groups (n=20), control (intact teeth), TEC, CEC and TREC. Teeth in the TEC group were prepared following the principles of TEC. Minimally invasive and orifice directed endodontic access were prepared in CEC and TREC group respectively. All access cavities were then restored with composite and teeth in all groups were loaded until fracture using a mechanical testing machine. The maximum load at fracture and fracture patterns (restorable or unrestorable) were recorded. Fracture loads were compared statistically using ANOVA, and Chi-Square test used for multiple comparisons. **Results:** The mean load at fracture for TEC was significantly lower than CEC, TREC and control groups ($P<0.05$). No significant difference was observed between CEC, TREC and control groups ($P>0.05$). Unrestorable fractures were significantly more frequent in all three endodontic access groups ($p<0.05$). **Conclusion:** Teeth with TEC showed lower fracture strength than teeth with CEC or TREC. TREC did not increase the fracture strength of teeth as compared to CEC. Intact teeth showed more restorable fractures than all prepared ones.

(CS 7) Occurrence of periodontitis and associated factors among young adults attending Hospital Universiti Sains Malaysia (HUSM) dental clinic

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Introduction: Periodontal disease is one of the two major dental diseases which have high prevalence rates worldwide, the other being caries. Periodontal disease can be mainly classified into two types, namely gingivitis and periodontitis. When the inflammation involves the loss of tooth supporting periodontium, it is termed periodontitis. At present, there is high prevalence of periodontal condition involving the adults which needs attention to arrest the progression of disease, preserving the dentition in the state of health and to prevent recurrence of periodontitis. **Objectives:** The present study was conducted to assess the occurrence of periodontitis and associated factors among young adults attending HUSM Dental Clinic. **Methods:** This study involves the retrieval of secondary data from the patient's dental record from HUSM. The Basic Periodontal Examination (BPE) score of the patients during dental visit was recorded. Patients' personal data including sociodemographic data (age, sex, ethnicity, education level and working status), smoking status and systemic disease were retrieved to find out the association with periodontitis. **Results:** Our results showed that the prevalence of periodontitis among young adults is 17.2% and with the minimum age of 21 and mean age of 28.53. Age and periodontitis has a correlation value of 0.206. There is also association between smoking and periodontitis. **Conclusion:** The prevalence of periodontitis among young adults is 17.2% and it is associated with smoking and weakly associated with age.

(CS 8) Oral squamous cell carcinoma as a complication of hematopoietic stem cell transplantation: A review of the literature & a case report

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Introduction: Hematopoietic stem cell transplantation (HSCT) has improved the survival rate of patients with different malignancies and other haematopoiesis disorders. However, late complications such as oral squamous carcinoma (OSCC) have been described. Complicating the diagnosis of an OSCC in this population is the confusing appearance of Graft-Versus-Host Disease (GVHD). **Objectives:** To increase the awareness on OSCC as a complication of HSCT and its management among dental and medical health professionals. **Methods:** This research was carried out based on retrospective study of reported cases of OSCC post-allogeneic HSCT worldwide and patient's folder diagnosed with OSCC post-allogeneic HSCT in Hospital Universiti Sains Malaysia. **Results:** We reported one case herein. Based on literature review, male predilection with age less than 20 years old are more likely to develop OSCC post-allogeneic HSCT. Prolonged immunosuppressive therapy, prednisolone and methotrexate used are also significant risk factors for OSCC. The incidence of developing OSCC is more than 1 year post-allogeneic HSCT. The most frequent initial clinical presentation of OSCC is a white or red/white plaque or exophytic growth, with the tongue being the oral site most often affected. The first choice of treatment is surgical excision of the tumour that can be combined with radiotherapy, especially when the tumour margins are compromised. **Conclusion:** Periodic conventional oral examination (COE) is highly warranted in these patients for early detection of oral squamous cell carcinoma.

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(CS 9) Volumetric cone beam computed tomography (CBCT) analysis of the palatine process of maxilla in non-torus and torus palatinus subjects: A potential source for bone grafts

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Introduction: Autogenous bone graft is the gold standard in oral and maxillofacial reconstructive surgery. Palatine process of maxilla (PPM) is a potential alternative source of bone grafts with minimal morbidity and time consumption especially in treating maxillary alveolar defects. **Objectives:** To compare the PPM volume between non-torus and torus palatinus subjects and between males and females using CBCT. **Methods:** Seventy-three (47 non-torus, 26 torus palatinus) CBCT images of subjects aged 20 years and above were obtained using Planmeca Promax 3D unit (Planmeca Oy, Finland) using standardised protocols (80/90kV, 10mA and 12s) with voxel size 0.3mm and F.O.V 8×8×8. Measurements were performed using Medical Imaging Interaction Toolkit software (open-source, Germany). Region of interest was defined in a sagittal view from posterior part of incisive canal to the transverse palatine suture. Segmentation of the region of interest was performed for every three slices until maxillary sinus was seen. Interpolation of the segmented region was used to calculate and create 3D volume of the PPM. Independent t-test was used for analysis. **Results:** Generally, the PPM volume of torus palatinus subjects was significantly larger than the non-torus. Larger PPM volume was observed in males with torus palatinus compared to non-torus males. In torus palatinus group, males have larger PPM volume than females. **Conclusion:** PPM has acceptable volume to be considered as potential source for bone grafts particularly for maxillary alveolar reconstruction. Torus palatinus while exists as harmless bony protrusion of the hard palate, has the added benefit as a valuable site for bone grafting.

(CS 10) The retrospective study on the position of mandibular lingula on cone beam computed tomography (CBCT) among Malaysian adult population

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Introduction: The precise anatomic location of the mandibular lingula is clinically significant because it is being used as surgical landmark in various oral and maxillofacial surgical procedures. **Objectives:** To study the position, height and shape of mandibular lingula among Malaysian adult population. **Methods:** A cross-sectional study of the shape, height, and location of the lingula in relation to surrounding structures was done on retrospective data of cone-beam computed tomographic images. The shape of the lingula was classified into triangular, truncated, nodular, and assimilated types. The location was determined by five distances from the lingular tip to: the anterior and the posterior borders of the mandibular ramus, the mandibular notch, the distal surface of the mandibular second molar, and the occlusal plane. **Results:** Triangular shape of the lingula was most commonly found [39.2 % (80)]. The mean height of the lingula was 16.26 ± 4.09 mm. The mean distance of lingula from the anterior borders of mandibular ramus was 12.79 ± 1.92 and 15.52 ± 2.36 mm from posterior borders. The lingula was located 31.27 ± 3.89 mm from the distal side of mandibular second molar tooth. **Conclusion:** The present study found out that the lingula was positioned slightly higher than the occlusal plane at a distance of 5.84 ± 2.47mm and 12.79± 1.92mm from anterior border of ramus. This valuable data will assist surgeons to localize the lingula and avoid unnecessary intraoperative complications.

(CS 11) Osteoporosis knowledge among women attending Hospital Universiti Sains Malaysia

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Introduction: Osteoporosis is a degenerative bone disease characterised by decreased bone mass and microstructural deterioration of bone tissue leading to bone fragility and increased fracture risk. Osteoporosis affects more women than men, especially women who have reached menopause. It is a public health problem that is becoming increasingly prevalent with the aging of the world population. **Objectives:** The objective of this study was to assess knowledge about osteoporosis among women attending Klinik Rawatan Keluarga (KRK) Perubatan, Hospital Universiti Sains Malaysia (USM). **Methods:** A total of 100 women participated in this cross-sectional study. A validated 20-item Osteoporosis Knowledge Assessment Tool (OKAT) was used to assess the women's osteoporosis knowledge. With three response options, "True", "False", and "Do not know", a score of 1 was given to each correct response, and 0 to each incorrect or "Do not know" response. The total OKAT score may thus range from 0 to 20, with a higher score indicating better knowledge. Additionally, information about the women's sociodemographic characteristics (age, ethnic group, highest education level and monthly household income) was obtained. **Results:** The mean age of the women was 31.4 years (S.D. 11.73). The mean total OKAT score was 7.2 (S.D. 2.66). None of the sociodemographic characteristics have significant association with the mean total OKAT score of the women. **Conclusions:** Knowledge on osteoporosis among women attending KRK Perubatan, Hospital USM was generally limited. Specific educational programme or health talk should be planned to increase knowledge regarding osteoporosis particularly on prevention of osteoporosis among the women.

(CS 12) Oral manifestation and caries experience in pre-dialysis chronic kidney disease patients

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Introduction: Patients with chronic kidney disease (CKD) are prone to develop oral lesions due to the disease process or the therapy or both. Pre-dialysis group of CKD patients (stage 3 and 4) are chosen because complications and systemic problems will arise at these stages.

Objectives: This research was conducted to study the oral manifestation and caries experience of pre-dialysis CKD patients in Hospital Universiti Sains Malaysia (HUSM).

Methods: Fifty-eight patients, which consist of 29 CKD patients and 29 controls aged more than 18 were recruited. CKD patients of stage 3 and 4 who attended medical specialist clinic (KPP) of nephrology and CKD resource centre unit of HUSM were selected. The control group consists of healthy patients without any systemic disease who attended their dental appointment in dental clinic HUSM. The patients were interviewed for any oral complaints such as dry mouth, bad breath, and taste change; and were examined for oral changes such as mucosal pallor and ulceration. The decayed-missing-filled index (DMFT) for every patients were also recorded. **Results:** Oral lesions were present in 96.6% of CKD patients and 51.7% of control group ($p < 0.001$). The significant oral manifestations in CKD patients were xerostomia, halitosis, abnormal taste, mucosa pallor, enamel hypoplasia, gingival enlargement and abnormal lip pigmentation. There was significant difference in caries experience between CKD patients and healthy controls. There was no correlation between estimated glomerular filtration rate (eGFR) and caries experience of the CKD patients. **Conclusion:** Pre-dialysis CKD patients exhibit higher risk of developing oral manifestations and higher caries experience compared to healthy controls.

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(CS 13) A survey of anterior composite resin restoration preference among general dental practitioners in Pulau Pinang

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Introduction: Aesthetic dentistry is increasing in demand worldwide. Many dental restorative materials are developed in order to improve its structures in relation to longevity and aesthetical component. Composite resin has been widely used as dental restorative material among dental practitioners. Composite resin restoration is being increasingly selected for anterior and posterior restorations with its improvement in strength and microhardness. The bonding of composite resin to tooth structure is based on micromechanical bonding, which requires good adhesion between tooth structure as well as restorative material. Various factors could affect the quality of an anterior composite restoration, such as composite resin material, type of light cure unit, use of rubber dam and also technique used. **Objectives:** To assess and identify the general dental practitioners' preferences regarding different procedures in anterior composite restoration as well as to assess if the clinical experience or post-graduate training will affect the preferences of the general dental practitioners. **Methods:** A questionnaire survey consisting of sociodemographic data and anterior composite resin restoration preferences was conducted among 64 general dental practitioners in the private sector in Pulau Pinang, Malaysia. **Results:** There is significance value for association between clinical year experience and microhybrid, microfilled and nanofilled composite material, rubber dam usage and zinc aluminium oxide polishing bur. There is also significance value for association between post-graduation training and bevelling procedure. **Conclusion:** There are variances of anterior composite resin restorations procedures and preferences among general dental practitioners. They have association with years of clinical experience and post-graduate training.

(CS 14) Prevalence and association of orbital trauma and traumatic optic neuropathy with zygomatic complex fracture and treatment outcome amongst patients attending Hospital Universiti Sains Malaysia from 2013-2015

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Introduction: The zygomatic complex refers to a combination of the zygomatic bone, frontal process of the maxilla, and zygomatic portion of the temporal bone. Traumatic optic neuropathy is a serious vision threatening condition that can be caused by ocular or head trauma. The vision loss may vary from mild to total blindness. The incidence of it after craniofacial trauma has been reported to be 2-5%. **Objectives:** To study the prevalence of orbital trauma and traumatic optic neuropathy with zygomatic complex fracture in patients attending Hospital Universiti Sains Malaysia from 2013-2015. **Methods:** A total of 118 patients with zygomatic complex fracture were included in this retrospective study. Patients were assessed for aetiology of fracture grouped into seven categories. The occurrence of traumatic optic neuropathy, traumatic mydriasis, relative afferent pupillary defect (RAPD) in association with the zygomatic complex fracture was assessed. For patients with these conditions, the administration of medications and surgery performed was documented with the effect of these treatment. **Results:** Of 118 zygomatic complex fracture cases, (18.6%) were diagnosed with traumatic optic neuropathy, (11.9%) with traumatic mydriasis and (19.5%) with RAPD, Patients' mean age was 29 years old. The most common cause for fracture was motorcycle accident. (28.8%) were given medications and (36.4%) had surgery. For those who had traumatic optic neuropathy and/or traumatic mydriasis, (40.0%) underwent surgery and 10 out of 12 cases showed improvement. There was no correlation between surgical reduction and outcome of ophthalmic conditions post-operatively. **Conclusion:** Surgical approach cannot affect the outcome of traumatic optic neuropathy.

(CS 15) Assessment of gingival maturation index and gingival index after gargling 2.5% edible bird's nest extract mouthwash in moderate gingivitis patients

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Introduction: Gingivitis has a high incidence and affects epithelial maturation of gingiva by decreasing superficial cell number. Edible bird's nest (EBN) is one of the most highly valued food products in South East Asia, yet the use of it in dentistry has never been heard. EBN contains sialic acid and epidermal growth factor that can reduce inflammation and increase cellular maturation. **Objectives:** The aim of this study was to investigate the effect of 2.5% EBN extract on gingival maturation index and gingival index of moderate gingivitis patients. **Methods:** Twenty (20) moderate gingivitis subjects were divided into control and treatment group. The patients on control group were treated with 0.1% chlorhexidine gluconate while the treatment group were treated with 2.5% EBN extract. Each subject was instructed to gargle 10 ml of mouthwash twice a day for 5 consecutive days. Epithelial smear samples were taken using cytobrush on the 1st day before the treatment and 6th day after gargling. Gingival index scoring from each patients was also performed on that day. The samples were stained using papanicolaou staining before observation under light microscope to examine the basal-parabasal, intermediate, and superficial cells. **Results:** The result of this study shows that the gingival maturation index and gingival index after gargling in control group and treatment group shows no difference statistically ($p < 0.05$). **Conclusion:** It can be concluded that the use of 2.5% EBN extract could shift gingiva maturation to normal and has the same effect to chlorhexidine gluconate 0.1%.

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Oral Presentations – Public Health

(PH 1) Knowledge, attitude and risk perceptions among USM dental students towards patients with human immunodeficiency virus (HIV), Hepatitis B virus (HBV) and Hepatitis C virus (HCV) infections

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Introduction: Dental personnel including dental students manage in dental clinic not limited to healthy patients but also patients with infectious diseases such as HIV, HBV and HCV.

Objectives: To determine and compare knowledge, attitude and risk perceptions between pre-clinical and clinical year students towards patients with HIV, HBV and HCV infections. **Methods:** A cross-sectional study is conducted on 233 dental students' batch 2017/2018 in USM. A self-administered questionnaire regarding knowledge, attitude and risk perceptions towards HIV, HBV and HCV patients was used. The collected data was analysed with SPSS 24.0. Chi Square test was used to compare the knowledge, attitude and risk perceptions between pre-clinical and clinical dental students. Significant level was set at $p < 0.05$. **Results:** Most of the students were Malay (51.9%) and female (67.4%). Regarding the knowledge, most of the students answered wrongly about transmission of HIV. Ninety five percent of them believed that HIV can be transmitted through air or water. There are 76.4% of the students agreed that dentist have a professional obligation to treat HIV patients. Most of the students agreed that all patients should be considered potentially infectious. The independent t-test showed that significantly dental students in clinical years had better knowledge, attitude and risk perception compared to pre-clinical years with mean difference of 2.39, 0.77 and 0.68 respectively ($p < 0.05$). **Conclusion:** The knowledge, attitude and risk perceptions of dental students in USM were relatively low. The clinical year students are better of knowledge, attitude and risk perceptions towards patient with HIV, HBV and HCV infections compared to pre-clinical students.

(PH 2) Common chief complaints and associated factors seeking dental treatment among young adults at Hospital USM dental clinic

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Introduction: Oral health condition and status for majority of Malaysian population was systematically monitored through incremental dental care programme. In this program, their oral status was monitor as early as they enter pre-school and completed only when they leave secondary school. Hence, after leaving the school, their oral health status was unknown especially those who fall in young adults categories which is from 18 to 39 years of age. Therefore, this study was proposed to explore the oral health status and the main chief complaint in seeking dental treatment among young adults to Hospital USM dental clinic for the past 12 months. **Objective:** To assess the common chief complaints and factor associated with chief complaints among young adults seeking treatment at HUSM dental clinic. **Methods:** This cross-sectional study evaluated 88 patients aged 20 years old to 39 years old attended Hospital USM dental clinic from 1st January 2017 to 31st December 2017. Patient's dental record was obtained from the medical record unit and data on socio-demographic and main dental complaints were recorded. **Results:** The most common chief complaints recorded were toothache (25.0%), tooth cleaning (20.5%) and others (17.0%). Most patients were female (59.1%). Race wise, Malays were the majority at 94.3%. Their mean age were 26.88 years of age with tertiary education (56.8%) while people with career (54.5%). **Conclusion:** In conclusion, chief complaint is an essential component of the dental history, with pain and tooth cleaning being the most commonly reported.

(PH 3) Self-perceived preparedness for practice of undergraduate dental student in Universiti Sains Malaysia Health Campus

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Introductions: Dental education aims to prepare and produce competent students that can work independently with the ability to provide excellent care to patients. **Objective:** The objective of this study was to determine the self-perceived preparedness for practice among undergraduate dental students in Universiti Sains Malaysia (USM) in terms of clinical, cognitive and behavioural preparedness. **Methods:** We used a validated self-administered, Dental Undergraduates Preparedness Assessment Scale (DUPAS). All final year undergraduate dental students were invited to participate in the study. Data entry and analysis was done using SPSS version 24. **Results:** A total of 45 respondents had participated in the study yielding a response rate of 95.7% and most were female students (71.1%). The total self-perceived preparedness mean score was 87.76(SD=9.030). The mean scores for clinical, cognitive and behavioural preparedness were 45.98(SD=2.463), 6.96 (SD=2.205) and 34.82 (SD=6.250) respectively. We found no statistically significant differences for gender and races in self-perceived preparedness ($p>0.05$). **Conclusion:** Final year undergraduate students in USM dental school have high level of preparedness in terms of cognitive, clinical and behavioural aspects. It shows that they are well prepared and capable of performing their duties as dentists by the time they graduate.

(PH 4) Sweetness intensity, pleasantness, and tolerance ratings of sweetened tea in Kelantanese subjects

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Introduction: Sugar consumption was reported to be higher in Kelantan due to their preference for sweet taste. **Objective:** To explore the potential application of gLMS ratings to describe the preferred level of sweetness intensity, pleasantness and tolerance of sweetened drinks in a 'sweet tooth' population. **Methods:** This cross-sectional study recruited 60 Kelantanese subjects to participate in the study conducted at Dental Clinic, Hospital Universiti Sains Malaysia, Kubang Kerian, Kelantan. Samples of tea with different sugar concentrations (0, 3.36, 6.72, 10.08, 13.44 and 20.16 % w/v) and a Coca-cola drink (10.6 %w/v) were prepared. Subjects were asked to taste the samples and rate the sweetness intensity, pleasantness and tolerance level using gLMS and; washed-out the after-taste effect by chewing a sugar-free biscuit and rinsing with distilled water between samples. **Results:** Sweetness intensity were found to increase as sugar concentration increases and, both the greatest pleasantness and tolerance were rated as strong at means 22.2 gLMS and 29.9 gLMS respectively. For sweetness intensity, 87% and 70% rated concentrations at 6.72 %w/v and 10.08 %w/v respectively as moderate/strong. Most participants (76.7%) rated sugar concentration at 6.72 %w/v as the most pleasant and more than 60% were able to tolerate sugar concentrations between 3.36 %w/v to 10.6 %w/v. **Conclusion:** Despite the high amount of sugar, the sweetness intensity at concentration 6.72 %w/v, which correspond to 4 teaspoons per 250ml of tea, were perceived as the most pleasant and well tolerated in Kelantanese subjects. Thus, this is somewhat consistent with the claim that Kelantanese are having sweet tooth behaviour.

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(PH 5) Factors associated with skipping breakfast among dental undergraduate students at Universiti Sains Malaysia (USM)

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Introduction: Meal skipping defined as an omission of the meals such as breakfast, lunch or dinner throughout the day. Among those meals, breakfast is the most important meal of the day as it follows the longest period of fasting, however many students skip breakfast due to the reason of lack of time. **Objective:** To study the associated factors in skipping breakfast among the dental undergraduate students of USM. **Methods:** This is a cross-sectional study among dental undergraduate students of USM. A total of 410 (n=410) was selected in this study and the factors associated was identified using a self-administered questionnaire. **Results:** The prevalence of skipping breakfast among dental undergraduate students of USM was high (87.1%). Furthermore, the prevalence was 83.3% and 89.7% for skipping breakfast among the non-clinical and clinical dental undergraduates respectively. However, there is no significant association between the clinical statuses of the students. There is an association between skipping breakfast and lack of time to eat breakfast ($r=0.363$, $p=0.001$), and between non-clinical and clinical students who skips breakfast and lack of time to eat breakfast. **Conclusion:** Many of the students, both non-clinical and clinical, skips breakfast. However, there is no association between them. Skipping breakfast among them was associated to many factors especially the lack of time for breakfast. Between the non-clinical and non-clinical students there are associated factors for skipping breakfast, which includes lack of time to eat breakfast. A breakfast education program to teach the importance of taking breakfast would prove meaningful for these students.

(PH 6) Satisfaction survey amongst dental students towards learning experience in Universiti Sains Malaysia

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Introduction: Student satisfaction helps to build self-confidence, and self-confidence helps students to develop useful skills and acquire knowledge. Their perspective is obtained where improvements can be made to enhance overall learning experience for current and future dental students. **Objectives:** To assess the learning experiences offered by Universiti Sains Malaysia to its fourth and fifth year dental students and its level of satisfaction as perceived. **Methods:** A cross-sectional study conducted on fourth and fifth year undergraduate dental students. The respondents were selected using simple random sampling. Data collection is carried out using "National Student Survey" which is adapted from Ipsos MORI. **Results:** The outcome of this survey suggest relatively high student satisfaction levels with the overall satisfaction index of 75.06. The dimension of 'learning opportunities' (82.36) ranked the highest, and conversely, the lowest figures from 'organization and management' (69.31). The overall level of satisfaction between fourth year [4.41(0.51)] and fifth year dental students [4.60(0.55)] is not significantly different. Gender has no correlation with the level of satisfaction on different dimensions of learning experiences. Results shows that there is high positive correlation between 'learning opportunities' and 'teaching on my course' and 'organization and management' and 'assessment and feedback' but very weak correlation between 'learning resources' and 'teaching on my course'. **Conclusion:** The dimension of 'organization and management' must be improved by working on the issues raised by students to increase student satisfaction level.

(PH 7) Prevalence of smoking among dental students of Universiti Sains Malaysia

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Introduction : Smoking was reported to link with respiratory, cardiovascular, neurological and oral diseases. Recent trends suggest young adult have the risk of picking up smoking habit. Dental students have an important role in promoting smoking cessation awareness while educating patients on oral disease prevention and general health promotion during their studies as well as after becoming a dental practitioner. **Objective :** To determine the percentage of dental student in Universiti Sains Malaysia (USM) who smoke and to identify the possible risk factors associated with their smoking habit. **Methods:** Data on smoking habits, smoking factors, cessation plan, and sociodemographic status is collected by 92 distributed questionnaire using convenience sampling method. Pearson Chi-Square test with P-value set at 0.05 with 95% confidence interval and logistic regression analysis were used to identify significant differences between groups and compute odd ratios respectively using SPSS version 24.0. **Results:** Our results showed that the prevalence of smoking is 6.5%. All current smokers were found to be male (6 people) with 83.3% are Malay and 16.7% are other races ($p < 0.05$). There is a higher likelihood of cigarette smoking if students originated from rural residency (OR = 9.75, 95% CI = 1.68-56.56) and those have close friends who smoked has 10 times tendency to become a smoker (OR = 10.29, 95% CI = 1.72- 61.69). **Conclusion:** Approximately one in every twenty undergraduate dental students at USM is a current smoker and it's associated with students' sex, race, original residency and having close friends who smoked.

(PH 8) Assessment of periodontal status during pregnancy

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Introduction: The prevalence of periodontal disease among pregnant women has been well-documented, ranging from 35% to 100%, which might affect their quality of life. **Objectives:** To determine the prevalence of periodontal status among 2nd and 3rd trimester pregnant women attending the Obstetrics & Gynaecology (O&G) Clinic, Hospital Universiti Sains Malaysia (HUSM) and the association between the oral health-related quality of life with them. **Methods:** This study conveniently recruited 81 women at 2nd and 3rd trimester of pregnancy attending the O&G Clinic, HUSM. A questionnaire which included Oral Health Impact Profile (OHIP)-14 items were administered followed by dental examination, which were probing pocket depth [PPD (mm)], clinical attachment level [CAL (mm)], plaque index [PI (%)] and bleeding on probing [GI (%)]. **Results:** The mean PPD was 4.12 (0.15), mean of sites with PPD \geq 4 mm was 38.6 (22.51) and mean percentage of sites of PPD \geq 4 mm 23.45 (13.03). The mean PI and GI were 49.25% (16.92) and 31.34 (18.04) respectively. The mean no of sites of PI and GI were 54.69 (18.98) and 34.46 (19.40) respectively. The prevalence of women who reported any oral health problem impact measured by the OHIP-14 was higher in the 3rd trimester group. However, there was no difference existed between the different trimesters, for both dental examination and OHIP-14 questionnaire. **Conclusion:** Generally the 2nd and 3rd trimester pregnant women has PPD \geq 4 mm, however, there is no significant difference existed between the 2nd and 3rd trimester.

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(PH 9) Factors associated with oral health literacy among patients with type 2 diabetes mellitus attending Hospital Universiti Sains Malaysia

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Introduction: Patients with diabetes mellitus are at higher risk for oral diseases due to impaired immune responses. Studies have shown that oral health outcomes are associated with oral health literacy (OHL). **Objectives:** This study determined OHL level and the associated factors among patients with type 2 diabetes mellitus attending Hospital Universiti Sains Malaysia. **Methods:** A total of 135 patients participated in this cross-sectional study. The Malay version of Oral Health Literacy Instrument (OHLI-M) was used to assess the level of OHL among respondents. An additional self-administered questionnaire was used to obtain other variables of interest including socio-economic information and perceived oral health status and problems. **Result:** Most respondents have at least one oral health problem (62.2%). The most common problem was cavitated tooth (42.2%). Other problems include toothache (17.8%), mobile tooth (17.8%), and swollen gums (16.3%). OHL level for most respondents (40.7%) was inadequate. The mean total OHLI-M score was 67.9 (SD 17.74). OHL score was significantly lower in the following respondents: females, no formal education or had primary education, unemployed, have lower income, never go for dental visit, had swollen gums, and wore full dentures. **Conclusion:** Oral health problems were common in type 2 diabetes mellitus patients in this study, and patients with periodontal symptom had lower OHL. This study also highlighted the link between OHL and socio-economic factors. Improving OHL of patients may increase their capability to obtain and understand oral health messages needed to make appropriate actions that will eventually prevent oral diseases associated with diabetes mellitus.

(PH 10) Oral health knowledge, attitudes and practices of preschool teachers in Ketereh and Kubang Kerian

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Introduction: A structured preschool oral health programme has been implemented in Malaysia since 1984 where teachers play an essential role in educating oral health care among preschool children. However, fewer studies have been done to determine their oral health knowledge, attitudes, practices and also their approaches toward implementing oral health education. **Objective:** To evaluate the knowledge, attitudes, and practices of preschool teachers towards oral health and also to assess their approaches to implement oral health education in preschool children. **Methods:** A cross-sectional study was conducted to collect data from preschool teachers (n=100) in Ketereh and Kubang Kerian, Kelantan using a close-ended questionnaire. **Results:** According to the results of the study, majority of the preschool teachers showed a good knowledge on oral health. Eighty-one percent of the preschool teachers knew irregular toothbrushing may cause dental problem. Preschool teachers also have positive attitudes on oral health. All preschool teachers have visited dentist before. Moreover, they also demonstrated a good practice on oral hygiene habit with 97% of them brushed more than two times per day. Most of the preschool teachers did incorporate importance of oral health in educating school children. Only 2% of them made no attempt to give education on oral health. **Conclusion:** Overall, preschool teachers had a good knowledge, positive attitudes, appropriate practices and favorable approaches. However, not all the preschool teachers are well trained. So, there is a need to have organized training module for them on oral health education.

(PH 11) The correlation between dental caries experience and oral health-related quality of life (OHRQoL) among 13-year-old school students in Kota Bharu, Kelantan

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Introduction: Dental caries may cause pain and discomfort that affects oral health-related quality of life (OHRQoL). **Objectives:** To determine the caries experience and OHRQoL of school students in Kota Bharu, Kelantan and their correlation. **Methods:** A cross-sectional study was conducted on 196 school students aged 13-year-old from SMK Kubang Kerian 1. The sociodemographic characteristics data of the students were obtained. Caries experience was assessed using DMFT index and OHRQoL was determined via validated S-OHIP(M) questionnaire. Number of untreated dental caries was extracted based on D of DMFT index. SPSS version 24.0 was used for data entry and analysis. The correlation between caries experience and S-OHIP(M) score, and number of untreated dental caries and S-OHIP(M) score were analysed using Spearman rank correlation test. The p -value was set at <0.05 . **Results:** The response rate was 83.16%. All of them were Malay, with 54.6% male and 45.4% female. Prevalence of caries was 48.0% (95% CI: 40.9, 55). The median (IQR) of DMFT was 0(2) with the range of 0-11, and median(IQR) of untreated dental caries was 0(0) with the range of 0-8. The median(IQR) of S-OHIP(M) score of the students was 10.00(10) with the range of 0-39. No significant correlation was found between caries experience and S-OHIP(M) scores ($p=0.163$). However, significant positive correlation ($r=0.169$, $p=0.031$) was found between number of untreated caries and S-OHIP(M) score. **Conclusion:** Untreated dental caries showed a significant negative impact on OHRQoL of 13-year-old school students in Kota Bharu, Kelantan.

(PH 12) The efficacy of dental floss in addition to toothbrushing compared to toothbrushing alone in plaque removal

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Introduction: The debate over the effectiveness of flossing as a form of mechanical plaque control is still on-going. **Objective:** This study compared the efficacy of plaque removal between flossing and toothbrushing combined and, toothbrushing alone using two different plaque measurement methods. **Methods:** This cross-over clinical trial recruited 47 dental students of Universiti Sains Malaysia. Participants were asked to abstain from performing any oral hygiene procedures for 12 hours prior to plaque assessment which was carried out before and after intervention. They were asked to carry out toothbrushing only in the first intervention and, toothbrushing and flossing in the second intervention after at least 3 days of wash-out period. Quantitatively plaque was measured using the Turesky modification of the Quigley & Hein Index and Wolffe Index. **Results:** The plaque score means of the Turesky modification of the Quigley & Hein and Wolffe indices were significantly reduced after performing both the mechanical plaque control methods ($p<0.05$). The plaque score mean of the Turesky modification of the Quigley & Hein index was not different between both methods. However, the plaque score mean of Wolffe index after flossing and brushing was statistically and significantly lower than brushing alone (mean difference = 1.424, 95% CI: 1.130, 1.717) ($p<0.001$). **Conclusion:** A combination of flossing and toothbrushing removes more plaque than toothbrushing alone, particularly at the proximal tooth surfaces.

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(PH 13) Oral health-related quality of life and satisfaction among fixed dental prostheses users in a university hospital, Kelantan

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Introduction: In Malaysia, edentulism has become a problem among adults and the elderly. The loss of teeth will also negatively impact their quality of life. Elderly patients with serious dental issues may face difficulties in mastication, phonation as well as engaging in social interactions which may affect their general health. Satisfaction, on the other hand, is a crucial aspect of measuring quality in health care which includes clinical outcomes, patient retention, and medical malpractice claims.

Objectives: The present study was conducted to assess the level of oral health-related quality of life and satisfaction and its associated factors among fixed dental prostheses users.

Methods: The short Malaysian Oral Health Impact Profile [S-OHIP(M)] and a modified satisfaction questionnaire were used to collect data from one hundred and forty patients wearing fixed prostheses. The questionnaires contained questions on the frequency of problems affecting their oral health quality of life (OHRQoL) and the patients' perception of the overall outcome of the prosthetic treatment.

Results: The results indicate that the patients almost never have any problems with their fixed prostheses and are mostly totally satisfied with the treatment. The results also show that there is a moderate positive correlation between brushing frequency ($r=0.241$, $p=0.004$) and the OHRQoL. It also showed that there is a negative correlation between the work status of the patient ($r=-0.154$, $p=0.069$) and their satisfaction. **Conclusion:** A majority of patients were satisfied with their fixed prosthesis and had good OHRQoL.

(PH 14) Oral cancer awareness and early detection knowledge among undergraduate clinical year dental and medical students in Universiti Sains Malaysia (USM), Malaysia

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Introduction: Oral cancer accounts for 11% of cancer-related deaths in South and Southeast Asia. Its initial lesion is almost symptomless. A lack of awareness and inadequate early detection knowledge of clinicians have significant effect on morbidity and mortality in Malaysia due to delays in referral and treatment.

Objectives: The objective of this research was to study on oral cancer awareness and early detection knowledge among undergraduate dental and medical clinical year students (Year 3, 4 and 5) in Universiti Sains Malaysia regarding epidemiology, aetiology, clinical features, treatment, prognosis, and prevention of oral cancer. **Methods:** A validated, self-administered questionnaire with 36 questions was used. The questionnaire was participated by 229 medical students and 126 medical students from undergraduate clinical years.

Results: Undergraduate clinical year dental students were relatively more comprehensive than medical students in oral cancer awareness and early detection knowledge. However, more than one-third of questions were answered correctly by less than 50% of the students. To some extents, dental students did not differ significantly from the medical students in eliciting correct answers. More than half of the dental and medical students (51.6% and 68.1% respectively) expressed low level of confidence on self-evaluation of knowledge concerning oral cancer prevention and detection. **Conclusion:** This study demonstrated areas of deficiency of the students in awareness and early detection knowledge of oral cancer. It highlights the necessity to strengthen the curricula concerning these aspects to improve medical and dental undergraduate education.

(PH 15) Factors influencing requirement's implementation of clinical dental student of Muhammadiyah University of Yogyakarta

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Introduction: Institution of Dentist Education which requires professional students to meet a number of requirements tend to get constraints, such as delay in graduation due to students' unable to meet all the requirements. This constraint relates to important factors in professional education, namely lecturer factor, patient factor, and student factor. **Objectives:** This study aimed to understand the factors that influence the fulfillment of the requirements of clinical dental students of Muhammadiyah University of Yogyakarta (UMY). **Methods:** This research was an observational research with cross sectional design. Research subjects amounted to 100, taken by purposive sampling technique. Research data consisted of primary and secondary data. Primary data were obtained from answers to questionnaires and secondary data were obtained from reports management information system. Research data were analyzed by Pearson correlation and multiple linear regression. **Results:** Pearson correlation analysis results obtained significance value of the three factors of 0.000 ($p < 0.05$). The result of multiple linear regression analysis showed that lecturer factor had significance value 0.003 ($p < 0.05$), patient factor had significance value equal to 0.013 ($p < 0.05$), and student factor had significance value equal to 0.001 ($p < 0.05$). The contribution of these three factors had an influence of 41.9%, the remaining 58.1% was determined by other variables that were not include in this study. **Conclusion:** Lecturer factor, patient factor, and student factor have relevance and influence the fulfillment of the requirements of clinical dental students of UMY.

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ePoster Presentation

(POS 1) An application of Box-Cox Transformation to health sciences data: A case study

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Introduction: In any statistical analysis, the normality distribution of data plays an important role in determining whether the data undergoes parametric or non-parametric analysis. However, there is an alternative where the researcher can opt for parametric analysis even if the data is not normally distributed. One of the methods that will be highlighted in this research is the application of Box-Cox Transformation method on not normally distributed data. **Objectives:** To apply Box-Cox Transformation method on not normally distributed data and determine the status of normality of the data after Box-Cox Transformation. **Methods:** Normal probability and residual plot was used to assess the normality of a sample (health science data). The data is normally distributed when $p \geq 0.05$, whereas it is not normally distributed if $p < 0.05$. In not normally distributed data, Box-Cox Transformation was applied on the sample data. Then, the normality of transformed data was assessed using probability plot through residual value. **Results:** In the first, second and fourth case, the data was not normally distributed ($p < 0.05$). These cases showed improvement in normality ($p > 0.05$) after undergoing Box-Cox Transformation. For case 3, the initial data was quite normal ($p = 0.068$). The normality of the data improved ($p = 0.927$) after the application of Box-Cox Transformation. **Conclusion:** The dataset that originally does not follow normal distribution can now undergo parametric analysis after Box-Cox Transformation Method was applied.

(POS 2) Comparison of push out bond strength in between different type of cements and different type of fiber post

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Introduction: Endodontically treated teeth may require posts for retaining the core and replacing the coronal structures that has been lost. **Objectives:** To evaluate and compare the push out bond strength level between different types of posts cemented with different type of luting cements. **Methods:** In this *in-vitro* study 48 permanent maxillary anterior incisors were decoronated and the roots were treated endodontically. The roots were classified into four groups of 12 specimens each following post space preparation. Cementation was done with different types of posts and cements: 1) GC everStickPOST (Stick Tech Ltd, Turku, Finland), 2) ParaPost FiberLux (Coltene, Whaledent, USA), 3) G-CEM (GC Corporation, Tokyo, Japan) and 4) Rely-X Unicem (3M Espe AG, St. Paul, MN, USA). Push-out test was performed with a universal testing machine at a crosshead speed of 0.5mm/ min and the bond strength values were evaluated. **Results:** The mean push-out bond strength was highest for group Parapost FiberLux+Rely-X Unicem (21.23 ± 13.61) followed by group Parapost FiberLux+G-CEM (16.16 ± 9.52) and group GC everStickPOST+Rely-X (12.3 ± 7.59). The lowest mean push-out bond strength was seen with group everStickPOST+G-CEM (0.76 ± 0.77). There were statistically significant differences seen in the push-out bond strength between the groups using Kruskal-Wallis analysis and Mann-Whitney test ($p < 0.05$). **Conclusion:** Mean push-out bond strength was highest for Parapost FiberLux and Rely-X Unicem compared to GC everStickPOST and G-CEM.

(POS 3) Evaluation of degree of conversion and hardness of flowable resin composites from rice husk

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Introduction: It is important to evaluate the mechanical properties of the newly experimental flowable composites namely degree of conversion and hardness to ensure the performance of the new formulations. **Objectives:** This study aimed to evaluate the degree of conversion and hardness of experimental flowable resin composites derived from rice husk in comparison to commercialized counterpart. **Methods:** One commercial flowable composite (Filtek Z350 XT, 3M ESPE) and three experimental flowable composites with different loading of Bis-GMA at 40% (EF40B), 45% (EF45B) and 50% (EF50B) were tested. Six specimens were prepared from each material. Specimens were cured from the top surface for 40 seconds. Degree of conversion (DC) was determined using Fourier transform infrared spectroscopy (FTIR). A microhardness tester was used to measure the Vickers hardness number (VHN) on top and bottom surfaces of each specimen. Data for DC and VHN were analyzed by ANOVA followed by post hoc test. **Results:** Filtek Z350 XT recorded the highest DC, however it was not significantly different ($p>0.05$) from experimental groups. The VHN mean values for Filtek Z350 XT was significantly higher ($p<0.05$) from experimental groups. Among the experimental groups, there was a pattern of increased VHN with decreased Bis-GMA loading for top surface. **Conclusion:** The DC of all experimental flowable composites was comparable to commercialized counterpart whilst VHN of experimental flowable composites was lower than that of commercialized counterpart.

(POS 4) Reproductive performance of Sprague Dawley rats in open cages and individually ventilated cages

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Introduction: Sprague Dawley rat has been used widely in biomedical research due to its calmness and ease of handling. Housing systems are an important element in the well-being of laboratory animals and consequently influence the outcomes of animal experiments. Hence, specialised housing system such as the individually ventilated cages (IVC) was designed to assist in maintaining a clean and pathogen-free environment which associated with better reproductive performance. **Objectives:** This current study was aimed to evaluate the reproductive performance of Sprague Dawley rats in open cages and IVC. **Methods:** Three monogamous pairs of rats each were naturally mated for 3 breeding cycles in open cages and IVC. After ± 21 days, the number of pups born were observed. By 4 weeks of age, all pups were weaned. The survival and weight of each pups were recorded for each pair. Both types of cages system were maintained in the same location in ARASC with standardized environmental parameters including temperature, floor space, humidity, general ammonia level and room light intensity. **Results:** Results showed that the average number of pups at birth and their survival at weaning age per pair for open cages were slightly lower than IVC. Meanwhile, the average weaning weight of pups were slightly higher in open cages than IVC. **Conclusion:** The reproductive performance of Sprague Dawley rats in IVC is slightly better than open cages.

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(POS 5) Study of root and canal morphology of maxillary second molars in Malay patients with the aid of cone-beam computed tomography

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Introduction: The objective of root canal treatment is to achieve bacteria-free environment by performing thorough chemical and mechanical cleansing and complete obturation in all root canals. Therefore, a detailed understanding of tooth anatomy is critical for the success of endodontic treatment.

Objective: This study investigated the root and canal morphology of permanent maxillary second molars in Malay patients using cone-beam computed tomography (CBCT) imaging.

Methods: This study evaluated 536 maxillary second molars from 268 patients who previously received CBCT scanning for various procedures. The number of roots, prevalence of second mesiobuccal (MB2) canal in the mesiobuccal (MB) root, its association with sex, as well as the prevalence of bilateral MB2 canals is evaluated. **Results:** Three roots were most commonly found in maxillary second molars (80.0%). MB2 canals were found in 35.2% of three-rooted maxillary second molars. The most common canal configuration in the MB root of maxillary second molars was type I (64.8%), followed by type IV (10.0%) and type II (9.1%). The prevalence of MB2 canals in maxillary second molars among male was significantly higher ($p < 0.001$) than female. Bilateral MB2 canals were presented in 58.3% of patients. **Conclusion:** CBCT imaging is an effective aid to investigate root and canal morphology. Maxillary second molars typically present with three roots. The prevalence of MB2 canals in maxillary second molars is approximately 35% with slight male predilection. Bilateral occurrence of MB2 canals in maxillary second molars are common. Our findings may help endodontists to improve the outcome of endodontic treatments.

(POS 6) Seroprevalence of toxoplasmosis among blood donors in Hospital Universiti Sains Malaysia: A pilot study

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Introduction: Toxoplasmosis is an infection caused by *Toxoplasma gondii*. Infected healthy adult is usually asymptomatic. However, if pregnant women and immunocompromised patients are infected, it might lead to serious complication. This obligate intracellular parasite affect humans through contaminated food or water, raw meats, blood transfusion and organ transplant. **Objectives:** The aim of this study is to determine the seroprevalence of toxoplasmosis among blood donor in Hospital USM. **Methods:** The whole blood sample was collected from left over sample from volunteer blood donor. Age, gender, ethnic, employment and blood group were retrieved from the record office. Serological testing was done using enzyme-linked immunosorbent assay for IgG and IgM antibodies of *T. gondii*. Samples that were positive for IgG antibodies was further tested for IgG avidity. Low avidity indicates recent infection < 20 weeks and high avidity indicates past infection. **Results:** Fifty-six blood donors were involved in the study where 46.43% were positive for IgG antibody and 3.57% (2 blood donors) were positive for both IgG and IgM antibodies. Those two samples were tested for IgG avidity where one showed high IgG avidity and the other showed low avidity. Seropositivity is significantly associated with employment ($p = 0.009$) but not significantly associated with age, gender, ethnic and blood group. **Conclusion:** Seroprevalence of toxoplasmosis is high among blood donors in Hospital USM. Since this is a pilot study, more samples are needed to establish the data. Since the infection can be transmitted via transfusion, screening for toxoplasmosis might be considered in the future.

(POS 7) Morphometric analysis of foramen magnum in Malaysians based on three-dimensional computed tomography (3D-CT)

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Introduction: Foramen magnum is a large opening in the base of skull through which the spinal cord exits the cranial vault. Information regarding the morphology and dimensions of foramen magnum among Malaysians was still unknown. It is also an important indicator for sexual dimorphism. **Objectives:** The aim of this study is to compare the length, width, and area of foramen magnum between Malaysian males and females using three-dimensional computed tomography (3D-CT). **Methods:** Two hundred high resolution CTs (100 males, 100 females) from subjects aged 20 – 60 years were obtained from the archives of the Radiology Department, Hospital Universiti Sains Malaysia (HUSM). CT images were taken using GE Light Speed Plus (General Electric, USA) and Siemens Somatom Definition AS+ (Siemens, Germany) CT scanners. 3D reconstruction of the images and measurements of dimensions of foramen magnum were performed using Mimics V17.0 (Materialise, Belgium) software. Independent sample T-test and *Mann-Whitney* test were used for analyses. **Results:** Mean values for length, width, and area of foramen magnum for males are 33.0mm, 34.5mm, and 862.7mm² and for females are 31.7mm, 33.1mm, and 794.9mm² respectively. Significant differences between males and females were found for all measurements ($p < 0.05$). **Conclusions:** Sexual dimorphism of foramen magnum dimensions were found in Malaysian population. These findings may complement other data in determining the sexes and can serve as reference in defining the anatomic range of foramen magnum which will be valuable in improving diagnosis, classification, and treatment of diseases related to this region.

(POS 8) Prevalence and distribution of developmental dental anomalies in pediatric patients at Rumah Sakit Gigi dan Mulut Universitas Muhammadiyah Yogyakarta and its network

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Introduction: Tooth abnormality is a deviation from the normal shape and structure of the teeth due to interference during the growth and development of the teeth. There are various kinds of abnormalities of the teeth, such as abnormalities in the size, shape, position, number and structure of the teeth which can cause problems in the arch length and occlusion of the maxilla and lower jaw. **Objectives:** The purpose of this study was to determine the prevalence and distribution of dental abnormalities in pediatric patients at the RSGM UMY and its networks. **Methods:** This study consisted 10,714 medical records of patients aged 0 - 18 year-old who visited the RSGM UMY from 2013 – 2018, and medical records of RSGM UMY network's patients from 2017 - 2018. Analysis of data used in this study was frequency distribution. **Results:** The prevalence of developmental dental anomalies in pediatric patients at RSGM UMY and its network is 0.32%. The prevalence of mesiodens was 0.14%, prevalence of hypodontia was 0.056%, prevalence of fusion was 0.028%, prevalence of microdontia tooth abnormalities was 0.019%, prevalence of peg teeth 0.019%, prevalence of amelogenesis imperfecta was 0.019%, prevalence of taurodontic tooth 0.009%, the prevalence of gemination 0.009%. **Conclusion:** The prevalence of dental developmental abnormalities are low, with mesiodens dental abnormalities being the highest prevalence of dental abnormalities. Tooth abnormalities in this study were more commonly found in male pediatric patients.

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(POS 9) Association between impacted maxillary canines and the morphology of the nasal cavity and maxillary arch in orthodontic patients

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Objective: The aim of this study was to examine the association between impacted maxillary canines and morphology of the nasal cavity and maxillary arch in orthodontic patients. **Methods:** Pre-treatment records of 30 patients with impacted maxillary canines were collected. Nasal cavity width, nasal height and nose shape were measured and compared directly from OPG and lateral cephalometric radiographs respectively. Nasal index was calculated as Nasal width/Nasal height \times 100. Maxillary arch dimension (intermolar width (IMW), arch length (AL), and palatal vault depth (PVD)) were measured (in mm) directly using digital calliper from diagnostic models. AL/IMW \times 100 represents maxillary arch shapes while PVD/IMW \times 100 represents shape of palates. Type of maxillary arch form was classified following arch form template (3M archform). Descriptive statistic and correlation test were used for data analysis. P-value was set at 0.05. **Results:** Results showed the nasal cavity width was 30.21 \pm 5.35; nasal height (52.80 \pm 5.91) and nasal index (57.72 \pm 11.13) showing leptorrhine category. The nose shape consists of 66.7% button type. There was no significant correlation between nose shape and nasal cavity width, $r=0.093$ ($p=0.625$). The shape of maxillary arch was 80.44 \pm 7.37 and the shape of the palate was 33.73 \pm 5.75. Maxillary arch form consists of 40.0% ovoid form. There was no significant correlation between the arch form and the maxillary arch shapes, $r=-0.165$ ($p=0.382$). However, significant correlation between the maxillary arch form and shape of the palate, $r=-0.411$ ($p=0.024$). **Conclusion:** There is negative association between occurrence of impacted maxillary canines with morphology of nasal cavity but positive association between the palatal vault shapes.

(POS 10) Dental anxiety and fear in 13-year-old schoolchildren and its relation to prevalence of dental caries

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Introduction: Studies have shown that children with high caries were reported to be more dentally-fearful than those without any past carious teeth. **Objectives:** To determine and associate dental anxiety and fear (DAF) and caries prevalence among the 13-year-old schoolchildren. **Methods:** A cross sectional study was conducted on 196 13-year-old schoolchildren from a secondary school in Kota Bharu, Kelantan. A validated Malay version of the dental anxiety and fear (IDAF4C+) questionnaires comprising three modules (IDAF-4C, IDAF-P and IDAF-S) were self-administered. Sociodemographic profiles were obtained and caries prevalence was determined by using Decayed, Missing and Filled Teeth Index (DMFT). Data entry and analysis was done using SPSS version 22. Descriptive and chi-square test analysis was done with significant level set at $p<0.05$. **Results:** The response rate was 91.6%. All were Malay and mostly boys (54.6%). The mean score of each item of IDAF-4C was 2.24 (SD=0.76). Having treatment under the unsympathetic or unkind dentist was reported the most anxiety-eliciting by the schoolchildren (mean =3.89, SD=1.38). The prevalence of DAF was 19.9% (95%CI: 14.3%, 25.5%) and dental caries was 48.0% (95%CI: 40.9%, 55.0%). The percentage of students with untreated caries, missing and filled teeth were 23%, 2.6% and 39.3%. There was no significant association between DAF and caries prevalence; $p=0.411$. **Conclusion:** The prevalence of DAF and dental caries was high. However, the association was not significant. Therefore, to improve oral health status, besides DAF, other etiological factors also need to be considered as well to avoid progression of DAF into adulthood among the schoolchildren.

(POS 11) Oral care in cancer patients undergoing chemotherapy and radiotherapy: Nurses' knowledge, attitude and practice

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Introduction: Cancer patients undergoing chemotherapy and radiotherapy to head and neck region are prone to develop oral complications. Nurses can help patients maintain oral hygiene in order to prevent oral complications and reduce debilitating effects on patients. **Objectives:** This study aims to determine knowledge, attitude and practice of oncology nurses towards oral care of cancer patients undergoing chemotherapy and radiotherapy. **Methods:** In this cross-sectional study, data were collected from 61 oncology nurses of Hospital Universiti Sains Malaysia (USM) using a self-administered questionnaire. **Results:** Most nurses knew that cancer patients undergoing chemotherapy and radiotherapy to the head and neck region are at risk for oral complications (83.6%) and daily oral hygiene should never be suspended even when the patient have complications (95.1%). However, only less than half of nurses knew high-dose radiation to the head and neck can permanently alter salivary functioning (41.0%) and increase patients' risk for osteonecrosis (34.4%). All nurses agreed regular oral care should be done on patients and they need more information on oral care standards. Most nurses reported providing oral care at least twice daily using various methods and the most common oral care product used for mouth swab and mouthwash was chlorhexidine gluconate, and the most common lip moisturiser was petroleum jelly. **Conclusion:** The nurses' attitude towards oral care was generally positive and most oral care methods and products were appropriate. However, some nurses had limited knowledge about oral side effects of cancer treatment. An oral care protocol for patients with cancer is recommended.

(POS 12) Daytime sleepiness and sleep quality among Universiti Sains Malaysia dental students

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Introduction: Poor academic performance was reported to be associated with poor sleep quality and daytime sleepiness among university students. **Objectives:** To determine the prevalence and factors of excessive daytime sleepiness and poor sleep quality among dental students in Universiti Sains Malaysia (USM). **Methods:** A cross-sectional study was done among dental students in USM. Validated Sleep Quality Index (PSQI) was used to determine the daytime sleepiness and Epworth Sleepiness Scale (ESS) questionnaire was used to assess the sleep quality. Data were analysed with SPSS version 24.0. Chi-square analysis and independent t-test were used to determine factors associated with excessive daytime sleepiness and poor sleep quality. Significant value was set at $p < 0.05$. **Results:** A total of 237 respondents answered the questionnaire with response rate was 98.3%. Most of the respondents were Malay (54.8%) and female (67.6%). The prevalence of poor sleep quality and excessive daytime sleepiness was 68.5% and 34% respectively. Chi-square analysis found no significant association between sex and physical activity with poor sleep quality. However, independent t-test showed that participants with good sleep quality significantly had longer sleep duration per night compared to those with poor sleep quality with mean difference of 1.16 hours ($p = 0.000$). **Conclusion:** The prevalence of poor sleep quality among USM dental students were relatively high. The study found no significant association between poor sleep quality and daytime sleepiness, but the study showed sleep duration per night was significantly associated with sleep quality.

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(POS 13) A comparison of stress levels among disciplines and their adverse effects on physical health among undergraduate dental students of School Of Dental Sciences, USM

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Introduction: Dental students are likely to experience stress which in turn affect physical health. **Objectives:** This research is aimed to compare stress levels among different disciplines for each academic year and their adverse effects of Universiti Sains Malaysia (USM) undergraduate dental students. **Methods:** A cross sectional study was conducted among 225 students in Year 1, 2, 3, 4 and 5 of academic session 2017/2018 in School of Dental Sciences, USM. The respondents were given URL link of online questionnaires of validated modified Dental Environment Stress (DES) and their response were analysed. **Results:** Oral Biology has the highest mean (SD) score of stress level in Year 1, 3.17 (0.55). Human Biology II has the highest mean (SD) score of stress level in Year 2, 2.75 (0.58). Prosthodontics, Oral Medicine Oral Pathology and Paediatric have the highest mean (SD) score of stress level in Year 3 (3.03 (0.34)), Year 4 (3.50 (0.47)) and Year 5, (3.42 (0.49)) respectively. In comparison of mean score stress level of disciplines between clinical years which are Year 3, 4 and 5, there are significant differences in Periodontics, Paediatric and DPH. In terms of adverse effects of stress, feeling tired during the day has the highest percentage for every academic year which are Year 1 (91.8%), Year 2 (85.4%), Year 3 (82.7), Year 4 (85.7%) and Year 5 (80.5%). **Conclusion:** Every academic year has different most stressful discipline. Stressors need to be identified and managed by school to reduce students' stress levels.

(POS 14) A seven-year retrospective study of oral cancer in Hospital Universiti Sains Malaysia (USM) Kelantan

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Introduction: The mortality rate of oral cancer in Malaysia is high compared to other countries. Oral cancer cases at Hospital USM usually presented at advanced stages. **Objectives:** This retrospective study was conducted to determine the prevalence, age, gender, ethnicity, the site of lesion, risk factors, histopathological differentiation, TNM stage and mortality of the oral cancer in Hospital USM from 1st January 2011 to 31st December 2017. **Methods:** The medical records of oral cancer patients were studied and SPSS version 24.0 was used to analyze the results obtained. **Results:** A total of 117 patients were diagnosed to have oral cancer, 67 (57.3%) in male and 50 (42.7%) in female with the mean age was 56.25(SD15.59). Malay population with 100 (85.5%) cases were the most affected. The most frequent site involved is tongue (54.7%) followed by salivary gland (12.0%). High risk factor in male was smoking (39.3%) while female was betel nut chewing (10.3%). Oral cancer at floor of mouth showed highest mortality rate (66.7%). 41 (40.2%) cases at advanced stages were high in mortality compared to localized stages cancer which only constituted 2 (13.3%) cases. **Conclusion:** Oral cancer in Hospital USM occurred mainly in Malay males and elderly patients in the age group above 60 years old. There is significant association between stages of cancer and mortality ($p=0.044$). Patients presented with advanced stages (stage III and IV) have higher risk of mortality.

(POS 15) Fluoride content in adult's toothpaste marketed in Indonesia

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Introduction: The use of fluoride toothpastes has been extensively documented since it plays a pivotal role in the prevention and control of dental caries. Manufacturers, perhaps driven by consumer demand, have introduced several purposes of toothpaste. To deliver these benefits, some formulations have to be optimised, whilst manufacturers perhaps sometimes unaware of the effect on fluoride delivery. In Indonesia, no information is available regarding the fluoride ion content in adult's toothpastes. **Objectives:** To enumerate the content of total fluoride available in toothpastes commercialised for adult in Indonesia considering its anti-caries potential, to analyse the country guidelines for their use, and to discuss the recommendations for fluoride toothpastes intended for adult, based on the best available evidence. **Methods:** This research is an analytical laboratory study, *in vitro* analysis of total fluoride (TF) in 10 adult's toothpastes randomly purchased in triplicate, each of them from different stores, and assessed using ion selective electrode. **Results:** The available fluoride content in adult's toothpastes found in our analysis did not match the fluoride content provided on the packaging of all samples. Five (5) out of 10 toothpastes contain fluoride less than 1000 ppm F while the other 4 contain fluoride greater than 1500 ppm F. Only one toothpaste contains fluoride which match both standard from evidence based dentistry and Indonesian regulation. **Conclusion:** Most adult's toothpastes marketed in Indonesia do not present available fluoride concentration for caries control.

(POS 16) Oral health impact profile among different type of removable partial dentures wearers

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Introduction: Various types of removable dentures have been fabricated for patients by undergraduate dental students in USM each year. However, the functional and psychosocial impacts of these prostheses were unknown and have not been evaluated till date. **Objectives:** To determine and compare the oral health impact profiles among different types of partial denture wearers. **Methods:** A total of fifty-seven removable partial denture patients from 2015 to 2017 were retrieved from the database following the selection criteria. They were divided into the type of dentures issued which are Group 1: Cobalt chrome (n=19), Group 2: Acrylic (n=19) and Group 3: Flexible dentures (n=19). The subjects consented and completed the Oral Health Impact Profile-14 (OHIP-14) questionnaire in Malay version. Secondary data (age, sex, duration of edentulism, denture age and partial denture classification) was also recorded. The data was analysed using IBM SPSS version 20 with the level of significance at 0.05. Kruskal Wallis test was used to evaluate the difference between groups. **Result:** The functional domains are mostly affected while the psychosocial and pain domains was unaffected or minimally affected by their dentures. 54.4% of the patients claimed to have "chewing difficulties". Almost similarly, "discomfort in eating any food" and "prevented eating certain food" were reported in 61.4% and 66.7% of patients respectively. "Problems with food sticking to the dentures" were reported in 77.2% patients with the mean score close to "Occasionally" (2.12±1.48). No significant difference on the oral health profile observed between the three types of dentures. **Conclusions:** All types of partial dentures give same impact to the patients' oral health with high in functional impact.

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(POS 17) Behaviour management techniques in managing paediatric patients: A survey of general dental practitioner in Kota Bharu

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Introduction: A general dentist practitioner should have sound knowledge to diagnose oral disease and provide the necessary treatment. In managing paediatric patients, it is of utmost importance for the dentist to have good behaviour management skills to promote positive behaviour towards dental treatment and oral health, generally. **Objectives:** The present study was conducted to determine the use of behaviour management techniques among general dental practitioner in Kota Bharu, Kelantan. **Methods:** A cross-sectional study was conducted to determine the use of behaviour management techniques among general dental practitioner in Kota Bharu. Fifty six respondents from 49 dental clinics participated in this study. A validated self-constructed questionnaire comprised of 20 closed-ended questions was distributed and the data was analysed for frequency, percentage, mean and standard deviation by using IBM SPSS Statistics version 22.0. **Results:** The results showed that almost half dental practitioners (46.4%) always took the responsibility to manage paediatric patients. Near all of the respondent (94.6%) did not use nitrous oxide inhalation sedation in treating children patients and three-quarter of them would occasionally prefer general anaesthesia. Majority of the dentist (78.6%) did not practice hand-over-mouth technique and they always praised (76.8%) their child patient when positive behaviour was exhibited. **Conclusion:** In conclusion, most of the general dental practitioner in Kota Bharu, Kelantan applied behaviour management techniques when managing their paediatric patients in the dental clinics.

(POS 18) Diametral tensile strength, water sorption and solubility analyses of experimental zirconia reinforced nanohybrid dental composite from rice husk

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Introduction: School of Dental Sciences, USM is developing a zirconia reinforced nanohybrid dental composite using silica purified from rice husk as filler. **Objectives:** To analyse the effects of zirconia reinforcement on the dental composite diametral tensile strength (DTS), water sorption (WSop) and solubility (WSol). **Methods:** Ten cylindrical specimens (6 mm diameter x 3 mm height) were prepared for each group for the DTS. Seven groups with different percentage of zirconia reinforcement, and different mixing method were prepared: Negative control (0 wt %), Mixing IA (3 wt %), Mixing IB (5 wt %), Mixing IIA (3 wt %), Mixing IIB (5 wt %), Mixing III (5 wt%) and Positive control (Filtek Z250; 3M ESPE). DTS was measured with a universal testing machine. Specimens were immersed into distilled water and coke for WSop and WSol. They were weighed using digital balance at suitable time intervals. One-way ANOVA and post-hoc Tukey's test were used for analysis. **Results:** A pattern of increased DTS was seen with the increment of zirconia reinforcement. The increased DTS were found to be statistically not significant ($p > 0.05$), except for Mixing IIB and Mixing III ($p < 0.05$). No significant differences of WSop were observed between groups for both media ($p > 0.05$). There were significant differences of WSol ($p < 0.05$). Mixing III presented the lowest water solubility in both media. **Conclusion:** The data may suggest that zirconia reinforcements (3 wt % and 5 wt %) increase the diametral tensile strength of this experimental nanohybrid dental composite. Water solubility was lower for the nanofill than microfill resin.

(POS 19) The role of continuous moderate exercise on hsp70 expression and the number of transform cell on oral squamous cell of *Mus musculus*

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Introduction: Cancer is a serious problem and shows increasing prevalence in the world. In Indonesia, 1.4% out of 1000 people have cancer. Cancer is mainly caused by genetics and environmental factors. Benzopyrene, a carcinogen that is found in cigarettes, causes DNA mutation and formation of transform cells. One regulation in the body to repair DNA mutation is through 70 kilodalton heatshock protein (Hsp70), while exercise is known to reduce the risk of cancer because it decreases blood glucose and fatty acid level. **Objectives:** To prove the role of continuous moderate exercise on Hsp70 expression and the number of transform cell on oral squamous cell of *Mus musculus*. **Methods:** This study used a true experimental with randomised block design. The *Mus musculus* were divided into three groups: control group-1 (K1), not given any physical exercise and benzopyrene, control group-2 (K2), not given any physical exercise but induced with 0.08 mg benzopyrene, and treatment group (P), given moderate intensity physical exercise and induced with 0.08 mg benzopyrene. Buccal mucosa tissue samples were taken and stained for immunohistochemistry. Hsp 70 expression data was analysed by Kruskal Wallis test, and transform cell data was analysed with Brown-Forsythe test. **Results:** There was no difference among the three groups on Hsp70 expression ($p=0.874$), but there were significant differences among the three groups on the number of transform cell ($p=0.000$). **Conclusion:** Continuous moderate exercise has no effect on Hsp70 expression, but could decreased the number of transform cell on oral squamous cell of *Mus musculus*.

(POS 20) Effectiveness of cabe jawa (*Piper retrofractum* Vahl) extract on the healing of recurrent aftosa stomatitis (RAS) in *Rattus norvegicus*

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Introduction: Recurrent aftosa stomatitis (RAS) is a recurrent oral ulcer with multifactorial causes. The RAS prevalence worldwide is 5-66% with an average of 20%. An oral ulcer that is taken care using mouthwash containing alcohol and corticosteroids has some side effects, i.e. increasing the growth of *Candida sp.* in the oral cavity and developing oral cavity cancer. **Objectives:** To determine the effectiveness of cabe jawa extract (*Piper retrofractum* Vahl) on the wound healing process of recurrent aftosa stomatitis. **Methods:** It was an experimental study, the samples were 24 male *Wistar* rats, weighted 180-200 grams, aged 20 weeks, divided into 4 intervention groups, i.e. G1 of untreated RAS wounded rats, G2 of RAS wounded rats treated with iodine, G3 of RAS wounded rats treated with extracts of cabe jawa gel 50%, and G4 of rats treated with extracts of cabe jawa gel 100%. **Results:** All groups experienced a decrease in leukocyte count except in the negative control group (G1). The highest decrease occurred in treatment group 4 (G4) (100% concentration) of 29.75%, and the lowest in the positive control group (iodine; G2) of 6.61%, while in the negative control group (G1), an increase in leukocyte counts of 79.32% was observed. Therefore, it was known that *Piper retrofractum* Vahl extract decreased the leukocytes number in RAS rats. **Conclusion:** The application of cabe jawa extract with 100% concentration is more effective than 50% concentration and control groups in decreasing the leukocyte score in injured rats.