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STUDENTS SCIENTIFIC CONFERENCE

18th STUDENTS SCIENTIFIC CONFERENCE

A Virtual Asynchronous Event



08 APRIL 2021 (THURSDAY)



ABSTRACT BOOK



18th STUDENTS SCIENTIFIC CONFERENCE – A VIRTUAL ASYNCHRONOUS EVENT
THURSDAY, 8th APRIL 2021

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EROSION ON GLASS IONOMER CEMENT AND THEIR ADDITION: A REVIEW

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Introduction: Glass ionomer cement (GIC) is a type of tooth coloured dental restorative materials which is commonly used in today's aesthetic world. This intra-oral restorative material is commonly exposed to the intrinsic and extrinsic erosive environment which affects the integrity of the restoration and eventually affects daily living. Over the years, many modifications have been done to improve the properties of conventional GIC (cGIC) while maintaining its clinical advantages. Various studies have been conducted to compare the effects of erosion on cGIC and modified GIC.

Objectives: This literature review aims to analyse the effect of erosion on cGIC, resin modified GIC (RMGIC) and their modifications.

Methods: Literature search was performed using PubMed, Scopus and Web of Science databases to identify the related articles that are within the research interest using multiple keywords combinations. Searches were limited to articles that were published from year 1990 to 2019. Sixty-six articles that fit the research interest and address the research questions were selected.

Results: Conventional GIC had been greatly affected when exposed to low pH solutions that contain hydrochloric, phosphoric and citric acid. It showed greater mean of surface microhardness loss, increase solubility and microleakage as compared to RMGIC that was modified with resin. Limited study was found for erosion on other modification where CPP-ACP addition showed no changes.

Conclusion: Conventional GIC generally was highly affected by erosion which is lesser by modification with resin in RMGIC and no changes with CPP-ACP inclusion.

Keywords: acid challenges, erosion, glass ionomer cement, GIC modifications, resin modified GIC

**DOES URETHANE DIMETHACRYLATE, UDMA IMPROVES THE PROPERTIES OF
DENTAL BASED COMPOSITE RESIN?**

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Introduction: Traditionally, resins used in composite resin are mixture of Bis-GMA and TEGDMA only. Nowadays, additions of new resin specifically, UDMA became increasingly common, due to this monomer's low viscosity and high flexibility in relation to Bis-GMA.

Objectives: The study was conducted to review on incorporation of Urethane Dimethacrylate, UDMA as a resin-based composite by evaluating the mechanical properties of flexural strength and hardness.

Methods: This review were based on the literature retrieved from PubMed, Medline, Web of Science, Scopus, and other reliable scientific database. Keywords used were composite resin, UDMA, flexural strength, hardness. 21 relevant articles were collected.

Results: The findings were incorporation of UDMA shows higher flexural strength compared to other monomers used in dental composite such as Bis-GMA, TEDGMA and Bis-EMA. Plus, the mixture of Bis-GMA, UDMA and TEDGMA in ratio of 40:20:40 eventually show higher flexural strength than UDMA alone as monomer used in dental composite. Other than that, UDMA also appear to have higher elastic modulus than other monomers in dental composite. As for hardness, incorporations of UDMA in composite resin containing Bis-GMA and TEDGMA increases the hardness of the dental composite too.

Conclusions: The incorporation of UDMA in resin composite improves the mechanical properties of dental based resin composite.

Keywords: *Urethane Dimethacrylate* (UDMA), resin monomers, composite resin, mechanical properties

**PERCOLATION OF PLASTIC CHEMICALS INTO FOOD/FOOD STIMULANT:
A REVIEW**

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Introduction: In this current rapid-developing-busy world, drive-thru and take away are the best option to ease work load of human being. Although those food are time and energy saving, the percolation of plastic chemicals into food products documented to threatening humans health cannot be neglected. Hence, this research acts an initial study to find relation between toxic effects percolating from plastic food packaging into food stimulants with oral cancer.

Objectives: To conduct a review writing on presence of percolated plastic chemicals from plastic food packaging into food/food stimulants.

Methods: This study aims at reviewing published articles pertaining to percolation of plastic packaging into food / food stimulant in two categories which are monomer and plasticizer that are retrieved from computerized database of a reliable sources which are Science Direct and Pubmed.

Results: Based on the review articles, styrene monomer accounts for the most published chemicals migration into food/food stimulant where migration of styrene is highly detected in recycled expanded polystyrene with lowest temperature detected is at 4°C. Vinyl Chloride shows contrasting result where no migration detected in solid food but presented in liquid food. Plasticizer on the other hand manifest a vast chemicals migration into solid and liquid food with variables factor such as time, temperature and radiation.

Conclusions: It is scientifically proved that plastic chemicals from food packaging could percolates into food in regards of higher temperature and time taken. Further studies required to find association between them and oral cancer.

Keywords: Plastic food packaging, plastic chemicals percolation, food stimulant, plasticizer migration, monomer migration

BOND STRENGTH OF NANOCOMPOSITE TO BIODENTINE: A SYSTEMATIC REVIEW

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Introduction: This systematic review intended to study the bond strength of nanocomposite to Biodentine.

Objective: To evaluate whether resin composite can be used directly over Biodentine when used as pulp capping material.

Materials and Methods: A computerized literature search was performed in PubMed for articles published from January 2013 to December 2019. Quality assessment of the selected articles was carried out according to the PRISMA guidelines, 2009.

Results: A total of 11 *in vitro* studies were included in this review. Of these, 9 studies were shear bond strength of nanocomposite to Biodentine while only 2 articles were about microshear bond strength of nanocomposite to Biodentine. With regards to adhesive systems, 4 studies using universal adhesive systems showed comparable results while another 4 articles using total-etch and etch-and-rinse adhesive systems showed better result in bond strength however with comparable results with another 3 studies using self-etch adhesive systems.

Conclusion: It may be concluded that bond strength of nanocomposite to Biodentine is associated with types of adhesive systems used and the types of composite resin used be it nano-filled, nanohybrid or bulk-filled composite resin, composite material may be preferable for definitive filling after pulp capping with Biodentine.

Keywords: Bond strength, nanocomposite, *in vitro* studies, Biodentine

COMPARISON OF PATH MODEL AND MULTIPLE LINEAR REGRESSION (MLR) MODEL IN DETERMINING THE RISK FACTORS OF TYPE 2 DIABETES MELLITUS

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Introduction: Type 2 diabetes mellitus (DM) is the most common form of diabetes. Data released by the International Diabetes Federation (IDF) shows that Malaysia is one of the worst affected countries in Asia. Therefore, it is essential to identify all the risk factors of type 2 diabetes mellitus to help in early detection and reduce the risk of the disease.

Objectives: This study aimed to determine which methods are more effective in determining the risk factors of type 2 diabetes mellitus by comparing both path and linear regression models. The risk factors involved were Body mass index (BMI), HDL cholesterol, Incident CHD, Hypertension status, Systolic blood pressure, Triglycerides, Weight (lbs) and Age.

Methods: Secondary data of type 2 diabetes mellitus patients was analysed using IBM SPSS Statistics 24 through path analysis and multiple linear regression methods. The risk factors of type 2 diabetes mellitus were determined based on their significant to type 2 diabetes mellitus either direct or indirectly. Lastly, the comparisons between two models were made and the most effective methods were determined based on the results.

Results: Based on the regression model, all risk factors are not significant to type 2 diabetes mellitus, however in the path model, only age, weight and systolic blood pressure are not significant to the type 2 diabetes mellitus.

Conclusion: Path analysis method is more effective than multiple linear regression method in determining the risk factors of type 2 diabetes mellitus.

Keywords: Path Analysis Model, Multiple Linear Regression Model, Type 2 Diabetes Mellitus

ASSESSING THE EFFECTIVENESS OF GAMIFIED BIOCHEMISTRY MODULE FOR UNDERGRADUATE DENTAL STUDENTS IN UNIVERSITI SAINS MALAYSIA

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Introduction: Gamified learning activities in higher education has gained significant interest in recent years. Despite less evidence on the effectiveness, gamification of basic science subjects is suggested to benefit both educators and students as opposed to the conventional learning method.

Objectives: This study aims to investigate students' perception towards gamification of biochemistry module, as well as to evaluate student's engagement, and to identify potential issues in achieving the learning outcome from the gamified session.

Methods: This cross-sectional study was conducted between January to December 2020, involving 52 dental undergraduates in School of Dental Sciences, Universiti Sains Malaysia. The self-administered online questionnaires were distributed after the gamified biochemistry session.

Results: Respondents demonstrated positive responses toward gamified lessons. Students perceive gamification to improve understanding on topics (86.5%) and ease the learning process (84.6%). Gamified learning experiences encourage students to participate in discussion (92.3%) and further stimulate their learning capacity (90.4%) via appropriate variety of methods used (90.4%). A significant association was recorded between an effectively designed module and stimulation of learning environment (p -value=0.008). A relatively good score of 72.0% in metabolism-related topic was recorded in the final examination, which reflected the effectiveness of gamified biochemistry module. The present study also identified few issues to be addressed in future curriculum delivery.

Conclusion: The students view gamification as having a positive effect on their learning progress and interpersonal skills. Gamified modules were proven effective in delivering the course content and possess huge potential for applications in higher education.

Key Words: Gamification, Biochemistry, Higher Education, Attitude, Perceptions

MICROWAVING FOOD IN PLASTIC: A REVIEW ON CHEMICAL MIGRATION FROM PACKAGING INTO FOOD AND ITS EFFECTS

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Introduction: Our takeaway containers are commonly made of polypropylene (PP) and polyethylene terephthalate (PET) to preserve our food over some time. When we reach home, we can always reheat our food in a microwave oven as if they are just freshly prepared. However, heating plastic under the microwave can promote hazardous chemical migration, which may threaten our health.

Objectives: To conduct a review writing on the chemical migration from plastic packaging into food upon microwave heating and its effects.

Methods: Electronic databases such as ScienceDirect and PubMed were searched with the terms “microwave heating”, “plastic packaging food”, “plastic chemical migration”, “health risks” and “diseases”. Only papers published from 2011 to 2020 were selected, and the most relevant references were chosen.

Results: Possible migrating chemicals include plasticizers, antioxidants, volatile compounds, photoinitiators and monomers. All the review studies revealed an increase in the migration rate of these chemicals upon microwave heating. The migration can be affected by other parameters, including packaging materials, the food content, the microwave power, the heating time and temperature. Prolonged used containers possess small deformation, which makes them more susceptible to chemical migration. Of all these migrants, some of them were found to be hazardous to our health upon consumption. Phthalates and Bisphenol A (BPA) are the two well-known endocrine-disrupting chemicals (EDC).

Conclusion: Further studies are warranted to evaluate the toxic effects of human exposure to these migrants, especially involving the locally available plastic packaging materials in Malaysia.

Keywords: plastic migration, food packaging, microwave heating, endocrine-disrupting chemicals

ANTIBACTERIAL PROPERTY OF VIRGIN COCONUT OIL (VCO) AGAINST STREPTOCOCCUS MUTANS

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Introduction: Virgin coconut oil (VCO) is gaining popularity throughout the world due to its anti-inflammatory and anti-oxidant properties including increases antioxidant enzymes, reduces inflammation and degeneration of brain, normalizes inflammasome, oxidative stress and brain histological changes. To date, there are limited studies on the effectiveness of VCO in inhibiting activity of *Streptococcus mutans*, the major pathogen of dental caries.

Objectives: To evaluate the antibacterial effect of Virgin Coconut Oil against *Streptococcus mutans*.

Methods: This is an *in vitro* experimental study where the antibacterial effect of VCO (Nutrell, UTM, MALAYSIA) was evaluated by agar diffusion, minimum inhibitory concentration (MIC) and minimum bactericidal concentration (MBC) methods. *Streptococcus mutans* (ATCC 35668) was tested with VCO with concentration of 3.125%, 6.25%, 12.5% and 25% respectively. Antibacterial activity was evaluated by measuring zones of inhibition in millimeter using digital caliper (Mitaka, Japan). The test was done in triplicates.

Results: There was inhibition of *Streptococcus mutans* activity at the VCO concentration of 12.5% and 25% by agar-well diffusion method. However, the MIC and MBC tests did not show any antibacterial activity of VCO against *Streptococcus mutans*.

Conclusion: VCO exhibited antibacterial effect against *Streptococcus mutans*.

Keywords: Cariology, *Streptococcus mutans*, Virgin coconut oil

ACMELLA ULIGINOSA: FROM TROPICS INTO ANESTHETIC AND COSMETIC

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Introduction: This review is about the origin, cultivation, chemical composition, extraction, utilization of spilanthol from *Acmella uliginosa* (Subang nenek) extract. The review was based on the literature search and also derived from the authors' experience in cultivating and extracting the bioactive compound spilanthol from the plant.

Objectives: This review writing is conducted to review about *Acmella uliginosa* which has steadily making its way from traditional remedy for toothache into local anesthetic and premium cosmetic products. Spilanthol, which is a bioactive compound in it, soothes and calms the skin as well as smoothes and softens the wrinkles.

Methods: Literature search also was performed using Google Scholar databases to identify the related articles that are within the research interest using multiple keywords combinations. Originally from wild, it is commonly used by the Malay community in Malaysia to relieve pain associated with mouth ulcers, toothache, sore throat, and stomach ache.

Conclusion: For the conclusion, *Acmella uliginosa* is making its way into analgesics and cosmetics; with the latter application is much widespread.

Keywords: Acmella uliginosa; cultivation; extraction; spilanthol; analgesics; cosmetic

ORAL HEALTH EFFECT OF HIGH DOSE VITAMIN C IN THE TREATMENT OF COVID-19 INFECTION: A REVIEW

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Introduction: Vitamin C play role in human metabolism as well as the production of various materials in pharmaceutical. During the novel coronavirus outbreak, vitamin C has been used in preventing or therapeutic agent for the critical phase of cononavirus-19 (COVID-19). There is clear evidence that vitamin C in high doses can reduce interleukin-6 and endothelin-1 mediators in many patients with severe COVID-19. Considering that vitamin C is cheap and safe, using a relatively low to high dose of vitamin C as prophylaxis among community have increased. However, previous report describes of consuming vitamin C on a frequent basis leading to marked tooth surface loss.

Objectives: The review aims to investigate and discusses the effect of vitamin C on oral health in the treatment and prevention of COVID-19 infection.

Methods: Literature search was performed using various databases such as Google Scholar, NCBI, PubMed and Cochrane with multiple keywords within the interest of this research. Data collected from previous articles were limited to articles that were published in English.

Results: The effect of usage of high dose vitamin C is significantly advantageous in patients with severe COVID-19 infection. High consumption of vitamin C on a frequent basis as preventive or therapeutic agent may lead to marked tooth surface loss. This illustrates on how dental erosion if not controlled, can lead to potentially harmful effects on both the dentition and stomatognathic system.

Conclusion: High dose vitamin C is a preventive or therapeutic agent for COVID-19 but can cause negative effect on oral health.

Keywords: Ascorbic acid, COVID-19, vitamin C, oral health

PROPOLIS: BEE PRODUCT THAT HEALS THE BONE – A NARRATIVE REVIEW

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Introduction: Propolis is the natural resinous mixture produced by honeybees from substances collected from parts of plants, buds, and exudates. It contains antioxidants such as flavonoid and phenolic acid that is important for bone healing. The potential bone healing properties of propolis may have clinical significance in various branches of dentistry, including periodontology, orthodontics as well as oral and maxillofacial surgery.

Objectives: To evaluate the current state of studies investigating the effects of propolis in bone healing.

Methods: A literature search of the databases PubMed, Cochrane Library, Scopus and Google Scholar was performed from the last two decades until July 2020 with the keywords “propolis AND bone AND alveolar bone AND healing”.

Results: A total of 19 articles were identified and evaluated, which comprised 16 animal and 3 *in vitro* cell culture studies. The animal studies revealed that propolis might reduce the periodontitis-related alveolar bone loss, increase the bone mineral content and density, increase the antioxidant enzymes, increase the number of osteoblasts and decrease the number of osteoclasts. This is supported by cell culture studies which showed that propolis might increase *in vitro* bone formation and inhibit osteoclastogenesis.

Conclusion: The literature shows that propolis has beneficial effects in reducing bone loss, accelerating bone formation and maturation which could be due to its antioxidant properties. Therefore, the use of propolis can be an effective and economical approach in managing bone defects.

Keywords: propolis, bone, alveolar bone and healing

**CHEMOPREVENTION OF NATURAL PRODUCTS AGAINST ORAL CANCER – A
COMPREHENSIVE REVIEW**

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Introduction: Cancer chemoprevention involve the use of specific compounds to suppress the growth of tumours or inhibit the carcinogenesis which comprise synthetic drugs and natural products. Natural products have been known as one of the most significant resources of anticancer agents.

Objectives: In this review, it aims to recognize the various plants, vegetables, and fruits which have chemotherapeutic agents that can be used to inhibit the cell proliferation and induce apoptosis of oral cancer cell.

Methods: Literature search was performed using Google Scholar and National Center for Biotechnology Information databases to select the related articles that are within the research interest using multiple keywords combinations.

Results: Most of the natural products exhibit potential cytotoxicity and caused the induction of a broad spectrum of oral cancers.

Conclusion: The discovery of natural product as alternative treatment of oral cancer has been developed since the products are important for reduction of side effect, high selectivity, low toxicity, and better killing of cancer cells.

Keywords: cancer chemoprevention, natural products, plants, vegetables, fruits and oral cancer.

EFFECTS OF INTRACANAL MEDICAMENTS ON PUSH-OUT BOND STRENGTH OF ENDODONTIC SEALERS: A SYSTEMATIC REVIEW

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Introduction: Intracanal medicament can be defined as temporary placement of medicaments with good biocompatibility into root canals for the purpose of inhibiting coronal invasion of bacteria. It can affect dentin with consequent impacts on the bond strength due to the changes it caused in the structure of root dentin.

Objectives: To write a systematic review that compare the effect of different intracanal medicaments on push-out bond strength of endodontic sealers

Methods: An electronic search was performed in PubMed, SCOPUS, and Web of Science from January 2010 to June 2020 for the relevant studies. A total of 508 studies were retrieved. After applying the exclusion and inclusion criteria, a total of 20 studies were included in the review. The meta-analyses calculated the pooled mean differences between calcium hydroxide and the control. Heterogeneity was evaluated and fixed-effects or random-effect model were used as appropriate. The analyses were conducted using Review Manager V5.3 software program for windows. The significance level was set at P-value < 0.05.

Results: All studies used calcium hydroxide with or without one or more other medicaments. There were 7 studies used resin-based endodontic sealers, 8 studies used calcium silicate-based endodontic sealer, while 5 studies used luting cements. The push-out bond strength of the tested endodontic sealers was not significantly affected by the intracanal medicaments used. The meta-analysis of the calcium hydroxide similarly revealed no significant effect on push-out bond strength of the different sealers and cements.

Conclusion: This systematic review concludes that intracanal medicaments did not affect the bond strength of different endodontic sealers.

Keywords: intracanal medicaments, luting cements, push-out bond strength

ASSOCIATION OF SERUM CALCIUM AND PHOSPHATE IN CONGENITAL HEART DISEASE WITH DENTAL CARIES IN PAEDIATRIC PATIENTS

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Introduction: Dental caries is a transmissible bacterial disease caused by acids from bacterial dissolving the mineral. Calcium and phosphate reduce the development of dental caries by altering the cariogenic potential of dental plaque biofilm. Congenital heart disease (CHD) patients are prone to develop caries due to the enamel hypoplasia and hypomineralisation of the teeth. Calcium and phosphate levels in CHD with dental caries need to be evaluate for their role in preventing caries in these patients.

Objective: To compare and determine the association of serum calcium and phosphate levels in congenital heart disease with dental caries patients.

Methodology: Seventy-six patients, which consist of 38 CHD with dental caries patients and 38 controls (dental caries patients without CHD) were recruited. Subjects were selected from the records of patients who attended USM dental clinic. The dft index, DMFT index, serum calcium and phosphate results were obtained from the record.

Results: There were no significant difference between mean serum calcium and phosphate in CHD with dental caries (2.27 and 1.56) and controls (2.28 and 1.48) respectively. A significant negative relationship was found between serum calcium and dft index ($p < 0.05$ $r = -0.420$) and serum phosphate and dft index ($p < 0.05$ $r = -0.281$). There were no significant correlations for serum calcium and phosphate with DMFT index ($p > 0.05$).

Conclusion: The mean calcium level in CHD patients with dental caries and controls are both on the lower normal level that suggests higher dental caries in both groups which showed the important of nutritional status for the CHD patients.

Keywords: Congenital heart disease, dental caries, calcium and phosphate

POST TRAUMA SURFACE AREA OF ORBITAL FRACTURE AND ITS INVOLVEMENT OF POSTERIOR LEDGE AND ASSOCIATED ENOPHTHALMOS – NARRATIVE REVIEW

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Introductions: Surface area of orbital fracture is significant in predicting enophthalmos. Enophthalmos usually correlated with orbital floor fracture due to thin anatomical structure. The orbital surface area involvement in the fracture line is one of the imperative aspects. Surface area of the defect contribute to increase in the orbital volume and cause the entrapment of the orbital content that leads to enophthalmos. In the literature review, they stated strong relationship between enophthalmos and surface area but they did not concern about the involvement of posterior ledge in the orbital fracture.

Objectives: To review on the surface area of the orbital fracture in post trauma patients and the involvement posterior ledge and associated enophthalmos.

Methods: Database including Pubmed, Medline, Web of Science and Scopus were used to investigate the topic, with the keywords: enophthalmos, orbital fracture and posterior ledge.

Results: Various study showed that range from 1.1 until 2.75 cm² surface area of orbital fracture can cause enophthalmos mostly combination fracture of orbital floor and medial wall. Previous study also said that 2 mm of enophthalmos required 2.75 cm² of fracture of the wall. One study state that there is involvement of posterior ledge in orbital fracture however it is not significant.

Conclusions: The assessment of surface area of bone defect in orbital fracture to predict the occurrence of post-traumatic enophthalmos is 1.1 to 2.75 cm².

Keywords: Orbital fracture, enophthalmos, posterior ledge

SURVIVAL RATE OF DENTAL IMPLANT PLACED IN HOSPITAL UNIVERSITI SAINS MALAYSIA (HUSM)

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Introduction: Dental implants commonly have been used to replace the missing teeth due to its long term survival. Although the survival rate of dental implants has been well-established, failure can still occur.

Objective: To assess the correlation between diabetes, smoking, PTFE and the survival rate of dental implant.

Methods: This is a cross-sectional study among patients that placed dental implants in Hospital Universiti Sains Malaysia (HUSM). Patients that fulfill the criteria will be called through telephone and will be asked to participate in this study voluntarily.

Results: Out of 135 patients, only 45 were contactable. A total of 108 implants were included in this study. The age range of patients was between 21 to 74 years with the implant were placed within year 2004 to 2016. There were 25 (55.6%) male and 20 (44.4%) female, in that 8 (16.7%) were diabetic patient and 37 (83.3%) were non-diabetic, 5 (11.1%) were smoker and 40 (88.9%) non-smoker, 11 (24.4%) were compliance to post treatment follow-up and 34 (75.6%) were non-compliance. Implant placed more at the posterior compared to anterior. From 108 implants, 105 (97.2%) were survival and 3 (2.8%) of them claimed that the implant were failed.

Conclusion: There is no significant correlation between diabetes, smoking and PTFE and, the survival rate of dental implant.

Keywords: Dental implant, survival, diabetes, smoking, follow-up

**MANAGEMENT OF DENTINE HYPERSENSITIVITY WITH LASER THERAPY AND
FLUORIDE VARNISH: A SCOPING REVIEW**

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Introduction: Dentine hypersensitivity (DH) is a common, transient oral pain condition affecting many individuals. The pain resulted immediately on stimulation of exposed dentine and resolving on stimulus removal. Many materials and techniques are used to treat DH, including specific dentifrices, laser irradiation dentin adhesives, antibacterial agents, resin suspensions, fluoride rinses and fluoride varnishes, dentinal adhesives, periodontal membranes. Although multiple treatments are proposed for DH, there is still no gold standard for the treatment of DH available today.

Objective: To write a review with the aim of evaluating the efficacy between the fluoride varnish and laser therapy or both treatment modalities in managing DH.

Method: Pubmed and Cochrane Library were searched for the relevant articles published for articles published in English. Clinical trials involving the varnishes and laser treatment were included involving patients that possess dentine hypersensitivity along with the extracted teeth. Twelve randomised clinical trials from 1999 to 2018 met the criteria were included in this scoping review.

Results: Combination of laser treatment and fluoride varnishes has better desensitising results of DH in comparison with either treatment alone.

Conclusion: The present review shows a combination of laser therapy and varnish can increase the success of the treatment compared with either treatment alone. However, more clinical trials and high quality studies are needed to confirm its results in a more precise way.

Keywords: dentine hypersensitivity, laser therapy and fluoride varnish, laser treatment, sodium fluoride varnish, systematic review.

INFLUENCE OF REMOVABLE DENTURES ON SALIVARY PARAMETERS: A REVIEW

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Introduction: Dentures are made of different materials and chemical compositions. Although these materials are claimed to be biocompatible, leaching of their chemical substance byproducts into the saliva has been reported in the literatures. The extent to which it effects the saliva flow rate, salivary pH and buffering capacity among different type of denture wearers is not well understood.

Objectives: This review aims to evaluate the impact of different types of removable denture prostheses on salivary parameters.

Methodology: Literature search was performed using Scopus, PubMed, and Google Scholar databases to identify the related articles using systematic search strategy. Searches were limited to original research articles that were published in English from January 2000 to December 2020. Out of 292, 23 articles that fulfilled the eligible criteria were selected.

Results: Among the selected articles, 7 and 16 studies adopted observational and prospective study design, respectively. Despite the heterogeneity in the type of dentures, intervals and study design, their findings on the saliva pH, buffering capacity and saliva flow rate are consistent. Although almost all studies reported an increase in the salivary parameters, all values were within normal range.

Conclusions: Removable dentures have no detrimental effect to the saliva flow rate, saliva pH and buffering capacity of patients. More studies with large sample size and further research to address the influence of flexible partial dentures are recommended.

Keywords: Removable partial dentures, removable complete dentures, saliva pH, buffering capacity, saliva flow rate

A REVIEW ON TOOTH LOSS DURING SUPPORTIVE PERIODONTAL THERAPY

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Introduction: Tooth loss is generally considered the final outcome of periodontitis. Determining the risk factor for periodontitis progression during Supportive Periodontal Therapy (SPT) phase would help dentists to control the frequency and contents of SPT visits. Therefore, the results of this study will serve as a basis to determine the effectiveness of initial therapy and significant impact of SPT.

Objective: To conduct a review on the occurrence of tooth loss and its associated factors during SPT among adults.

Method: Literature search was performed using four databases with multiple keywords within the interest of this research. Data collected from previous articles were from 2000-2019. Eleven previous research from 2004 to 2019 met the criteria.

Results: The occurrence of tooth loss in 11 studies were 1603 teeth. The highest occurrence in study by Pretzl et al., 2018 with 12.26%. The lowest occurrence of tooth loss was a study done by Chambrone et al., 2006 with percentage of 0.38%. The associated factors of tooth loss for each study showed different percentages and significant. Some studies have limited associated factors. Among all these factors, smoking factors, old age, male, and educational status were highly associated with occurrence of tooth loss.

Conclusion: Tooth loss during SPT is common and the associated factors increase the risk of tooth loss. However, this study did not reach definitive conclusions due to the heterogeneity among studies.

Keywords: Tooth loss, occurrence, SPT

**PREVALENCE OF PROBABLE TEMPOROMANDIBULAR DISORDERS AMONG
UNDERGRADUATE DENTAL STUDENTS AT SCHOOL OF DENTAL SCIENCES
UNIVERSITI SAINS MALAYSIA**

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Introduction: Temporomandibular disorders (TMD) represents problems involving the masticatory musculature, temporomandibular joint (TMJ) and associating structures. As TMD progresses, it may become irreversible. Hence, it is crucial to identify symptoms and predisposing factors of TMD especially in a community with high psychosocial factors such as dental students.

Objective: To investigate the prevalence of probable temporomandibular disorders among USM undergraduate preclinical and clinical dental students and its association with oral habit activities.

Methods: Data were collected online using the modified and validated Diagnostic Criteria for Temporomandibular Disorders self-reporting questionnaires and Oral Behavior Checklist (International RDC/TMD Consortium Network). The Chi-square test ($p < 0.05$) was conducted using SPSS 26.0.

Results: A total of 226 questionnaires were completed in this study. 59.0% preclinical students and 61.9% clinical students had experienced at least one symptom of TMD. Chin rest habit significantly associated with pain symptom, while clenching and playing certain musical instrument associated with headaches. Grinding, unilateral chewing and jaw bracing habits significantly predispose to close and open jaw lock respectively.

Conclusion: More than half of the students in both group experienced TMD symptoms. There were specific oral habit activities among USM undergraduate dental students that predispose to the certain TMD symptoms.

Keywords: Temporomandibular disorders, temporomandibular joint pain, jaw lock, dental students, oral habit activities

ASSESSMENT OF INTERPROXIMAL CARIES UNDER DIGITAL RADIOGRAPH AND INTERNATIONAL CARIES DETECTION AND ASSESSMENT SYSTEM (ICDAS)

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Introduction: Dental caries is a biofilm mediated, sugar-driven, multifactorial, dynamic disease that results in the phasic demineralization and remineralisation of the dental hard tissues. Interproximal dental caries is referred to carious lesion occurred at interdental surface of tooth and presented high caries rate among other surfaces. Several methods are available for diagnosis of carious lesion which are include visual, visual-tactile, dental radiograph, fiberoptic transillumination (FOTI) and electrical conductance. Among these diagnosis methods, visual tactile with ICDAS II criteria and radiograph are commonly employed by the clinician. In the clinical setting, once the interproximal caries is visualized and be coded with ICDAS II criteria, radiograph will be taken to confirm the diagnosis.

Objectives: To compare accuracy of ICDAS II and digital radiograph in the detection of interproximal caries of permanent teeth.

Methods: Ten posterior teeth with total of 20 interproximal tooth surfaces of selected patients were examined and ICDAS II scores were recorded. Then, digital bitewing radiographs were taken and scored. Lastly, interproximal caries extension for the validation was examined by removal of caries and was coded.

Results: Our result showed that accuracy of ICDAS II are 40% for both at enamel and dentin level. Meanwhile, accuracy of digital radiograph at enamel level is 10% and 60% at dentin level.

Conclusion: ICDAS II is more accurate in detecting caries at enamel level whilst digital radiograph is more accurate in detecting caries at dentin level.

Keywords: Interproximal, caries, ICDAS II, digital radiograph

INTERDENTAL PAPILLA DIMENSION: A REVIEW OF THE MEASUREMENT METHODS

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Introduction: Interdental papilla occupies the gingival embrasure, which is the interproximal space. Various methods were identified to measure the papilla dimension.

Objective: The review aims to identify various methods of measuring the interdental papilla dimensions.

Methods: Search for studies was conducted on electronic databases, including PubMed, Web of Science and Scopus, using specific key terms.

Results: Papilla dimension (PD) has been measured directly in the clinic, or indirectly using a radiographic image, dental model, and digital image. The interdental papilla is considered almost 100% present when the contact point to the bone crest is ≤ 5 mm. The vertical dimension measured by probing technique with/without surgical exposure providing accurate measurement but invasive. The radiographic bone length is recorded at ≤ 6.90 mm, CBCT papilla height recorded at 3.99 ± 0.61 mm while the direct clinical measurement using digital calliper recorded at ≤ 5 mm is alternative methods that is considered as non-invasive yet less accurate than the previous one. The horizontal dimension measured by special triangle ruler recorded the interproximal distance between root is < 1 mm resulted in higher number of papillae. By CBCT measurement, the mean width mesiodistal is 1.81 ± 0.39 mm while for radiographic measurement is 1.65 ± 0.66 mm. There is limited method measuring the labial palatal thickness of papillae. CBCT imaging recorded the mean value 8.67 ± 0.92 mm while probing come up with conclusion that thick and flat gingival biotypes exhibit short papillae on and vice versa.

Conclusions: Different methods were used in measuring the interdental papilla dimension. Depending on the purpose of measurement, each method has its own advantages and disadvantages.

Keywords: interdental papilla, papilla dimension, and methods of measurement

A REVIEW OF SPEECH PRODUCTION AFTER CLEFT PALATE SURGERY AMONG CHILDREN

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Introduction: Cleft lip and palate (CLP) are the most common congenital malformation in the craniofacial region. One in 1500 children in Malaysia have cleft palate with a higher predilection in males. Cleft palate children commonly have speech problems and can be assessed by speech pathologist. However, the speech production can be improved by attending speech therapy.

Objective: To write a review article aimed in identifying speech problems following cleft palate surgery among children.

Methodology: Literature search was performed using various databases such as NCBI, Google Scholar and Cochrane with multiple keywords within the interest of this research. Data collected from 10 previous articles being chosen were published in English and from 1990-2019.

Results: Results show percentage and frequency of different common speech disorders experienced by cleft palate children such as hypernasality, hyponasality, audible nasal emission, articulation errors and speech intelligibility. Among all these problems, hypernasality shows highest prevalence compared to others. There was statistically significant difference when comparing modified Z palatoplasty to double opposing Z-plasty and Sommerlad palatoplasty where the former technique produced more favourable speech outcomes. Quality of speech was poor with a significant difference among children who had palatal repair done after 2 years old compared to those performed before 2 years old. The improvement of all speech parameters can be seen in the children after attending speech therapy.

Conclusions: Hypernasality is the main speech problem experienced by cleft palate children after palate repair surgery. There was improvement in all speech parameters observed among patients after attending the speech therapy.

Keywords: cleft speech, cleft palate, speech problem cleft, hypernasality cleft, speech therapy cleft

REMINERALISATION EFFECT OF SILVER DIAMINE FLUORIDE, SODIUM FLUORIDE VARNISH ENHANCED WITH FUNCTIONALISED TRICALCIUM PHOSPHATE AND SODIUM FLUORIDE VARNISH (DURAPHAT) ON THE MICROHARDNESS OF ENAMEL: A SYSTEMATIC LITERATURE REVIEW

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Introduction: Topical fluoride is proven to reduce dental caries. The remineralisation potential of various topical fluoride is a debatable point.

Objectives: This study aim to evaluate the scientific evidence of the remineralisation effect of silver diamine fluoride (SDF), sodium fluoride enhanced with functionalised tricalcium phosphate (NaF+fTCP) and sodium fluoride varnish (Duraphat) on microhardness of enamel.

Methodology: Literature search was performed using Google Scholar, Pub Med and Elsevier databases to identify the related articles that are within the research interest using multiple keywords combinations. Searches were limited to articles published in English language from year 2010 to 2019. Thirteen articles were selected that fit the research interest and address the research question.

Results & Discussions: Published studies showed inconsistencies regarding the remineralization effect of SDF, NaF+fTCP and Duraphat on microhardness of enamel. SDF is reported to be having greater remineralisation effect on enamel, increasing enamel surface microhardness compared to Duraphat whilst one of the studies showed SDF and Duraphat having same remineralisation effect. On the other hand, nine researches reported that NaF+fTCP is more superior than Duraphat in increasing enamel surface microhardness but one study reported otherwise. One study reported that SDF has better remineralisation effect to increase enamel surface microhardness followed by Duraphat and NaF+fTCP.

Conclusions: Application of fluoride increases enamel microhardness and enhances remineralisation of incipient caries. However, studies have shown inconsistent effectiveness of fluorides on enamel remineralisation. Therefore, further clinical research is required to confirm these results.

Keywords: enamel remineralisation, silver diamine fluoride, sodium fluoride with fTCP, duraphat, microhardness.

A TEN-YEAR RETROSPECTIVE STUDY OF PATIENTS UNDERGONE TOTAL SURGICAL REMOVAL AND CORONECTOMY OF IMPACTED MANDIBULAR THIRD MOLARS AND ASSOCIATED FACTORS IN HOSPITAL UNIVERSITI SAINS MALAYSIA (USM)

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Introduction: Impacted mandibular third molars are commonly studied on its prevalence, the association between the position of impaction and complications. However, no literature concerning the types of impaction and demographic factors associated with the treatment options. Thus, this study was conducted to investigate this knowledge gap amongst the patients presented with impacted mandibular third molars in Hospital USM.

Objectives: To study the prevalence, types of impacted mandibular third molars, treatment options, and associated factors amongst the patients in Hospital USM from year 2009 till 2019.

Methods: This is a retrospective study based on medical records of patients in Hospital USM from January 2009 to December 2019. Data were analyzed using IBM SPSS Statistics version 26.0. Descriptive statistics and Chi-square test were applied in this study and the statistical significance was set at $P < 0.05$.

Results: Out of 99 treated patients' records assessed, the female to male ratio is 2.2:1. Age group of 21-30 was the highest (67.7%), with recurrent pericoronitis being the most common indication for treatment (47.5%). Mesioangular and IIA were the most common impaction types at 50.5% and 46.5% respectively. Impaction at level IIA was mostly associated with younger age group (21-30) at 35.4% and recurrent pericoronitis (26.3%), with a significant difference of $P=0.006$ and $P=0.013$ respectively.

Conclusion: Impacted mandibular third molar was prevalent in female patients aged between 21-30 years old. A significant association was found between IIA impaction with younger age group and pericoronitis. However, no significant association was found between treatment options and the associated factors studied.

Keywords: Impacted mandibular third molar, prevalence, association.

INTRALESIONAL CORTICOSTEROIDS IN THE MANAGEMENT OF ORAL LICHEN PLANUS AND LICHENOID REACTIONS

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Introduction: Lichen planus is a chronic immune-mediated inflammatory mucocutaneous disease which is triggered by exposure to unknown antigens, resulting in CD8⁺ cytotoxic T cell attack towards basal keratinocytes. The term oral lichenoid reaction (OLR) is used for lesions clinically and histologically resembling oral lichen planus (OLP), which is triggered by various systemic medications and contact allergy towards dental materials. Corticosteroids are widely used in treating atrophic and erosive forms of OLP and OLR, namely, to alleviate the symptoms. In comparison to systemic or topical corticosteroid therapy, intralesional corticosteroid injections (ILCI) are less commonly utilized. With ILCI therapy, a high concentration of the drug can be delivered locally to the lesional site, thus minimising systemic absorption and reducing side effects that are commonly associated with systemic route.

Objectives: This paper aims to give an overview on the use of ILCI in the management of OLP and OLR, as well as to highlight their efficacy and side effects.

Methods: A literature search of the databases PubMed, JAMA Network, Google Scholar, Science Direct, UpToDate and Scopus was performed from the last two decades till December 2019 with the keywords used alone or in combination.

Results: Most of the studies reported favorable outcome of ILCI in the management of OLP and OLR. The most common ILCI used was triamcinolone acetonide. The reported side effects were rare and transient.

Conclusion: ILCI can be used as an alternative treatment approach in managing OLP and OLR.

Keywords: Corticosteroid; intralesional; injection; oral lichen planus; oral lichenoid reaction.

RADIOGRAPHIC PREVALENCE STUDIES OF TOOTH SIZE AND TOOTH SHAPE ANOMALIES IN PAEDIATRIC PATIENTS

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Introduction: Tooth size anomalies comprise of microdontia and macrodontia whereas tooth shape anomalies include dens evaginatus, dens invaginatus, fusion, dilaceration, concrescence, gemination, taurodontism, odontomes, supernumerary root, enamel pearl, and pulp stone. There is no available data that encompass the entire subtype of tooth size and tooth shape anomalies in Malaysia.

Objectives: To determine the prevalence of tooth size and tooth shape anomalies and to assess the characteristics of these anomalies in paediatric patients using radiographs.

Method: This cross-sectional study involved the folder and radiographic review of 144 paediatric patients who attended the Paediatric Dentistry Clinic, Hospital Universiti Sains Malaysia (USM) from 2014 to 2019.

Results: The prevalence of tooth size and tooth shape anomalies in paediatric patients are 0.15% and 0.13%, respectively. Macrodontia (54.5%) was more common than microdontia (45.5%). Dens evaginatus, dens invaginatus, fusion, gemination, concrescence, supernumerary root, and enamel pearl recorded 0% prevalence. Dilaceration (63.2%) was the most common tooth shape anomaly followed by pulp stone (21.1%), odontoma (10.5%), and taurodontism (5.3%). Tooth size anomalies are significantly higher in males (63.6%) than females (36.4%). To the contrary, tooth shape anomalies are more prevalent in females (63.2%) compared to males (36.8%).

Conclusion: The prevalence of tooth size and tooth shape anomalies in paediatric patients are 0.15% and 0.13%, respectively. Tooth size anomalies are higher in males than females, but tooth shape anomalies are more commonly found in females compared to males. The most common tooth size anomaly is macrodontia, while dilaceration is the most common tooth shape anomaly.

Keywords: prevalence, tooth size, tooth shape, anomaly, radiograph, paediatric patient

RESTORATION OF ENDODONTICALLY TREATED TEETH: CHALLENGES AND OPTIONS

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Introduction: The remaining tooth structure and characteristic of endodontically treated teeth (ETT) determine the treatment planning and choice of restoration of the tooth. Questions and contradictory opinions often arise about the clinical procedures and suitable materials to restore these teeth.

Objective: To review the restorative challenges and options of endodontically treated teeth.

Methods: A literature search was performed using PubMed database to identify the related articles within the research interest using multiple keywords. The search was limited to articles that were published in English language from the year 2010-2020. References of relevant papers were used to complete the review.

Results: The progressively degrading sealing ability of temporary restoration and the lack of structural integrity of endodontically treated teeth due to extension of caries, access preparation, instrumentation of canal, and the use of root canal irrigants were the challenges in restoring ETT. With regard to these challenges, the options for restoring ETT include using endodontic post or fabrication of cast post and core build-up for tooth with one cavity wall remaining or less. When restoring ETT, previous in-vitro studies reported recently developed materials such as bulk fill composite and fibre-reinforced composite showed insignificant results when compared to conventional composite resin in regard of fracture resistance.

Conclusion: The lack of tooth structure in ETT posed a great challenge in restoring these teeth due to limited treatment options. Therefore, the tooth restorability and functional role of the teeth determine the indication of endodontic treatment or dental implant.

Keyword: Dental restoration, root canal treatment, characteristics of endodontically treated teeth, post and core

SEXUAL DIMORPHISM AND VARIATION OF THE MORPHOLOGY OF NASOPALATINE FORAMEN AND CANAL USING CONE BEAM COMPUTED TOMOGRAPHY (CBCT) : A COMPREHENSIVE REVIEW

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Introduction: Knowledge regarding the morphology of nasopalatine foramen (NPF) and canal (NPC) is essential prior to surgical procedures, orthodontic treatment, and local anaesthesia of the anterior maxilla. Detailed radiographic pre-surgical evaluation is needed to avoid complications. Cone beam computed tomography (CBCT) offers precise three-dimensional evaluation of the NPF/C.

Objectives: This review aims to appraise sexual dimorphism, morphology, and variation of NPF and NPC using CBCT. Parameters evaluated were length, width, area, and shapes of NPF and NPC as well as distance of NPC from maxillary central incisors.

Methodology: Literature search was performed using Google Scholar, PubMed, ResearchGate, ScienceDirect, and National Center for Biotechnology Information (NCBI). Related articles within the research interest and published between 1990 and 2019 were identified using multiple keyword combinations. 23 articles which fit the research interest and meet the selection criteria were selected.

Results: All parameters investigated showed variations between different studies. Several studies found that males have longer and wider NPF and NPC compared to females. In sagittal plane, single-canaled NPC was the most prevalent while cylindrical shape was the most common. From axial plane, round shaped NPF was the most common. NPC distance to maxillary central incisors were observed to be greater in males. In contrast, some studies reported that all parameters did not show any sexual dimorphism.

Conclusion: There are variations of the morphology of NPF and NPC as well as reported sexual dimorphism of their sizes. This information is beneficial for clinicians in evaluating the premaxillary region prior to any surgical procedures.

Keywords: Nasopalatine canal length, nasopalatine canal shapes, nasopalatine canal area, nasopalatine canal width, nasopalatine canal and maxillary incisors

FRACTURE RESISTANCE OF TITANIUM AND FIBER DENTAL POSTS: A META-ANALYSIS WITH TRIAL SEQUENTIAL ANALYSIS

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Introduction: Dental post and core are commonly used to support the restoration of endodontically treated teeth. The fracture resistance of the dental post is influenced by the post material.

Objectives: The objective of this study was to assess if there is a difference in fracture resistance between fiber and titanium posts.

Methods: An online electronic search was performed using the PubMed, Scopus and Web of Science databases for in vitro studies published from 2010 to 2020 in English. The retrieved eligible studies were selected based on title, abstract and full text of in vitro studies that compared the fracture resistance of fiber and titanium posts on human teeth. The pooled mean difference with 95% confidence interval was calculated. The trial sequential analysis (TSA) was performed to test if the available studies are sufficient to make a conclusive evidence.

Results: Nineteen studies were included in the qualitative analysis, while eighteen studies were included in the quantitative analysis and TSA. Difference in fracture resistance between glass fiber and titanium posts was significant, while there was no difference between quartz fiber and titanium posts. The pooled effect of all studies revealed no significant difference between fiber and titanium posts (mean diff.= -68.62; 95% CI= -135.90, -1.35; P= 0.05).

Conclusions: The results of the current evidence revealed no significant difference between fiber and titanium posts. Both dental posts demonstrated similar fracture resistance that enable them to be used clinically.

Keywords: titanium post, fiber post, fracture resistance, meta-analysis

A PRELIMINARY TRIAL OF NEW FORMULATION OF WHITENING TOOTHPASTE IN REDUCING TOOTH STAINING

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Introduction: Demand of whitening toothpaste has grown tremendously, however there is inadequate evidence of efficacy and safety of the whitening toothpaste in the market.

Objectives: Our aims were to evaluate the efficacy and safety of our new whitening toothpaste.

Methods: The extracted permanent human anterior teeth were subjected to mechanical tooth brushing with soft bristle toothbrush and a pea sized of the new whitening toothpaste and positive control, once per day for one week. Commercial toothpaste was used as a positive control. The tooth shade colour were observed using HIROX digital microscope KH 7700 at 100X magnification and their enamel density was evaluated using cone beam computer tomography scans before and after the intervention. Enamel density were measured at two different slices (2 mm and 4 mm from the tip of enamel) using Planmeca Romexis Viewer 2.2.7R.

Result: The results showed improvement of tooth shade colour using our new whitening toothpaste. The values of enamel density before the intervention at 2 mm and 4 mm were 1448.08 Hu and 1513.83 Hu; respectively. Interestingly, there were increment of enamel density after the intervention. The enamel density post intervention was 2893.28 Hu at 2 mm and 2983.33 at 4 mm.

Conclusion: Our new whitening toothpaste can improve the tooth shade colour without damaging tooth enamel.

Keywords: extrinsic tooth staining, whitening toothpaste, abrasiveness, enamel density

INFLUENCE OF ETHNICITY IN MALAYSIA ON PARENTAL PREFERENCE FOR PAEDIATRIC DENTAL BEHAVIOURAL MANAGEMENT TECHNIQUES: A PILOT STUDY

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Introduction: Parents play an important role for the successful dental management of their children, thus their agreement on behavioural management techniques (BMTs) selection is important. It was highlighted from the previous study that ethnicity is most likely to influence. Parental preference for various BMTs.

Objectives: To assess the parental acceptance of different BMTs used during the dental treatment of children in three major ethnicities in Malaysia.

Methodology: Parents of paediatric patients presenting to the paediatric dentistry unit in Hospital USM. A videotape was used according to American Academy of Paediatric Dentistry (AAPD) derived BMTs to showcase consenting parents ten of the AAPD approved BMTs consist of Tell-Show-Do, Voice Control, Modeling, Hand over Mouth, Action Restraints, Parental Presence/Absence, Distraction, Conscious Sedation, General Anesthesia and Nitrous Oxide and rated their acceptance on visual analog scale. Parental preferences were stratified by ethnicity and analyzed.

Results: Among the 33 parents (11 Malays, 11 Chinese and 11 Indian) who qualified and completed this study, 33 of them preferred non pharmacological techniques (Tell-Show-Do, Distraction and Parent Presence/Absence). Pharmacological techniques (General Anesthesia) were least accepted for Chinese and Indian parents. Modelling, HOM and PP/A techniques show a significant difference between the ethnic groups: M ($P=.087$), HOM ($P=.075$) and PP/A ($P=.022$).

Conclusion: Ethnicity influences parents' preference toward BMTs used on their children during treatment. Parents in Malaysia prefer non pharmacological techniques over pharmacological.

Keywords: behaviour management techniques, ethnicity in Malaysia, parental preference

**EFFECT OF MOBILE PHONE DEPENDENCE ON SLEEP QUALITY AND
PSYCHOLOGICAL SYMPTOMS AMONG DENTAL STUDENTS IN UNIVERSITI SAINS
MALAYSIA, USM**

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Introduction: Mobile phones use has increased in recent years and this may cause dependency. The mobile phone dependency may lead to poor sleep quality and psychological symptoms such as anxiety, depression, and stress.

Objectives: This study was aimed to explore the level of mobile phone dependence among dental students in Universiti Sains Malaysia and to determine its association with sleep quality and psychological symptoms.

Methods: A cross-sectional study was conducted among 88 undergraduate dental students in Universiti Sains Malaysia through self-rated questionnaires. Three sets of validated questionnaires were used in this study. Mobile phone dependence questionnaire (MPDQ) was used to assess the level of mobile phone dependence, Pittsburgh Sleep Quality Index (PSQI) was used to assess students' sleep quality and DASS-21 was used to screen for psychological symptoms.

Results: Thirteen students (14.8%) had high mobile phone dependence, 37 students (42%) had poor sleep quality and 48 students (54.5%) had psychological symptoms. However, there were no association between mobile phone dependence with sleep quality and psychological symptoms among the students.

Conclusion: Mobile phone dependence are low among the dental students and it has no correlation with sleep quality and psychological symptoms. However, there are high percentages of students who had poor sleep quality and psychological symptoms. This may indicate an unhealthy study environment especially for mental health. Further study needs to be done to explore the possible causes of these problems.

Keywords: mobile phone dependence, dental students, sleep quality, depression, anxiety

THE EXPERIENCE OF INDIVIDUALS WHO SEEKS DENTAL SERVICES FROM UNQUALIFIED OPERATORS: A QUALITATIVE STUDY

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Introduction: The ‘fake’ or ‘quack’ dentists are unqualified operators who provide dental services illegally and put the health of their customers at risk. It is not clear why individuals seek their services when a safe option is widely available in Malaysia.

Objectives: To explore the experience of individuals who sought dental treatment and services from unqualified operators.

Methods: This study recruited 8 participants who had fixed orthodontic appliance, dental veneer, and tooth whitening services using purposive sampling with predefined criteria that they had visited and received the services from unqualified operators. The participants were interviewed either via online or in-person, and the session was voice recorded. Semi structure interview with open ended and probing questions was conducted. The recordings were transcribed, and then thematic analysis was carried out with the use of Atlas.ti Version 9. Themes and subthemes were derived from the coded content.

Results: This study revealed 5 themes and 13 subthemes: reasons (dental condition related reasons and non-dental condition related reasons), mode of service (accessibility, operational, service nature, location, price), clients’ satisfaction (unsatisfied and satisfied), clients’ awareness (misconception and discovery) and impacts (oral health impacts and non-oral health impacts).

Conclusion: Individuals who sought the services of unqualified operators seemed to be naïve about dental treatment and services. They were unsatisfied with the services and some had experienced complications. Public campaign is recommended to raise awareness about oral health system and services in Malaysia prevent them from being deceived by unqualified operators.

Keywords: *fake dentistry, qualitative study, reasons, experience, awareness.*

NUTRITIONAL STATUS, SUGAR AND CARIES STATUS IN PRESCHOOL CHILDREN

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Introduction: Dental caries is one of the most chronic and prevalent diseases among children. Thus, sugar has been the dietary constituent which concerns the most in terms of its relation to dental caries. The development of dietary habits and childhood food preferences appears to be established early and may affect the oral health as well as general health and well-being of a child.

Objectives: To review the evidence available on the nutritional status, sugar exposure and caries status in preschool children.

Methods: A web search was conducted on the suggested databases such as PubMed, Scopus, etc. to identify the articles regarding nutritional status, dietary habits and caries status in preschool children. The search terms include “nutritional status”, “dietary habits”, “sugar exposure” “caries status” and “preschool children”. Articles were retrieved from dentistry journals and reference lists of selected studies on similar topics. The list of titles and abstracts of studies were reviewed by the researcher and co-researchers for inclusion. All literature with full text available that meet the criteria will be examined and the data will be extracted, followed by literature analysis.

Results: Results showed that sugar exposure has strong association with caries status. However, some studies found there were significant association between nutritional status and caries status and some do not. More likely, children with high BMI (overweight) are at risk of dental caries development.

Conclusion: More clinical studies on the association between nutritional status and caries status among preschool children is recommended.

Keywords: Nutritional status, sugar, caries status, preschool children

A CROSS-SECTIONAL STUDY OF TOOTHPASTE SELECTION AMONG PRIMARY SCHOOL CHILDREN

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Introduction: Daily use of fluoride toothpaste is a highly effective method in delivering fluoride to the tooth surface and as a major aid to caries prevention.

Objective: To assess parental pattern in selecting toothpaste for their primary school children.

Methods: This was a cross-sectional survey among 56 staff at School of Dental Sciences, Universiti Sains Malaysia. The online questionnaires contain items relating to socio demographic data of parents/guardian, main criterion of selecting toothpaste for their primary school children, toothpaste selection practice and knowledge about toothpaste for children.

Results: About 37.5% ($n=20$) respondents chose fluoride content as the main criterion for selection of toothpaste for their primary school children, followed by brand, flavour and self-believes. Half of the respondents stated that their children are still using children's toothpaste. Only 21.4% of the respondents were aware about brushing with toothpaste immediately after the eruption of the first primary tooth. Majority had limited knowledge regarding the type of fluoride in the toothpaste, while only 44.6% ($n=25$) of respondents practiced reading the fluoride label prior purchasing the toothpaste. There was association of parent/guardian's age with type and fluoridated toothpaste used for their children. Parents/guardians with tertiary education would significantly choose adult or children toothpaste rather than herbs toothpaste.

Conclusions: Half of the primary school children still used children toothpaste, and mostly with fluoride content. The fluoride label reading practice was still low among parents/guardians. There is a need for more vigorous dental health promotion regarding the recommended amount of fluoride in toothpaste among children according to age and caries risk.

Keywords: Toothpaste, Selection, Parents, Fluoride, Children

**PREVALENCE OF MOTOR VEHICLE INSURANCE CLAIM IN MAXILLOFACIAL
TRAUMA SECONDARY TO MOTORVEHICLE ACCIDENT IN THE HOSPITAL
UNIVERSITY**

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Introduction: Maxillofacial trauma refers to an injury at any area located at head and face region. The treatment of the maxillofacial trauma involves many steps including expensive surgical procedures. Insurance claim is part of this processes.

Objective: The study was undertaken to determine the prevalence of inability to claim motor vehicle insurance in maxillofacial trauma secondary to motor vehicle accident in our country specifically in our region.

Methods: This is a retrospective study of maxillofacial trauma cases of Hospital USM taken around July 2013 to September 2019. A total of 306 cases of maxillofacial trauma were included. Details of trauma information were collected from patients' record.

Results: Our data showed 29.3% of the person involves are unable to claim the insurance, mainly from the motorbike versus motorbike (69.3%) type of accident, followed by car versus motorbike (50%), motorbike vs large vehicle (33.4%), motorbike versus car (24.4%) and car vs car (14.3%).

Conclusion: There is less than 30% of patient unable to claim insurance in the motorvehicle accident involving maxillofacial trauma.

Keywords: maxillofacial, trauma, insurance claim, HUSM

KNOWLEDGE, ATTITUDE AND PRACTICE AMONG USM DENTAL STUDENTS TOWARDS BLOOD DONATION

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Introduction: Role of dental students in educating the public as well as advocating the blood donation cannot be understated as eventually this group will present part of the healthcare system.

Objective: To determine and compare knowledge, attitudes and practices between pre-clinical and clinical year students towards blood donation.

Methods: A cross-sectional study is conducted on 248 dental students' batch 2019/2020 in USM. An online questionnaire using Google Form was distributed to the participants. The collected data was analysed with SPSS 24.0. Independent sample t-test was used to compare mean of knowledge and attitude between clinical and pre-clinical dental students. While for practice, Chi-squared test is used to compare the practice between clinical and pre-clinical dental students. Significant level was set at $p < 0.05$.

Results: Most of the students were Malay (61.4%) and female (74.3%). Regarding the knowledge, 56.8% of the students answered correctly about the risk of blood donation that cause exposure to infection. There are 72.5% of the students strongly agreed that donating blood is very important. However, only 45.4% of the students had donated blood before. The independent t-test showed that significantly dental students in clinical years had better knowledge and attitudes compared to pre-clinical years with mean difference of 2.39 and 0.77 ($p < 0.05$).

Conclusions: The knowledge, attitudes and practices of dental students in USM were relatively low. The clinical year students are better of knowledge, attitudes and practice towards blood donations compared to pre-clinical students.

Keywords: Dental students, knowledge, attitudes, practice, blood donation.

PREVALENCE OF OVERWEIGHT AND OBESITY AMONG UNIVERSITI SAINS MALAYSIA DENTAL STUDENTS

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Introduction: Overweight and obesity are defined as abnormal or excessive fat accumulation that may impair health. The contributing factors that contribute to obesity include lack of physical activities, especially among teenagers and students.

Objectives: This study is aimed to determine the prevalence of overweight and obesity among dental students at Universiti Sains Malaysia (USM). Factors associated with overweight and obesity have also been identified.

Method: A total of 156 students participated in this cross-sectional study. A self-administered modified WHO STEPS Instrument questionnaire was used to collect the variables of interest. The body mass index was measured to determine the prevalence of overweight and obesity among USM dental students.

Results: The prevalence of overweight and obesity among USM dental students was 12.2%. Among those who are overweight and obese, none of the students are smokers. 15.8% of overweight and obese students had consumed alcohol. 89.5% of the obese and overweight students were physically active and performed moderate or vigorous physical activity weekly compared to 86.9% of non-obese and non-overweight students. Tobacco use, alcohol consumption, and physical activity were not associated with overweight and obesity among USM dental students.

Conclusion: In conclusion, less than one-quarter of USM dental students were overweight and obese. However, it is important to improve their weight to avoid overweight and obesity-related complications. Future effective health promotion programs and obese education should be emphasised.

Keywords: prevalence, overweight, obesity, physical activity

PERCEPTION, ATTITUDE TOWARDS MENTAL ILLNESS AND WILLINGNESS TO INTERACT WITH PATIENTS: A STUDY AMONG UNDERGRADUATE DENTAL STUDENTS

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Introduction: Mental illness is a psychological impairment involving emotions, cognitions and behaviours and its prevalence is increasing worldwide. Stable psychiatric patients may present to dental clinic for treatment. Dentist and undergraduates dental students undeniably would encounter patients with mental illness during their practice or training.

Objective: To determine the perception and attitude of undergraduate dental students towards patients with mental illnesses as well as willingness to interact with them.

Methods: This was a cross-sectional study using an online self-administered questionnaire. It was conducted among year 4 and year 5 from three dental schools in Peninsular Malaysia. We used a validated questionnaire from previous study. No sampling was applied. The collected data were analyzed by using the Statistical Package for Social Sciences (SPSS) software, version 24.

Results: A total of 225 students had participated in this study yielding the response rate of 63%. The majority of the respondents were Malay (84%) and female students (78%). Most students had perception of mental illness as a serious problem and 67% had strongly agree that people should do more to help them. In general, students were willing to interact with them. Respondents' university, gender and previous encounter with mental illness was found to be associated with willingness to interact ($p < 0.05$).

Conclusion: Undergraduate dental students seem to have fair perception, attitude and willingness to interact. Awareness and experience managing patients with mental illness during training will definitely make students a good dentist in future.

Keywords: Mental Illness, Perception, Attitude, Dental Students, Willingness

THE ASSOCIATION BETWEEN RECALL INTERVALS AND CARIES STATUS IN CHILDREN

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Introduction: The advancing caries management system for paediatric patients is to enhance primary prevention by actively monitoring lesion activity according to their caries risks. However, the effectiveness of dental recall interval protocols has been inconsistent due to its struggles on implementation. In this narrative review, various recall intervals and strategies were examined for their effects on caries status.

Objective: To review recent clinical studies that associates recall intervals and caries status in children.

Methods: A search of articles published between January 2000 and May 2020, were retrieved using PubMed, Medline, Scopus databases. The search used combinations of terms *children, recall visits, recall intervals, recall frequency, and caries status*. The list of titles and abstracts of studies were reviewed by the researcher and co-researchers for inclusion. All literature with full text available that meet the criteria were examined and the data were extracted, followed by literature analysis.

Results: Clinical studies showed a decrease in incidence and risk of caries when the assigned recall intervals were complied. Missing recall appointments caused: extension of non-supervision of dental condition, unfulfilled preventive efforts, exposure of risk for developing caries, and higher caries status. Annual school-based programs contributed to higher filled-teeth component. Limited data are available regarding how to address extended recall frequency.

Conclusion: When recall interval is lengthened, caries status is increased. The use of caries risk assessment based for individualized recall schedules are recommended so that early caries lesions can be treated in a nonsurgical manner.

Keywords: Children, recall visits, recall intervals, recall frequency, caries status

Patients' attitude towards rubber dam use during endodontic and restorative procedures

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Introduction: Many studies have been carried out in various populations to determine the patients' attitude towards rubber dam (RD) use during dental treatment. However, there is no reported data on the patients' attitude towards RD use based on gender, ethnicity, socioeconomic status and educational level in Malaysian population.

Objectives: To determine the patient's attitude towards RD use based on gender, ethnicity, educational level and socioeconomic status in Malaysian sub-population.

Methods: This was a cross-sectional questionnaire-based study that was carried out on the patients undergoing restorative and endodontic treatments using RD, at the undergraduate dental clinics of Hospital Universiti Sains Malaysia. A total of 106 patients participated and answered the questionnaire. The data was collected using random convenience sampling. For inferential statistics, Chi-square was used for association. $P < 0.05$ was considered significant.

Results: Satisfaction levels with use of RD, were not reported to be significantly different among males and females. Satisfaction in terms of level of comfort ($p = 0.001$) and recommendation for the use of RD to peers ($p = 0.004$) was significantly lower among Malay than Chinese, Indian and others. Patients with higher educational level were significantly more satisfied and were significantly more comfortable with RD usage than the lower educational level group ($p = 0.006$). Patients with higher income were significantly more satisfied and were significantly more likely to recommend RD use to their peers than the lower income group ($p = 0.005$).

Conclusion: Our results indicate an association between patient attitudes towards the use of RD based on ethnicity, educational level and socioeconomic status.

Keywords: Education level, Patient attitude, Patient satisfaction, Rubber dam, Socioeconomic status.

**PARENTAL ACCEPTANCE ON APPLICATION OF SILVER DIAMINE FLUORIDE ON
THEIR CHILDREN'S PRIMARY AND PERMANENT TEETH: A REVIEW**

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Introduction: Dental practices are affected by a viral pneumonia outbreak known as coronavirus disease (COVID-19). In the pandemic of COVID-19, aerosol generating procedures (AGPs) have to be avoided as the virus is transmitted through aerosols. Silver Diamine Fluoride (SDF) is a non-AGP and it is used for treating dental caries, especially in children. Despite its proven effectiveness, parental acceptance remains as a perceived obstacle to its usage because of the black staining effect. Hence, this article explores the level of parental acceptance of SDF on their children's teeth and factors influencing their decision making. The techniques to overcome the black staining effect of SDF is discussed briefly too in this article.

Objectives: To assess the level of parental acceptance on application of Silver Diamine Fluoride on their children's primary and permanent teeth, and to determine factors that influence their decision making.

Methods: Literature search of databases PubMed, Cochrane Library, and Google Scholar was performed to select related articles that are within research interest using multiple keywords.

Results: Most of the parents accept Silver Diamine Fluoride (SDF) on their children's primary dentition, on the posterior teeth, and if their children are uncooperative during dental visits.

Conclusion: Silver Diamine Fluoride (SDF) is an effective and non-aerosol generating procedure for dental caries management. Most of the parents accept the usage of SDF on their children's teeth. However, their preference is determined by type of dentition, location and the behaviour of their children.

Keywords: Parental Acceptance, Silver Diamine Fluoride, Black Staining, Child's Teeth

EFFECTIVENESS OF ORAL HYGIENE INSTRUCTION ON PERIODONTAL HEALTH IN ADULTS: A LITERATURE REVIEW

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Introduction: It is common for oral health professionals to give oral hygiene instructions during dental visits but the evidence on its effectiveness is inconclusive.

Objectives: To review the evidence on the effectiveness of various oral hygiene instructions methods on periodontal health in adults.

Methodology: The study searched the PubMed and Scopus databases for reports published between January 2000 to June 2020 in the English language. The quality of the selected articles was assessed using the PRISMA guidelines by two authors.

Results: A total of five reports met the inclusion and exclusion criteria. The heterogeneity in the outcome measures between the studies did not allow a direct comparison. Verbal, brochures were among the methods used in the studies. Oral hygiene instruction was found to have short (up to 13 weeks) term effects on dental plaque levels and/or gingiva bleeding. No significant differences were found between the different methods of oral hygiene instructions affecting periodontal health.

Conclusions: There is evidence that oral hygiene instruction is effective in reducing plaque and gingival bleeding scores in adult individuals, but it is still not clear if the effect continues beyond 13 weeks. No single method can be highlighted as the best medium of instruction.

Keywords: effectiveness, oral hygiene instructions, periodontal health, adults

**KNOWLEDGE AND ATTITUDE REGARDING OBSTRUCTIVE SLEEP APNOEA (OSA)
AMONG MEDICAL AND DENTAL PRACTITIONERS WORKING IN UNIVERSITI SAINS
MALAYSIA: A COMPARATIVE STUDY**

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Introduction: Obstructive Sleep Apnoea (OSA) is described as a temporary cessation of airflow when one sleeps. Patient with OSA often suffers from deteriorated work performance, worsened quality of sleep and life, and to a greater extent of a life-threatening event.

Objective: To compare the knowledge and attitude regarding OSA among medical and dental practitioners working in Universiti Sains Malaysia (USM).

Methods: It was a cross-sectional study involving general practitioners from medical and dental schools, together with medical and dental specialists working in USM. The sample size was made up of 104 respondents, with 52 medical practitioners and 52 dental practitioners. They were invited to the study via an online questionnaire. The data were collected by non-probability stratified random sampling. Statistical analysis was done using Independent T-test. Significance level was set at $P=0.05$.

Results: The mean age of the respondents was 34.6 years. The mean knowledge score was 10.24 (± 3.38). Medical and dental practitioners exhibited different knowledge level ($p < 0.05$) on OSA. Whereas for attitude items, medical practitioners attributed overall higher mean score towards considering OSA as a clinical disorder and identifying patients at-risk. Furthermore, they showed more confidence in managing patient with OSA as compared to their dental counterparts. Nonetheless, there were no significant differences for attitude items between both fraternities.

Conclusion: Medical practitioners working in USM showed greater depth of knowledge on OSA than dental practitioners. However, there was no significant difference in their attitude towards OSA as compared to dental practitioners.

Key Words: Obstructive Sleep Apnea, Medical and Dental Practitioners, Sleep Disorder

KNOWLEDGE AND AWARENESS OF FAKE BRACES AMONG SECONDARY AND TERTIARY STUDENTS IN KELANTAN

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Introduction: Fake braces has become one of the major concerns in many countries, including Malaysia.

Objective: This cross-sectional study aimed to evaluate the level of knowledge and awareness of fake braces and its side effects among secondary and tertiary level students in Kelantan.

Method: Three different sections of a self-structured questionnaires (dental, orthodontic and fake braces) using google form on online platform was used for distribution of the questionnaires in October 2020. Descriptive statistics (frequency and percentage) for all categorical data were analysed using IBM SPSS v.24.

Results: A total of 216 students n=103 (47.7%) secondary school students; male=24, female=79, and n=113 (52.3%) tertiary level students; male=24, female=89, participated. Ten secondary schools and six universities and colleges in Kelantan were involved. The result showed that n=93 (90.7%) of secondary school students and n=112 (99.1%) tertiary level students know regarding dental treatment procedures. Majority of tertiary level students have known about orthodontic treatment (80.5%, n=91) and aware (54.0%, n=61) on the prices compared to secondary students (45.6%, n=47) and (22.3%, n=23), respectively. More than 90% of the secondary n=95 (92.2%) and tertiary n=111 (98.2%) level students heard about fake braces and agreed that people seek for fake braces because of the cheaper price (n=184, 85.2%). Both categories of students n=119 (55.1%) identify customer's home was the location where fake braces are usually provided. Gum problems n=82 (72.6%) was identified as the most popular side effect by both groups, followed by mobile teeth and multiple caries.

Conclusion: The tertiary level students are more knowledgeable and aware regarding orthodontic treatment, fake braces and its side effects.

Keywords: Knowledge and awareness, fake braces and side effects, secondary and tertiary students

ASSESSMENT OF ANXIETY AND HAPPINESS AMONG UNDERGRADUATE DENTAL STUDENTS IN UNIVERSITI SAINS MALAYSIA

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Introduction: Undergraduate dental students experience anxiety throughout the dental education program, which may directly or indirectly affect them psychologically.

Objectives: The aim of the study was to assess the anxiety and happiness score and its relationship among undergraduate Universiti Sains Malaysia (USM) dental students.

Methods: This was a cross sectional study using a self-administered questionnaire among undergraduate dental students in USM. The Generalized Anxiety Disorder (GAD) and Subjective Happiness Scale (SHS) questionnaires were used to measure the anxiety and happiness score respectively. The participants were selected by a simple random sampling method. All statistical analysis was performed by using IBM SPSS version 24.0.

Results: A total of 222 students were participated in this study yielding 86.38% response rate. The mean anxiety scores were 2.50 (SD 0.87) and 1.47 (SD 0.77) while mean happiness scores were 1.48 (SD 0.68) and 2.28 (SD 0.83) for clinical and pre-clinical students respectively. There was a significant difference in the anxiety and happiness scores between clinical and pre-clinical students ($p < 0.001$). Clinical students have high anxiety score and low happiness score compared to pre-clinical students. Anxiety score among clinical and pre-clinical students are associated with happiness score ($p < 0.001$).

Conclusion: Anxiety level was at moderate and minimal whereas happiness level was at low and high for clinical and pre-clinical students respectively. This study reveals that anxiety level was negatively associated with happiness level among clinical and pre-clinical undergraduate USM dental students.

Keywords: Anxiety, happiness, undergraduate dental students

**ORAL HEALTH RELATED QUALITY OF LIFE AMONG FIXED AND REMOVABLE
DENTAL PROSTHETIC USERS IN A SELECTED UNIVERSITY HOSPITAL IN
KELANTAN (A COMPARATIVE CROSS SECTIONAL STUDY)**

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Introduction: Tooth loss impacts overall quality of life of the general population by affecting their oral and general health. It limits mastication, phonetics, anatomical stability and patient comfort. Removable or fixed prostheses can improve their oral health related quality of life.

Objective: The aim of this study is to compare oral health related quality of life between fixed and removable prosthetic users in Specialist Prosthodontics Clinic at Hospital University Science of Malaysia in Kelantan.

Methods: A total of 72 patients who have completed their treatment by dental prosthesis (36 are fixed denture users and other 36 are removable denture users) from Prosthodontic unit, Hospital University of Science Malaysia were included in the study. A structured questionnaire including Sociodemographic information, Problems of Dental Prosthetic Survey and Geriatric Oral Health Assessment Index (GOHAI) were used for data collection through a phone call interview. The total study period was from 17 August 2020 to 14 September 2020.

Results: Mean age of the respondent was 51.19, majority of them were female. Mean GOHAI score for fixed prosthesis users was 24.27 ± 0.48 and 30.02 ± 0.96 for removable prosthesis. Oral Health quality of life (GOHAI score) was significantly different between fixed prosthesis users and removable prosthetic users ($p < 0.05$).

Conclusions: Fixed and removable dental prosthesis have different impacts on oral health quality of life of dental prosthesis users.

Keywords: Dental prosthesis, Fixed, Removable, Oral Health Quality of Life