



# **COMPENDIUM OF ABSTRACTS National Oral Health Research Priorities 2023 - 2024**



# **COMPENDIUM OF ABSTRACTS NATIONAL ORAL HEALTH RESEARCH PRIORITIES 2023 - 2024**

Research Projects and Publications  
of Oral Health Personnel  
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## **Compendium of Abstracts: National Oral Health Research Priorities 2023–2024**

This compendium, curated under the National Oral Health Research Initiative (NOHRI) Executive Committee, serves as a key platform for sharing research findings in alignment with national oral health research priorities. It features a collection of abstracts derived from research presentations and publications, with the aim of fostering knowledge exchange within the dental community and promoting evidence-based practices.

As a summary, seven main oral health research priorities have been identified under this initiative:

1. Oral health conditions (inclusive of several subdomains)
2. Public oral health intervention and empowerment
3. Access to oral healthcare
4. Traditional and Complementary Medicine (TCM) in oral healthcare
5. Oral Tissue Engineering (OTE) and Regenerative Dentistry
6. ICT support systems for oral healthcare (Information and Communication Technology)
7. Digital Technologies in Dentistry

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# Foreword

I am honoured to present the second sequel of the Compendium of Abstracts: National Oral Health Research Priorities 2023–2024, which brings together 184 abstracts reflecting the continued advancement of oral health research in Malaysia.

Building upon the strong foundation established in the inaugural volume, this edition demonstrates sustained commitment among our researchers, clinicians and policymakers to generate high-quality evidence that informs practice and policy. Guided by the National Oral Health Research Priorities, the studies compiled herein continue to address key domains including service delivery optimisation, workforce strengthening, innovation and digital transformation, health promotion and oral disease prevention and management. Collectively, these efforts reinforce our national aspiration to enhance oral health outcomes through strategic, data-driven decision-making.

This document also reflects Malaysia's alignment with the World Health Organization's Global Strategy and Action Plan on Oral Health 2023–2030, particularly in advancing integrated people-centred oral healthcare, strengthening surveillance and research capacity, and fostering transparent reporting through multi-stakeholder engagement. The breadth of topics represented in this compendium underscores our responsiveness to emerging challenges, including evolving disease patterns, health inequities, technological advancements, and the need for sustainable service models.

This compendium is more than a repository of research findings; it is a reflection of our collective progress and a catalyst for future inquiry. It serves as a platform for knowledge exchange and a strategic reference to guide programme planning, policy formulation and clinical practice. I am confident that this publication will continue to inspire researchers, academics, clinicians, and decision-makers to pursue impactful collaborations that advance sustainable and inclusive oral healthcare in Malaysia and beyond.

I extend my sincere appreciation to the National Oral Health Research Initiatives (NOHRI) Executive Committee, all contributing researchers and collaborators whose dedication and expertise have made this sequel possible. May this compendium remain a valuable resource in strengthening evidence-based policy, driving innovation and shaping the future of oral health in our nation.



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## **EDITORS' NOTE**

This Compendium of Abstracts National Oral Health Research Priorities 2023–2024 constitutes the second national compilation of research abstracts published or presented by oral health professionals in Malaysia during the 2023–2024 period. The abstracts presented herein reflect research outputs generated through local and international scientific meetings, university dissertations, peer-reviewed publications, and research projects conducted nationwide, collectively contributing to the national oral health evidence base.

The National Oral Health Research Initiative (NOHRI) Executive Committee has endorsed the compilation of these abstracts as a strategic reference to support the identification and addressing of research gaps as outlined in the National Oral Health Research Priorities in Malaysia. Each abstract is duly credited with its corresponding publication or presentation details. The assignment of research domains is the responsibility of the Principal Investigator; however, the editorial committee may undertake revisions to ensure alignment with established priority domains and policy relevance.

The abstracts are systematically organised according to the domains defined under the National Oral Health Research Priorities in Malaysia. Inclusion in this compendium is limited to research projects published or presented between 2023 and 2024 and formally submitted by the respective Principal Investigators or institutional representatives. This publication is intended to inform researchers, programme planners, and policymakers in strengthening evidence-informed decision-making for oral health in Malaysia. The editors acknowledge and appreciate all contributors for their commitment to advancing national oral health research priorities.

### **The Editor**

**Compendium of Abstracts National Oral Health Research Priorities 2023-2024**  
**Oral Health Programme**  
**Ministry of Health Malaysia**  
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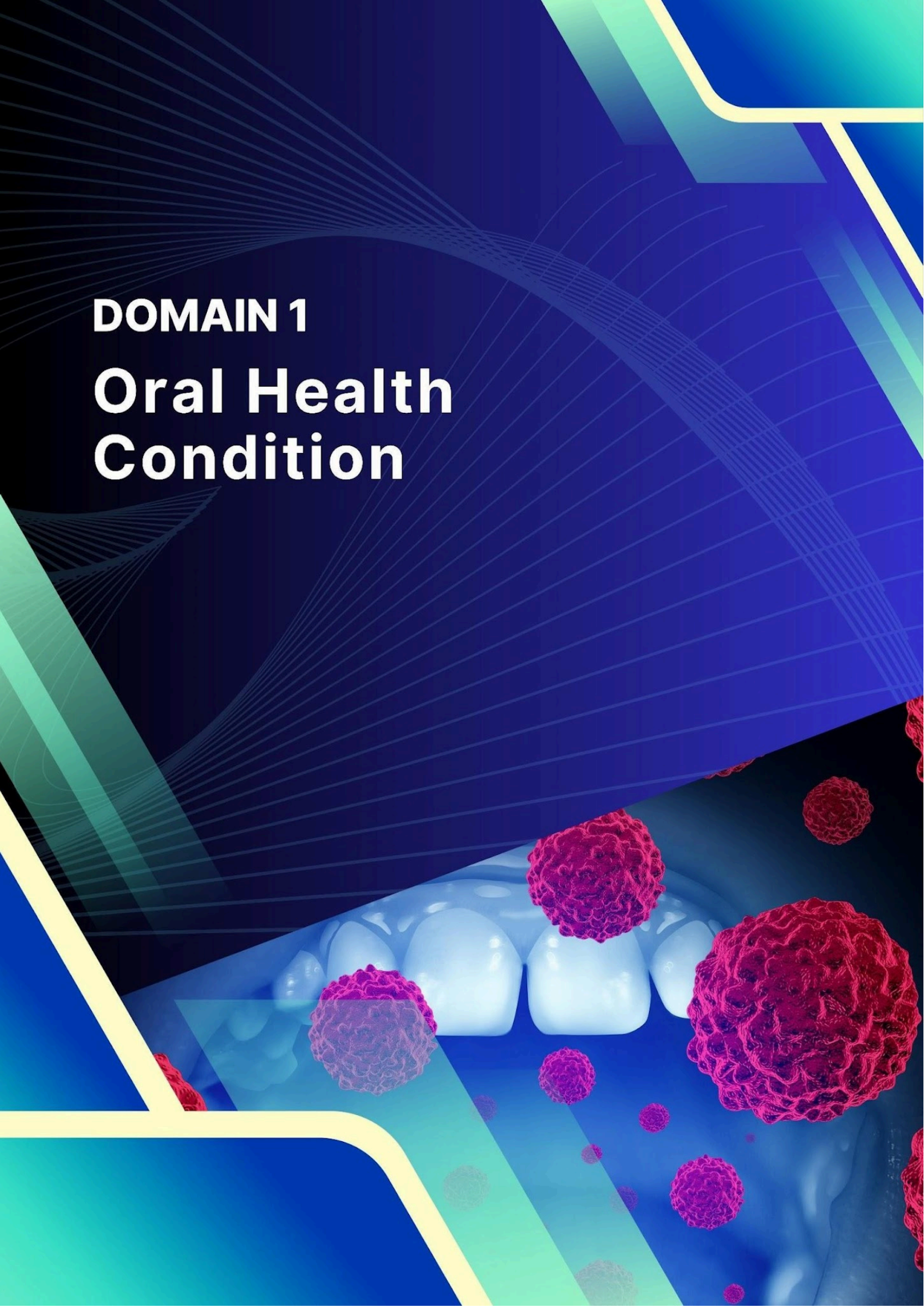
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**DOMAIN 1**

# **Oral Health Condition**



## 1. EFFECTS OF FURCATION INVOLVEMENT ON MOLAR SURVIVAL IN PERIODONTALLY TREATED PATIENTS

*Nurul Ain MY, Mohd Azri MS, Rusmizan Y*

**Objective:** This study aims to analyze the survival time of molar tooth according to furcation involvement (FI) classification among periodontally treated patients under a supportive periodontal care program. **Materials and Methods:** A retrospective study was conducted among 77 periodontitis patients with 240 molars who had undergone periodontal therapy that were followed up with supportive periodontal therapy (SPT) for at least five years. Periodontitis patients' data were retrieved from the periodontic clinical record. The clinical parameters of all involved molars and treatment modality were recorded at baseline and SPT. **Results:** A total of 69 (28.8%) molars were extracted during active periodontal therapy, while 17 (7.1%) were lost during SPT. The 5-year survival rate of molars was 83.5% (95% confidence interval [CI], 76.9-88.4) for FI=0 (n=141), 81.0% (95% CI, 56.9-92.4) for FI=I (n=18), 50.0% (95% CI, 33.8-64.2) for FI=II (n=21), and 25.0% (95% CI, 6.9-48.8) for FI=III (n=4). Additionally, the 10-year survival rate for molars with FI = III was 12.5% (95% CI, 1.0-39.2), which was lower than that of molars with FI = 0 (77.1%; 95% CI, 69.7-83.0). **Conclusions:** The presence of a high degree of FI classification, especially Class III, is associated with a lower survival rate of molars among periodontally treated patients. Retention of molars is possible on a long-term basis through a maintenance program of periodontal therapy.

**Keywords:** Furcation defects, molar, periodontitis, survival rate, tooth loss, clinical record

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## 2. THE AIRWAY EFFECT OF ALTERNATE EXPANSION AND CONSTRICTION OF MAXILLA WITH SKELETAL ANCHORAGE IN YOUNG ADULTS: A RANDOMIZED CONTROLLED CLINICAL TRIAL

Allam A, Ahmed B, Ab Rahman N

**Introduction:** The common consequences of skeletal maxillary deficiency are usually obstructive sleep apnea syndrome (OSAS) and other airway obstruction complications. The most effective treatment for transverse maxillary deficiency in growing children and adolescents is still conventional rapid maxillary expansion, while in adult ages miniscrew assisted rapid palatal expansion (MARPE) emerged extensively to resolve the controversy between conventional expansion's dental drawbacks, and invasive surgical osteotomies in older ages. The alternate expansion and constriction technique (ALT-RAMEC) is used to expand the maxilla in growing ages by producing subluxation of the circummaxillary sutures. **Methodology:** In this study, the conventional 7-week ALT-RAMEC protocol was modified and combined with MARPE to evaluate its efficiency and respiratory advantages over conventional MARPE in young adults. Twenty-nine patients with anteroposterior and transverse maxillary deficiency (mean age of 21.3) were randomly assigned to two groups. The conventional group received MARPE with its conventional rate of expansion, while the ALT-RAMEC group was treated with a combination of MARPE with ALT-RAMEC modified protocol. The efficiency of expansion, as well as airway effects, were assessed. Analysis of the change before and after intervention was examined using paired t-tests while analysis of the parameters comparing the two groups was examined using an independent t-test. The analysis of covariance (ANCOVA) was used when the baseline data was significantly different between groups. **Results:** The results showed 100% efficiency of both techniques to produce expansion in both groups. There were no additional effects of ALT-RAMEC on airway volume than MARPE did. Both protocols significantly increased the nasal cavity and oropharynx volumes and significantly decreased the nasopharynx and maxillary sinus volumes ( $p < 0.001$ ) with a non-significant difference between groups ( $p > 0.05$ ). **Conclusion:** The combination of MARPE and ALT-RAMEC techniques is a successful protocol in widening the maxilla transversally. However, it didn't have any more effect on airway volume than the conventional MARPE technique.

**Keywords:** Airway, ALT-RAMEC, orthodontic

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### 3. CROSS-CULTURAL ADAPTATION AND VALIDATION OF A SELF-ADMINISTERED URDU VERSION OF THE CHILD ORAL IMPACTS ON DAILY PERFORMANCES INDEX AMONG 11–12-YEAR-OLD CHILDREN IN LAHORE, PAKISTAN

*Khaliqa Z, Jamaludin M, Yusof ZMY*

**Introduction:** The Child Oral Impacts on Daily Performances (Child-OIDP) index was developed to assess children's oral health-related quality of life. **Objectives:** This study aimed to culturally adapt the self-administered Child-OIDP index into Urdu, evaluate its psychometric properties, and provide an initial estimate of oral impacts among 11–12-year-old children in Lahore, Pakistan. **Methods:** The translation of the Child-OIDP index from English to Urdu was performed, and the content and face validity of the initial Urdu version were evaluated by experts and 11–12-year-old children, respectively. The psychometric properties of the Urdu Child-OIDP were assessed by administering the index to 264 children aged 11–12 from five schools in the Lahore district. Psychometric properties were evaluated using criterion and construct validity, internal consistency, test-retest reliability, and global self-rated oral items, followed by an oral examination. **Results:** The standardized Cronbach's alpha was 0.77, and the weighted Kappa was 0.94 (intraclass correlation coefficient = 0.98). The index exhibited significant associations with subjective outcome measures, dental problem history, and dental caries status ( $p = 0.001$ ). Children reporting poor oral health, lower satisfaction with oral health, and experiencing oral impacts demonstrated higher Child-OIDP scores. Additionally, children with dental caries and perceived treatment needs exhibited higher Child-OIDP scores, indicating poorer Oral Health Related Quality of Life (OHRQoL). The prevalence of oral impacts was 88.3% (mean score = 17.8, standard deviation (SD) = 14.7). Eating performance was the most affected while speaking was the performance least affected, while toothache and sensitive teeth were identified as the two most common causes of oral impacts. Toothache was the primary cause of condition-specific impacts, responsible for the majority of oral impacts. **Conclusion:** This study demonstrates that the self-administered Urdu Child-OIDP index is a valid and reliable tool for assessing OHRQoL among 11–12-year-old children in Lahore, Pakistan.

**Keywords:** Child-OIDP, children, oral health-related quality of life, oral impact, psychometric, Urdu, validation

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#### 4. PREVALENCE AND ORTHODONTIC MANAGEMENT OF MISSING PERMANENT MAXILLARY LATERAL INCISOR AT A REFERRAL CENTRE IN SABAH

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**Introduction:** This was a cross-sectional study of the prevalence and orthodontic management of developmental missing permanent maxillary lateral incisor of patients referred for orthodontic treatment from year 2010 to 2020. **Methods:** The dental records of written case notes, radiographs, and study models that fulfilled the inclusion criteria were selected using systematic sampling and were assessed retrospectively. Sample were taken from every five dental records. Dental records that did not fulfil the inclusion criteria were substituted. Data taken were the demographic data, side of the missing maxillary lateral incisor, and the orthodontic management. All variables were analysed descriptively. The differences between orthodontic open space and orthodontic close space with respect of unilateral and bilateral missing permanent maxillary lateral incisor were tested using Fisher's exact test. **Results:** From the total of 291 samples, there were 11 (3.78%) patients presented with missing permanent maxillary lateral incisor. The mean age of the patients was  $17.46 \pm 1.52$  years. All 11 patients were females. There were six (54.55%) patients presented with bilateral missing permanent maxillary lateral incisor, while five (45.45%) were unilateral. From the unilateral group, there were three (27.27%) patients presented with right side missing permanent maxillary lateral incisor. Six (54.55%) patients were treated with orthodontic open space, while five (45.45%) patients were treated with orthodontic close space. **Conclusion:** In conclusion, the prevalence of missing permanent maxillary lateral incisor was 3.78%. All patients were females. More patients presented with bilateral missing permanent maxillary lateral incisor. The treatments provided were orthodontic open space and orthodontic close space.

**Keywords:** Prevalence, orthodontic, missing, lateral incisor, hypodontia

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## 5. FACTORS AFFECTING MANAGEMENT OF IMPACTED MAXILLARY CANINE: A RETROSPECTIVE STUDY

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**Aim:** Management of impacted maxillary canine differ due to various reasons. Interceptive treatment by extraction of primary canine during late mixed dentition is simpler in management, reduce treatment duration and cost effective compared to surgical intervention. This study aims to determine factors associated with different type of impacted maxillary canine management in orthodontic clinic. **Methods:** This retrospective study included 52 impacted maxillary canines which has completed its management from 2016 to 2021. Impacted maxillary canine characteristics including side, sector, height and angle of impaction were measured from pre-treatment radiographs. Likewise, factors associated with management of impacted canine such as sex, age and malocclusion were also evaluated. The statistical analysis included fisher's exact test to estimate influence of variable on the management of impacted maxillary canine. **Results:** Periapical and panoramic radiographs of 52 patients were used for data analysis. The mean age of patients at the beginning of treatment is 15.42 (SD 2.14). 76.9% of the impacted cases had undergone surgical intervention rather than interceptive treatment. The results indicated a statistically significant between management of impacted maxillary canine with the patient's age at the beginning of treatment ( $p<0.001$ ), the vertical height of canine crown to cemento-enamel junction of adjacent lateral incisor ( $p<0.05$ ) and the angulation of the impacted maxillary canine to the midline ( $p<0.001$ ). No significant correlation was found with other variables. **Conclusion:** Often multidisciplinary approaches were required to manage impacted maxillary canine successfully. Management is highly dependent on its position and the time when the impacted tooth was detected.

**Keywords:** Impacted maxillary canine, management, orthodontics

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## 6. FACTORS INFLUENCING TREATMENT SATISFACTION AMONG MALAYSIAN ORTHODONTIC PATIENTS

Yee RP, Mohd Razi R, Yusof ZYM, Soh EX, Fayed MS

**Introduction:** Patient satisfaction has relatively limited coverage in orthodontic literature. To date, no properly validated questionnaire instrument for orthodontic treatment satisfaction and its association with oral health-related quality of life (OHRQoL) has been published in Malaysia. Understanding factors influencing orthodontic treatment satisfaction may be able to improve treatment outcomes and patient compliance. **Objectives:** Part I – To cross-culturally adapt and assess the psychometric properties of the Malay versions of the Dental Impacts on Daily Living (DIDL-M) index and Orthodontic Treatment Satisfaction (OTS-M) questionnaire. Part II – To determine the overall orthodontic treatment satisfaction and oral health-related quality of life (OHRQoL) among Malaysian orthodontic patients, to investigate the correlation of OHRQoL, host factors, treatment motivation, concerns, discomfort during/ after treatment with overall orthodontic treatment satisfaction, and to identify significant factors associated with treatment satisfaction among Malaysian orthodontic patients. **Methods:** Part I – The cross-cultural adaptation process followed recommended guidelines with five stages: forward translation, synthesis, back translation, expert committee review and pretesting. A pilot study was conducted with a convenience sample of 100 patients who completed orthodontic treatment between 2019 – 2020 at the Faculty of Dentistry, Universiti Malaya to assess the psychometric properties of the DIDL-M and OTS-M questionnaire. A subset of the sample completed both questionnaires after two weeks to assess test-retest reliability. Part II – A field study was conducted using the validated DIDL-M and OTS-M with 149 patients who completed treatment between the 2020 – 2022 and who were not involved in the pilot study. The overall treatment satisfaction and OHRQoL were determined. Correlation of host factors, treatment motivation, concerns, discomfort during/ after treatment and OHRQoL with treatment satisfaction were analysed, and the significant factors for OTS were identified. **Results:** Part I – The original English versions and the back translations were similar in meaning, i.e. the DIDL-M and OTS-M had conceptual and item equivalence between the original and the Malay versions with no translation errors or deviations. Face and construct validity were satisfactory. Pilot testing demonstrated good internal consistency (Cronbach  $\alpha$  = 0.92 for DIDL-M and 0.812 for OTS-M) and test-retest reliability ( $r$  = 0.853 for DIDL-M and 0.776 for OTS-M score). Part II – The overall treatment satisfaction ratio was 83.9 per cent and the DIDL-M score was  $0.829 \pm 0.177$ , which was in the satisfaction range. There was a significant correlation between DIDL-M score ( $\tau$  = 0.363,  $p$  < 0.001) as well as discomfort during/ after treatment ( $\tau$  = -0.137,  $p$  = 0.029) with overall level of OTS. **Conclusion:** Part I – The pilot study provided the initial evidence for the reliability and validity of the DIDL-M and OTS-M. Further testing of the psychometric properties with a larger sample size is needed to support these results. Part II – The overall treatment satisfaction level and OHRQoL for orthodontic patients treated at the Faculty of Dentistry, Universiti Malaya was in the range of satisfaction. The significant factors for OTS were OHRQoL and discomfort during/ after treatment.

**Keywords:** Patient satisfaction, orthodontics, quality of life, questionnaire validation

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## 7. PREVALENCE OF PERIODONTITIS BASED ON THE 2017 CLASSIFICATION IN A PAHANG POPULATION

*Abas N, Nordin NN, Ismail R, Lim EL, Tan WJ, Kamaruddin F, Wan Ab Naim WS*

**Introduction:** The 1999 periodontal classification system has been used for the last 19 years. In 2017, World Workshop on the Classification of Periodontal and Peri-implant Diseases and Conditions released the new global classification system for periodontal diagnosis system. **Objectives:** The aim of this study is to determine the prevalence of periodontitis in Pahang Periodontal Specialist Clinics based on the 2017 World Workshop classification. **Methods:** This cross-sectional study involved all records of 390 newly referred patients in 2019 who came to Periodontal Specialist Clinics in Pahang. The prevalence of periodontitis was determined by calibrated examiners by using radiographs and clinical examination findings from periodontic records. **Results:** 343 patients (87.9%) fulfilled the 2017 Periodontal Classification criteria. The highest prevalence of periodontitis was Generalised Periodontitis (83.4%) followed by Localised Periodontitis (15.7%) and Periodontitis Molar-Incisor Pattern (0.9%). Stage I was observed in 1.2%, Stage II in 5.5%, Stage III in 44.9%, and Stage IV in 48.4% of the population. Grade A, B, and C was observed in 1.7%, 31.5%, and 66.8%, respectively. In combination, Gen-SIV-GC was observed the highest (40.5%) followed by Gen-SIII-GC (19.2%) and Gen-SIII-GB (16.0%). There were 9.0% smokers and 12.5% diagnosed with Diabetes Mellitus. Age was significantly influenced the stage of periodontitis ( $p=0.001$ ). **Conclusion:** The prevalence of periodontitis in Pahang Periodontal Specialist Clinics is very high in generalised pattern, severe (SIV) and rapid (GC) type of destruction. Periodontal status is associated with age.

**Keywords:** Grading, periodontitis, radiographic bone loss, staging, 2017 classification

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## 8. PROSTHETIC REHABILITATION OF POST COVID RHINO-ORBITO CEREBRAL MUCORMYCOSIS

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Covid 19 infection leads to reduced ciliary function, cytokine storm, thrombo-inflammation, microvascular coagulation and immune exhaustion. Hence, opportunistic infections such as mucormycosis are increasing in Covid affected patients. Covid infection has a tendency to worsen comorbid conditions like diabetes, hypertension, and cardiac disorders or even cause these life-threatening conditions in previously normal individuals. Corticosteroids used for the treatment of Covid puts the patients at risk of developing infections like mucormycosis since corticosteroids act as immune suppressors. At this juncture it is important to understand the pathophysiology, surgical/medical treatment as well the prosthetic rehabilitation of post covid rhino-orbito cerebral mucormycosis.

**Keywords:** Mucormycosis, black fungus, novel coronavirus disease-19, prosthetic rehabilitation, safety measures, infection control

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## 9. ENDOCROWN: AN ALTERNATIVE APPROACH FOR RESTORING ENDODONTICALLY TREATED POSTERIOR TEETH

*Nik Mansor WHA, Mohd Fauzi RR, Azman S, Zainon NA, Kamarozaman DMS, Mohammed Nadzirin HS, Muhammad Rawi MI*

**Background:** Successful clinical outcomes for endodontically treated teeth is dependent on adequate restorative treatment. While the full crown (FC) has always been considered the preferred option, it is associated with several disadvantages that justify the consideration of alternatives. Endocrown (EC) is a viable option to FC, offering a more conservative approach and requiring fewer appointments for completion. **Objective:** Assessing clinical outcomes and comparing the survival and success rates between ECs and FCs of endodontically treated posterior teeth. **Methodology:** A total of 140 teeth were included in this cross-sectional study which employed 2 calibrated examiners to examine ECs and FCs of endodontically treated posterior teeth placed between 2016 and 2022. Modified FDI index was used to evaluate the clinical performance of the crowns. In this study, the crowns with scores of 1 and/or 2 for each category were classified as having good clinical performance and placed in the success group. Teeth with scores of 1 and/or 2 and/or 3 in each category were classified as having acceptable clinical performance and placed in the survival group. The difference between the two groups was analysed using chi-square analysis. **Results:** In this study, 87% (n=122) of endodontically treated posterior teeth were restored with ECs, while 13% (n=18) were restored with FCs. The success rate for ECs is 38.5% (n=47) and the survival rate is 98% (n=120), while for FCs, the success rate is 50% (n=9) with a 100% survival rate. There was no significant difference between the success and survival rates of ECs versus FCs. The factors leading to non-survival of teeth restored with ECs were excessive occlusal wear (2.5%), material fracture (1.6%) followed by marginal adaptation (0.8%), and aesthetic anatomical form (0.8%). **Conclusions:** The findings concluded that ECs has acceptable clinical performance and is a reliable option to restore endodontically treated posterior teeth.

**Keywords:** Clinical performance, crown, endocrown, success, survival

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## 10. THE REFERRAL PATTERN OF HYPODONTIA CASES AMONG ORTHODONTIC PATIENTS IN UNIT ORTODONTIK KLANG AND UNIT ORTODONTIK BANDAR BOTANIK

*Hussain FA, Ahmad Razin SM, Ibrahim SN*

**Introductions:** Hypodontia is one of the most prevalent developmental problems in children. The patients with missing teeth in permanent dentition may have masticatory dysfunction and speech disturbance. Early diagnosis of this issue can help clinicians plan treatment and prevent complications, such as malocclusions and insufficient development of the alveolar bone. **Objective:** This study identified the referral pattern of hypodontia cases among orthodontic patients who have undergone orthodontic treatment in Unit Ortodontik Klang and Unit Ortodontik Bandar Botanik within 5 years (2016-2020). **Methods:** A total number of 38 hypodontia patients from 2016-2020 were included in this retrospective cross-sectional study. Data were obtained from patient's treatment records including referral letters and radiographs (orthopantomography). Descriptive statistics were performed for the study variables. **Results:** Most of the patients who have been referred in this study are 13 years old (34.2%). Clinician's incidental finding of hypodontia in patients was 68.4% and 31.6% were being referred for other concerns. The patient's main complaint for hypodontia was spacing between the teeth (44.7%). The maxillary left lateral incisor (36.8%) was the most frequently missing tooth and the highest number of missing teeth in the mouth was two teeth (44.7%). In this study, hypodontia predominated in females (76.3%) and in Malay ethnicity (50%). **Conclusion:** The spacing between the teeth was the main complaint among hypodontia patients and it affected their self-esteem and social interactions. This study also showed that most clinicians are aware of the problem, hence the early referral. However, there were significant number of clinicians who were not aware of the missing teeth. Thus, in order for the specialist to make an accurate diagnosis and formulate the treatment plan using a multidisciplinary team approach, clinicians or dental nurses must play a significant role in managing patients with hypodontia through early detection.

**Keywords:** Clinicians, missing, prevalence, spacing

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## 11. SINGLE NUCLEOTIDE POLYMORPHISM OF LEPTIN AND LEPTIN RECEPTOR GENES IN ORAL CANCER-A SYSTEMATIC REVIEW

*Hasanbasri SH, Sabri NA, Mokhtar KI, Mustafa BE, Ibrahim MS, Subramaniam PK*

**Introduction:** Oral cancer is one of the serious health problems diagnosed worldwide including Malaysia. While much research has been done on the gene polymorphism of leptin and leptin receptor genes in other cancers, few researchers have considered oral cancer. **Objectives:** Hence, this study aims to provide an insight into the association of a single nucleotide polymorphism of leptin and leptin receptor genes with oral cancer, as well as its contribution in increasing the risk for oral cancer development. **Methods:** Literature searches were conducted in six databases including Scopus, ScienceDirect, Web of Science, PubMed, Google Scholar, and Dimensions; focusing on articles published between 2000 to 2020. All relevant articles were screened accordingly using search terms “leptin”, “leptin receptor”, “single nucleotide polymorphism” and “oral cancer”. **Results:** A total of 2699 articles were retrieved. After following the inclusion and exclusion criteria, only four articles were included in this systematic review highlighting the three commonly studied polymorphic variant of leptin and leptin receptor which are LEP -2548 G/A, LEPR Gln223Arg, and LEPR K109R. Single nucleotide polymorphism of leptin and leptin receptor genes specifically LEPR Gln223Arg and LEP -2548 G/A may increase the risk of development of oral cancer. **Conclusions:** There were limited sources available to support the findings. Further research and investigations are needed to explore the mechanism of leptin and leptin receptor genes in the development of oral cancer.

**Keywords:** Leptin, leptin receptor, oral cancer, oral squamous cell carcinoma, single nucleotide polymorphism

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## 12. EVALUATION OF SEVERITY OF PERIODONTAL DISEASE IN PATIENTS WITH PERIODONTITIS USING PERIODONTAL RISK ASSESSMENT (PRA): A SINGLE INSTITUTIONAL STUDY

*Manickam P, Varghese T, Sivadas A, Jayasegaran S, Suraya N*

**Background:** Periodontal disease is a heterogeneous group of disorders affecting the periodontium, the most common of which are gingivitis and chronic periodontitis. Substantial evidence indicates that susceptibility to periodontal disease varies among patients and is the function of both acquired and intrinsic risk factors. The process of predicting an individual's probability of periodontal disease is called periodontal risk assessment. **Aim and objectives:** The purpose of this study is to identify the severity of periodontitis in case records of patients who visit the dental college using PRA. **Methodology:** 100 samples were collected consisting of patients with periodontitis. Data is collected from periodontal case sheets and periodontal charting and added into the PRA tool to gain the result. Results obtained are compiled and correlation is made between periodontal risks and demographic data of the patients. **Results:** In this study, from the overall results, patients with medium risk is 63% and high risk is 37%. Based on age group, the number of people with the highest number of medium risk are in the age group of 31-40 and 41-50 (77%) and high risk in the age group of 61-70 (75%). Based on gender, male had the higher risk of the disease compared to females (40%). Based on ethnicity, Indians showed a higher risk of the disease compared to the other communities (59% medium risk and 41% high risk). **Conclusions:** From the data analysed, periodontal risk assessment does not depend on one factor and depends on multiple factors, which includes BOP%, PPD  $\geq$ 5, number of tooth loss, percentage of BL/Age, Systemic/ General disease and environmental factors.

**Keywords:** Risk assessment, periodontitis, maintenance, risk evaluation, reinfection

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### 13. PATIENT SATISFACTION WITH IMPLANT AND IMPLANT SUPPORTED PROSTHESIS: A LITERATURE REVIEW

*Varghese T, Varghese A, Manickam P, Nafia binti Hussin F, Nabilah N, Izzureen R*

**Introduction:** Dental implant as a form of treatment for missing teeth has become desirable due to its ability to preserve the alveolar bone and resistance to dental caries as well as its high success rate, predictability, increased awareness among patients as well as its increased acceptance as a treatment option for missing tooth/teeth among patients. We could restore normal lifestyles that the patients once had like proper mastication, bringing back their aesthetic they wanted, normal speech and so on. The literature reviewed within this paper all studied the review patient satisfaction on implant and implant supported prosthesis. **Methodology:** Previous articles, literature and research studies by computer searching which studied the patient satisfaction on implant and implant supported prosthesis were reviewed. A MEDLINE search and a manual research were conducted from 2010 to 2022 to locate related articles on the topic. **Results:** Almost 100% studies reviewed regarding the patient satisfaction on dental implant treatments showed significantly achievable results in aspects of overall satisfaction, masticatory efficiency, aesthetics, comfort, speaking and phonation and high OHRQoL. All patients were strongly satisfied with their overall implant therapy and they were more comfortable after treatment compared than before as their quality of life has significantly increased after surgery. **Conclusion:** In conclusion, most of the related studies showed that dental implants have delivered reliable and satisfactory outcomes during various aspects of life assessment. Majority of the rehabilitated implants patients showed a significant improvement in masticatory efficiency, aesthetics, phonation, comfort, self-esteem, and the quality of life.

**Keywords:** Follow up implant treatment, implant prosthesis, prosthesis, quality of implant treatment, implant therapy and dental implant, oral health quality of life, patients' satisfaction on implant prosthesis

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## 14. INCIDENCE OF DISTAL CARIES IN MANDIBULAR SECOND MOLAR DUE TO IMPACTED THIRD MOLAR

*Varghese A, Varghese T, Shi WWT, Loh XY, Khoo KH*

**Background:** Mandibular third molar is the most common tooth to be impacted associated with the complication of distal caries on the mandibular 2nd molar. This can be prevented if the impacted tooth is diagnosed early and provided appropriate management. The aim of this study is to assess the incidence of distal caries in second molar due to impacted third molar in PIDC. The objectives of the study are to evaluate the incidence of distal caries in mandibular second molar by impacted third molar teeth together with the gender variation, angulation and age group in the incidence of distal caries of second molar. **Aims and objectives:** The present study is aimed to assess incidence of distal caries in second molar due to impacted third molar in Penang International Dental College (PIDC), Penang, Malaysia. The objectives of the study were to evaluate the incidence of distal caries in mandibular second molar by impacted third molar teeth, to assess the gender variation in the incidence of distal caries of second molar, to assess the association between distal caries and different types of angulations of third molar impaction and to assess the most prevalent age group having distal caries in mandibular second molar. Thus, the researchers are able to reduce the risk of distal caries in second molar by identifying its relation with the impacted third molar. **Methodology:** This is an evidence based study conducted on 45 patients, who have impacted 3rd molar with the age of 18 and above that visit the college PIDC. The gender variation, ethnicity, including the age of the patient are recorded. The periapical radiograph or pre-op OPG are taken to determine the impaction and distal caries. **Results:** According to this study results, 57.78% cases show caries on the distal aspect of the mandibular 2nd molar due to impacted 3rd molar. The incidence of distal caries with horizontal impaction was 46.15%. A majority of horizontal impaction cases were found as per the Pell and Gregory classification. Males show higher incidence compared to females (57.69%) with the age group of 23 – 27 and 28 - 33 (30.77%). **Conclusion:** In conclusion, more than half of the patients in PIDC have distal caries in the second molar due to the impacted 3rd molar, hence prophylactic removal should be considered, especially in horizontal impaction. Besides, males and patients with the age of 23 and above should pay more attention to their impacted 3rd molar as they have higher risk of developing distal caries in the second molar.

**Keywords:** Impaction, distal caries, mandibular molar, impacted 3rd molar, horizontal

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## 15. DETECTING UNDIAGNOSED DIABETES MELLITUS CASES AMONG NEW PERIODONTITIS PATIENTS ATTENDING UNIT PAKAR PERIODONTIK KLINIK PERGIGIAN KOTA DAMANSARA: A 6 MONTH CROSS SECTIONAL STUDY

*Latib N, Othman N*

**Aim:** To investigate the prevalence of undiagnosed Diabetes Mellitus in new periodontitis patients, to evaluate the pocket depth (PD), Clinical attachment level (CAL) and Bleeding on probing percentage (BOP%) and its severity in control group (Random blood sugar (RBS) 7.8mmol/l) and test group (RBS 7.8mmol/l) at baseline. The Improvement of periodontal health was checked 6 months post treatment in both groups concurrently with management of Diabetes Mellitus (DM). **Materials and methods:** Periodontitis patient (n = 63, 61.9% females, 38.1% male, Malay 52.4%, Chinese 38.1%, Indian 9.5% and mean age 44.95) recruited at initial visit. Only 46 patients attended for reassessment. All subject tested for capillary RBS using glucometer kit (Accu-check). Patient with RBS 7.8mmol/l referred to medical clinic for blood investigation and management. Both study groups received non-surgical periodontal therapy (NSPT) at baseline. Reassessment of clinical parameter was done 6 months after completed NSPT. Data was analysed using IBM SPSS version 29. **Results:** Prevalent of undiagnosed DM in this study was 25.4%. Mean RBS for control group was 5.59 (SD 0.77) mmol/l and test group was (12.41 (SD 4.86) mmol/l. T-test showed a no significant difference ( $p>0.05$ ) in all clinical parameter for control and test group at baseline indicate same severity at baseline. Paired T- test for baseline and reassessment for PD, CAL and BOP% in both group (n=46) showed a significant difference( $p<0.05$ ) except for CAL27, CAL37 and CAL46. Paired T-test for clinical parameter at baseline and reassessment in control group (n=38) showed a significant difference( $p<0.05$ ) result compared to test group (n=8) and this proved response to treatment is good in patient with normal RBS. **Conclusions:** Dental clinic which focus on periodontitis patients proved to be suitable location for screening undiagnosed DM. Bidirectional interaction between both disease has important clinical implication and thus will benefit dental professionals, medical team and most importantly the patient.

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## 16. PRE-ONCO DENTAL CARE FOR PAEDIATRIC CANCER PATIENTS: A SCOPING REVIEW

*Mohd Jabid N, Venkiteswaran A, Abdul Wahab H*

**Background:** In Malaysia, around 43 children are diagnosed with cancer every day. Both radiotherapy and chemotherapy are the treatment modalities for cancer management. Majority of these patients will present with some form of oral complications, namely mucositis and oral infections. There is currently no standardised protocol or guideline in Malaysia which addresses pre-onco management.

**Literature review:** A comprehensive literature search using 4 different engines was conducted to address the question 'what dental assessment and measures should be taken for a patient who is diagnosed with childhood cancer?'. 47 papers were included for this review which consisted of systematic reviews, prospective study, retrospective study, case report, cross sectional study, literature review and randomised control trial. The following items were extracted from the papers: i) relationship between medical and dental teams, ii) comprehensive dental assessment, iii) patient risk classification, iv) active dental management prior to chemotherapy, v) prophylaxis and prevention and vi) educational programs. **Conclusion:** A comprehensive pre-onco dental assessment is mandatory and should be carried out systematically to reduce treatment complications which may hinder the chemotherapy progress.

**Keywords:** Dental care, paediatric cancer patients, scoping review

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## 17. CURRENT AVAILABLE GUIDELINE FOR DENTAL CARE IN PAEDIATRIC CANCER PATIENTS: A SYSTEMATIC REVIEW

*Mohd Jabid N, Venkiteswaran A, Abdul Wahab H, Wan Mokhtar I*

**Background:** Children undergoing cancer treatment are susceptible towards dental diseases such as mucositis and oral infections which can in turn hinder chemotherapy procedure. The aim of this review is to identify and weigh the quality of the available CPGs in the oral care for paediatric cancer patients. **Method:** A comprehensive literature search using 4 different engines were guided by the central research question ‘What types of comprehensive dental care guidelines are available for paediatric cancer patients?’. Included guidelines were then assessed by a team of three appraisers using the Appraisal of Guidelines for Research and Evaluation II (AGREE II) tool. The quality scores was obtained from calculating each of six AGREE II domain scores and was used to determine the overall assessment of the CPGs. **Results:** There were 6 guidelines which fulfilled the criteria and included for this review. The quality of these guidelines were classified as high, intermediate or low. Only one CPG reached a score of >70% for every domain, and there are 3 other guidelines which had a mean of >70% and were classified as “high quality guideline”. In addition, the quality of CPGs is further ranked on the mean score of AGREE II values. **Conclusion:** Although there are four high quality guidelines, each of them have different areas of focus. Thus it is recommended that a consolidation of items be explored to develop a single, more comprehensive guideline for children undergoing cancer therapy.

**Keywords:** Guideline, dental care, paediatric cancer patients, systematic review

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## 18. ORAL HEALTH RELATED QUALITY OF LIFE AMONG MALAYSIAN RURAL CHILDREN: A STUDY USING CHILD-OIDP INDEX

*Pillay J, Natarajan M, Selvaraj S, Rao SM, Chandrasekaran ND*

**Introduction:** Dental disorders are reported to cause significant effects on overall quality of life (QoL). The aim of the present study was to measure the prevalence of oral impacts on daily activities and Oral Health Related Quality of Life (OHRQoL) among 12–16-year-old children in a rural school in Malaysia. **Methods:** A cross-sectional study was conducted on 195 participants age group 12-16 years. A pre-tested structured 'A Malay version of Child Oral Impacts on Daily Performances (Child-OIDP)' questionnaire was used as a tool for data collection. The data obtained was coded and subjected to statistical analysis. The mean OIDP scores were calculated for gender and age differences. Impacts on the 8 daily activities due to oral health problems were expressed as frequency and percentages. **Results:** The study population consisted of 195 participants with 49.7% (n=97) boys and 50.3% (n=98) girls. The study showed that the most prevalent impacts were difficulty in eating at 38.5%, difficulty in cleaning their teeth at 37.9% and difficulty in smiling and laughing at 29.2%. There was no significant difference between genders and age groups ( $p < 0.05$ ). The frequency of the impact was with a sizeable number reporting being affected once or twice a week and at moderate severity. The main conditions causing the impact were decayed teeth (38.2%), tooth ache (32.8%) and mouth ulcers (25.6%). **Conclusion:** A sizeable number of schoolchildren reported an impact to their OHRQoL in terms of disruption to performing one or more of the eight daily activities due to oral health problems.

**Keywords:** Child-OIDP, Oral Health Related Quality of Life (OHRQoL), daily performances

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## 19. ORAL MICROBIOME DYNAMICS IN TREATED CHILDHOOD CARIES: A COMPARATIVE STUDY

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**Background:** Dental caries is a multifactorial disease that results from interactions of susceptible host, cariogenic microorganisms, and fermentable carbohydrate sources. Our study explored oral microbiome shifts in children before and after dental treatment. **Methods:** Initial saliva samples were collected from caries free, moderate caries, and severe caries children based on the decayed, missing, and filled teeth index (DMFT/dmft) index. After three months of dental treatment, second saliva samples were gathered from the moderate and severe caries groups. The microbiota was analyzed by 16S rRNA gene-based high-throughput sequencing. **Results:** Most children with caries were between seven and eight years of age (40%), from middle-income group families (61%), highly educated parents (18% secondary level and 75% tertiary level) with good oral hygiene practices. There was a significant increase in alpha-diversity post-dental intervention. Firmicutes, Bacteroidota, and Proteobacteria were abundant across all samples. Post-treatment, Actinobacteria, and Firmicutes significantly decreased ( $p < 0.05$ ) while Fusobacteria, Proteobacteria, Spirochaetota, and Synergistota significantly increased ( $p < 0.05$ ). At genus level, a decreased trend was seen in Streptococcus, Prevotella\_7, and Rothia and an increased trend was seen in Fusobacterium, Neisseria, Haemophilus, and Leptotrichia, but was not statistically significant. **Conclusions:** This study on Malaysian children highlights that dental caries are influenced by factors like age, socioeconomic status, and diet, with oral microbiome diversity increasing post-treatment, though some harmful bacteria persist, indicating a need for targeted oral health education and further research on probiotics' role in caries prevention.

**Keywords:** Oral microbiome, children's oral health, dental caries, dmft/DMFT index, 16S rRNA sequencing, Malaysian children

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## 20. THE ASSOCIATION OF SOCIODEMOGRAPHIC FACTORS AND DENTAL CARIES AMONG SECONDARY SCHOOL CHILDREN IN JEMPOL DISTRICT OF NEGERI SEMBILAN, MALAYSIA

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**Introduction:** There is a slow trend in caries improvement among school children in Malaysia. This study aimed to analyse the association between gender, ethnicity and location of residence with dental caries occurrence among the secondary school children receiving incremental dental care in Jempol, Negeri Sembilan. **Methods:** This 4-year retrospective cohort study consisted of all secondary school children in Jempol initially aged 13-year-old in 2013 who were treated under the School Dental Service. Bivariate logistic regression was performed to analyse the association between gender, ethnicity, and location of residence with dental caries occurrence. The sample consisted of 942 school children. **Results:** Results showed a significant association between dental caries occurrence with gender and ethnicity. However, it was not significantly associated with location of residence. Females were 1.39 times more likely to develop new caries than males. Compared to the Indian ethnic group, the odds of developing new caries were 2.54 times higher for Malay (95% CI: 1.65-3.92) and 1.32 times higher for Chinese school children (95% CI: 0.77-2.26). **Conclusion:** The findings of this study can be used to identify the risk group early in life and tailored oral health services can be delivered according to their needs.

**Keywords:** Caries prevention, dental caries, incremental dental care, oral health problem, school children

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## 21. IMPACT OF NONSURGICAL PERIODONTAL THERAPY ON ORAL HEALTH RELATED QUALITY OF LIFE AMONG PRIMARY DENTAL CARE PATIENTS: A PROSPECTIVE COHORT STUDY

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**Aim:** The aim of this study was to determine the impact of non-surgical periodontal therapy (NSPT) on oral health-related quality of life (OHRQoL) of a selected group of the Malaysian population at the primary dental care setting. **Participants and methods:** This study was conducted from year 2021-2022. Patients attending 4 government dental clinics in Kinta district were included in the study after basic periodontal examination (BPE) was conducted. The sample size was calculated using the NCSS PASS 11 Power Analysis and Sample size and a final sample size of 94 was used. A short version of the Malaysian Oral Health Impact Profile, S-OHIP(M) questionnaire was given as a baseline prior to the intervention. Nonsurgical periodontal therapy was provided in a single session or by quadrant approach. Patients were then called for review after 6 weeks during when they were required to complete the S-OHIP(M) questionnaire again. All data were then entered and analysed using SPSS version 26.0. **Results:** The prevalence of impact decreased significantly post treatment [n (%) pre vs post: 91 (96.8%) vs 70 (74.5%);  $p<0.001$ ]. A significant decrease was observed in the severity of impact (ADD score) [median (IQR) pre vs post: 8.5 (5.0, 15.0) vs 2.0 (0.0, 6.0);  $p<0.001$ ] and extend of impact (SC score) [median (IQR) pre vs post: 0.5 (0.0, 2.0) vs 0.0 (0.0, 0.0);  $p<0.001$ ] post treatment compared to pre-treatment too. **Conclusion:** The OHRQoL status among gingivitis and mild to moderate periodontitis patients in primary care improved after treatment.

**Keywords:** Oral Health Related Quality of Life, periodontitis, nonsurgical periodontal therapy, primary care

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## 22. CHILDREN'S EATING BEHAVIOR: A COMPARISON BETWEEN CARIES FREE, EARLY CHILDHOOD CARIES AND SEVERE EARLY CHILDHOOD CARIES CHILDREN

*Dwen-Tjin L, Yazid F, Kuppusamy E, Hamzaid N, Hassan M*

**Background:** Children's eating behavior is important in caries prevention and progression, that can also affect growth and development. This study aims to determine the relationship between eating behavior and childhood caries. **Methods:** A cross sectional study was conducted on children aged 3–6 years old attending UKM dental clinic in Kuala Lumpur, Malaysia. Children were categorized into three groups consisting of caries free, early childhood caries (ECC) and severe early childhood caries (SECC), based on dental assessment using the decayed, missing and filled tooth index (dmft). A decayed tooth was defined as International Caries Detection and Assessment System (ICDAS) score 3 and above. Parents/caregivers provided sociodemographic information and filled the Children Eating Behavior Questionnaire (CEBQ). CEBQ consists of eight eating styles domains and the total scores were categorized into high and low category. Data was analyzed using chi-squared test. **Results:** A total of 90 children was recruited, majority boys (57%) and 38% were aged 6 years old. Most children were of Malay ethnicity and from middle-income group family. The prevalence of ECC was 28% and SECC was 39%. The mean dmft index was 6.71 with highest dmft value being 20. All domains in the CEBQ showed a higher percentage of children in the high category except for 'food responsiveness' and 'emotional over-eating'. High 'food fussiness' was significantly observed ( $p<0.05$ ) in SECC children compared to caries free and ECC children. **Conclusions:** Eating behavior particularly 'food fussiness' have relations to SECC children. Understanding eating behavior can be beneficial in dietary counselling for caries prevention.

**Keywords:** Early childhood caries, children eating behaviour, CEBQ

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### 23. 3 YEARS DATA OF PAEDIATRIC PATIENTS TREATED UNDER GENERAL ANAESTHESIA FOR CARIES MANAGEMENT

*Sockanathan L, Dom TN, Aizuddin AN, Yazid F*

**Introduction:** There is a scarcity of data available in Malaysia regarding the utilization of GA for management of dental caries among paediatric patients. This study aims to investigate the dental records of paediatric patients treated under general anaesthesia (GA) for caries management at Hospital Canselor Tuanku Muhriz (HCTM), Kuala Lumpur. **Methods:** This is a retrospective cross-sectional study between January 2017 to December 2019 on patients who underwent caries dental treatment with ICD-10 Code K02.9 under GA. Data extracted includes demographic data, referral source, comorbidities, treatment done and dental treatment procedural time. **Results:** Mean age of children treated is 5.91 years. Males were higher with 62.1%. Majority of the referrals are from internal referral with 65%. 60% of the children had comorbidities. 94.3% of children had extraction of their primary teeth. Mean dental treatment time was 52.87 minutes. Younger children utilized dental GA more often than older ones. More than half of the cases required extraction of deciduous teeth. There is also high utilization of GA among medically ill patients. **Conclusion:** Oral health of children with medical illness is often neglected because of their systemic disease and ongoing medical treatment. By the time the child gets a dental treatment, it is too late to save the tooth.

**Keywords:** Caries, paediatric, general anaesthesia

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## 24. ACTIVITY-BASED COSTING OF COMMON CARIES TREATMENTS AMONG PAEDIATRIC PATIENTS

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**Background:** Activity-based costing (ABC) is a micro-costing method. Despite being an accurate tool for cost calculation, ABC system is rarely applied in the dental fraternity as it is complex to be conducted. Data gathered through ABC is beneficial in bridging the gap between policy makers who emphasise on cost saving and the practitioners who emphasise on quality of treatment. **Aim:** To conduct an ABC of common treatments for caries management among paediatric patients at Hospital Canselor Tuanku Muhriz (HCTM), Malaysia. **Methods:** ABC was conducted through a clinical pathway to lay out the routine activities of dental caries management among paediatric patients, and to gather information about the equipment, instruments and consumables used, personnel involved, and the time spent for each procedure. Then, these resources were assigned into different categories namely equipment more than RM 500.00, instruments less than RM500.00, consumables and staff salary. Finally, cost drivers were determined by calculating the amount of resources used and the time spent. **Results:** Based on the clinical pathway conducted, there were 10 common treatments for caries management for paediatric patients. The common treatments involved were fissure sealant, glass ionomer cement (GIC) restoration for primary teeth, composite resin (CR) restoration for primary teeth, CR restoration for permanent teeth, strip crown restoration, stainless steel crown (SSC) restoration, pulpotomy, pulpectomy, extraction and scaling. The price range of treatment ranged from RM 60.00 to RM 450.00. Pulpotomy had the highest cost, whereas extraction of teeth had the lowest cost. **Conclusion:** Study on costing is important to reduce the gap between the demand in dental treatment and the limited resources available to perform the treatment. ABC is deemed to be appropriate to be used in this study as dental treatments are largely procedure-based and this costing method produces a more precise and transparent data. The outcome of this data provides a tool for other hospitals to be used as a standardised approach for treating these patients and subsequently improve the quality of dental care given.

**Keywords:** Activity-based costing, paediatric, clinical pathway

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## 25. DEVELOPMENT AND VALIDATION OF A QUESTIONNAIRE ON PERCEIVED PROSTHODONTIC TREATMENT NEEDS IN MALAYSIAN ADULTS

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**Statement of problem:** A discrepancy between dentists' assessments and patients' expectations during prosthodontic treatment is inevitable. Incorporating dental patients' concerns about their prosthodontic treatment needs is essential during treatment planning, yet studies assessing these needs in adult dental patients are lacking. **Purpose:** The purpose of this study was to develop and validate a novel instrument, termed the questionnaire on perceived prosthodontic treatment needs (PPTN), that assesses perceived prosthodontic treatment needs in adults. **Material and methods:** The PPTN was developed following a literature review, consultation with healthcare workers, and patient interviews. It included 15 questions and a self-rated need for prosthodontic treatment, categorized on a Likert scale. A cross-sectional descriptive study was completed on 193 dental patients seeking or receiving prosthodontic treatment. **Results:** Three perceived prosthodontic treatment need factors were identified (psychosocial impact, esthetic concern and function) by using exploratory factor analysis. A higher PPTN score indicated greater perceived prosthodontic treatment needs. The identified factors represent 67.8% of the variance with eigenvalues of >1. The PPTN had a high degree of internal consistency and reliability, as the final questionnaire received a Cronbach alpha of 0.75 and an intraclass coefficient of 0.75 with a 95% confidence interval of 0.68 to 0.80 [ $F(192, 576)=3.94, P<.001$ ]. **Conclusions:** The newly developed questionnaire was valid and will help understand patients' perceived treatment needs and benefit further prosthodontic research and clinical application.

**Keywords:** Perceived, prosthodontic, treatment needs

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## 26. TYPE 1 DIABETES MELLITUS PATIENTS' SELF-PERCEPTION OF PERIODONTAL DISEASES

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**Objectives:** The study aimed to evaluate type 1 diabetes mellitus (T1DM) patients' self-perceived periodontal health status and to identify the association between periodontal disease (PD) and DM. **Materials and methods:** This cross-sectional study included 113 T1DM children between 3 and 18 years old from the Universiti Teknologi MARA and the University of Malaya. Periodontal health parameters, including plaque index, gingival index, probing pocket depth, simplified basic periodontal examination, and clinical attachment loss, were recorded. Self-perceived periodontal health status was assessed with questionnaires. **Statistical analysis:** Statistical analysis was performed to evaluate the sensitivity of the questionnaire and the relationship between T1DM and periodontal parameters. **Results:** The median age was 11.4 years. Half of them (50.4%) were females. A total of 83.5% rated their oral condition as good, whereas 27.5% reported a history of gingival bleeding. Clinical examination revealed that 48.7% had healthy gingiva, whereas 47.8% had gingivitis. The question "Do you have bleeding when brushing, flossing, or eating food?" showed good accuracy in the evaluation of PD ( $p < 0.001$ ). **Conclusion:** The questionnaire has a high potential to be used by medical professionals in identifying T1DM patients at risk of PD to guide nondental health care providers in making appropriate referrals to dental services.

**Keywords:** Periodontal disease, type 1 diabetes mellitus, diabetes mellitus, oral health, self-perception

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## 27. THE ASSOCIATION BETWEEN FUNCTIONAL TEETH, DENTURES AND ORAL HEALTH RELATED QUALITY OF LIFE AMONG OLDER ADULTS IN DUNGUN, TERENGGANU

*Abdul Aziz NA, Gnanapragasam SS, Omar F, Che Ariffin ZH, Mohd Jailani SS, Said UN, Mohd Shaari S, Yusoff NFI, Pathmamothie P, Jeffry SJ*

**Introduction:** The Malaysian National Oral Health Strategic Plan 2022-2030 identifies having at least 20 teeth by the age of 60 and prompt denture delivery to the elderly as key indicators to support the oral health, social participation, and daily functions. This study aimed to assess the association between the remaining functional teeth, denture presence, and oral health-related quality of life (OHRQoL) among older adults in Dungun, Terengganu. **Method:** This prospective cross-sectional study involved 221 older adults aged  $\geq 50$  who attended government dental clinics in Dungun. Participants underwent oral health examinations and completed the self-administered questionnaires on sociodemographic data and the Malay-validated Geriatric Oral Health Assessment Index (GOHAI) to assess OHRQoL. Descriptive statistics, ANOVA, and multiple linear regression analyses were performed using SPSS version 29. **Result:** There was a statistically significant difference in GOHAI scores between different categories of the functional teeth and denture presence,  $\chi^2(5) = 16.32$ ,  $p < 0.05$ . Post hoc tests showed that having a denture among older adults with fewer than 20 teeth was significantly associated with the GOHAI score. After controlling for confounders, denture presence ( $p < 0.001$ ) and occluding pairs ( $p < 0.001$ ) were significantly associated with higher GOHAI scores, while pathological teeth ( $p < 0.05$ ) were significantly associated with lower GOHAI scores. **Conclusion:** This study demonstrated the significant effect of the functional teeth and denture presence on the OHRQoL of older adults. These findings can assist the policymakers in emphasizing more comprehensive oral health care services for older adults, including promotive, preventive, curative, and rehabilitative measures.

**Keywords:** Older adults, Oral Health-Related Quality of Life (OHRQoL), functional teeth, denture presence, Geriatric Oral Health Assessment Index (GOHAI)

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## 28. ORAL HEALTH RELATED QUALITY OF LIFE AND ITS ASSOCIATED FACTORS AMONG PRE-ELDERLY AND ELDERLY ATTENDING PRIMARY DENTAL CLINIC IN DUNGUN, TERENGGANU

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**Introduction:** The elderly are an important priority group identified for the delivery of oral healthcare services in Malaysia, with the aim of improving their oral health status and oral health-related quality of life (OHRQoL) under the National Oral Health Strategic Plan 2022- 2030. However, achieving this goal presents a challenge in Terengganu due to the high prevalence of oral diseases. This study aimed to assess the oral health-related quality of life (OHRQoL) and its associated factors among the elderly and pre-elderly in Dungun, Terengganu. **Methods:** This cross-sectional study involved pre-elderly participants aged 50 to 59 years and elderly participants aged 60 years and above who attended government primary dental clinics in Dungun. Participants underwent oral health examinations and completed self-administered questionnaires on sociodemographic data and the Malay-validated Geriatric Oral Health Assessment Index (GOHAI) to assess OHRQoL. Descriptive statistics, independent t-tests, ANOVA, and multiple linear regression analyses were performed using SPSS version 29. **Results:** The sample consisted of 90 pre-elderly and 131 elderly participants. The mean GOHAI score among the pre-elderly and elderly was 35.88 ( $\pm 6.71$ ) and 36.84 ( $\pm 7.07$ ), respectively. After controlling for confounders, the presence of dentures ( $p < 0.001$ ) and occluding pairs ( $p < 0.001$ ) were significantly associated with higher GOHAI scores for both pre-elderly and elderly participants. Pathological teeth ( $p < 0.05$ ) were significantly associated with lower GOHAI scores in the pre-elderly only. **Conclusion:** This study highlights that factors such as the presence of dentures and a higher number of occluding teeth positively affect OHRQoL among the pre-elderly and elderly, while a lower number of pathological teeth positively affects OHRQoL among the pre-elderly. These findings advocate for policymakers to enhance delivery of comprehensive oral healthcare services for these populations to enhance their overall OHRQoL.

**Keywords:** Denture presence, occluding pairs, pathological teeth, Geriatric Oral Health Assessment Index (GOHAI)

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## 29. ODONTOGENIC OROFACIAL INFECTION IN CHILDREN: A COMPREHENSIVE STUDY IN HOSPITAL SULTANAH BAHYAH

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**Background:** Odontogenic orofacial infection (OOI) among paediatric populations is prevalent in dental clinics and emergency departments. Untreated caries leading to pulp necrosis is the primary cause of OOI, despite other factors such as dental trauma, mismanaged deep restorations, and infections of the periodontium. Clinical presentations of OOI includes cellulitis, swollen buccal sulcus and gingiva with history of toothache. Progressing untreated odontogenic infections can spread through anatomical spaces leading to severe and systemic complications including fever, sepsis, Ludwig's angina and cavernous sinus thrombosis. Furthermore, children experience more acute and systemic symptoms than adults which often necessitate hospitalisation. **Objectives:** To investigate the characteristics, aetiology and management of OOI among paediatric patients attending Paediatric Dental Department, Hospital Sultanah Bahiyah. **Methods:** This study employs a retrospective cross-sectional design utilising medical records of paediatric patients under 16-years-old who presented to the Paediatric Dental Department, Hospital Sultanah Bahiyah (HSB) with OOI over a 36-month period (January 2021 until December 2023). **Results:** A total of 57 children (20 girls, 37 boys) were treated for OOI, with an average age of  $6.26 \pm 3.19$  years. 66.7% of children hospitalized with mean hospitalisation length of  $3.32 \pm 4.53$  days. Upper-face and lower-face infections were reported in 45.6% and 54.4% of the study population, respectively. Infections originating from deciduous teeth (82.5%) were more prevalent than those originating from permanent teeth (17.5%). There was a significant association between the source of infection and the site of swelling ( $p < 0.001$ ). A variety of treatment approaches were employed, including surgical management under local or general anaesthesia with antibiotics, delayed surgical intervention after a course of antibiotics or antibiotic alone. **Conclusion:** OOI in paediatric populations can have significant implications for both short-term and long-term health outcomes. Understanding the clinical characteristics and factors influencing paediatric orofacial infections is critical for improving diagnosis, clinical management and enhancing preventive strategies.

**Keywords:** Caries, facial cellulitis, hospitalization, paediatric

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### 30. A CROSS SECTIONAL STUDY QUALITY OF LIFE OF PATIENT AFTER ENDODONTIC TREATMENT

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**Introduction:** Literatures has shown endodontic disease adversely impact on the daily quality of life of patients. However, the evidence of the effectiveness of endodontic treatment and criteria of success have mainly been considered in terms of clinical outcome. There is still a lack of information about treatment outcomes from patient's perspectives. By evaluating patient's viewpoint through the Malaysian Oral Health Impact Profile (S-OHIP(M) 14 Questionnaire and the Seven Semantic Differential Scales it might help us better understand and provide an excellent dental service for the patient. **Objective:** To assess the changes in quality of life of patient after endodontic treatment. **Methods:** 150 patients from the seven selected dental clinics in Terengganu were involved. They were chosen by convenient sampling in this cross-sectional study from 1 February 2020 to 27 January 2023. The patients were interviewed before and one month after the completion of endodontic treatment. The study instruments were the short version of the Malaysian Oral Health Impact Profile (S-OHIP(M) 14 and seven semantic differential scales on the evaluation of endodontic treatment. Data was analysed by descriptive statistics and nonparametric analyses. **Results:** In this study, 33.3% of patients were male and 66.7% of patients were female. Most of the patients were Malay (98.7%) and 78.7% were from the B40 income group. The changes in quality of life in psychological discomfort were reduced from 75.3% (113) to 40% (60). It was only 19% patients still had the impact of physical pain compared to 64.6% of patients before the endodontic treatment. 90% of the obturation in endodontic treatment were good in terms of quality, tapering and the working length of the obturation. The correlation between the pain and chewing ability showed significant result. **Discussion:** This study represents the gauge patient perceptions of the impact of endodontic disease on patients' quality of life and satisfaction. Additionally, a correlation analysis between pain and chewing ability as well as patient's satisfaction and the quality of endodontic treatment has been seen. **Conclusion:** In conclusion, the study shows that the endodontic treatment greatly improved the oral health quality of life of patients in terms of psychological discomfort and physical pain. The correlation between pain and chewing ability shows significant positivity and has proved that endodontic treatment has an impact on patients' oral health and quality life.

**Keywords:** Quality of life, endodontic disease, endodontic treatment, Oral Health Quality of Life (OHQoL), short version of the Malaysian Oral Health Impact Profile (S-OHIP(M) 14, seven semantic differential scales, satisfaction

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### 31. PREVALENCE OF TUMOUR-INFILTRATING LYMPHOCYTES IN SALIVARY GLAND TUMOURS

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**Background:** Tumour infiltrating lymphocytes (TILs), which include T, B, and natural killer (NK) cells within the tumour microenvironment (TME), help to improve traditional tumour risk parameters (TNM staging) by refining an individual risk stratification and thus may improve personalized therapy in the future. **Objectives:** This study investigates the density of CD3+ and CD20+ TILs in pleomorphic adenoma (PA), carcinoma ex-pleomorphic adenoma (CXP) and mucoepidermoid carcinoma (MEC) in the stromal and intra-epithelial tumour compartment. The TILs density in both compartments were then compared between pleomorphic adenoma (PA) and carcinoma ex-pleomorphic adenoma (CXP) and across mucoepidermoid carcinoma grades. **Method:** After considering the inclusion and exclusion criteria, a total of 20 PA, 16 CXP, 20 low-grade MEC, 10 intermediate-grade MEC and 18 high-grade MEC were included. The demographic and clinical data were extracted from biopsy request forms. Three areas with the highest CD3+ and CD20+ TILs densities (hotspot) within stromal and intra-epithelial compartments were digitized (x400 magnification) using an Olympus BX51 microscope and assessed via Olympus Virtual Slide System. The TILs were quantitatively scored, added and rounded for the final mean value of each compartment. Intra- and inter-observer calibration were conducted prior to the actual scoring process. **Results:** In contrast to CXP, PA had significantly higher CD3+ than CD20+ TILs in stromal and intra-epithelial compartments with  $p=0.048$  and  $p=0.006$ , respectively. As for MEC, only intermediate MECs had significantly higher CD3+ TILs in the stromal ( $p=0.048$ ) and intra-epithelial compartments ( $p=0.006$ ). There were no significant differences in CD3+ and CD20+ TIL between PA and CXP and among all MEC grades. Nonetheless, both TILs were higher in the CXP's stromal compartment than in the PA and there was an increasing pattern of CD3+ TIL density but a decreasing pattern of CD20+ TIL density from low to high grades of MEC in the stroma compartment. **Conclusion:** T and B tumour infiltrating lymphocytes distribution in salivary gland neoplasms were heterogeneous in distribution and frequency, which may reflect their distinct roles in tumour microenvironment. Accordingly, the presence of TILs may contains prognostic and predictive value in salivary gland neoplasm which require further exploration for patients benefit in this current immune therapy era.

**Keywords:** Tumour infiltrating lymphocytes, salivary gland tumours, pleomorphic adenoma, carcinoma ex-pleomorphic adenoma, mucoepidermoid carcinoma

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## 32. VALIDATION AND RELIABILITY OF A GUIDED QUESTIONNAIRE (GQ) FOR TYPE 1 DIABETES MELLITUS (T1DM) CHILDREN AND PARENTS ON PERIODONTAL DISEASE (PD)

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**Background:** The prevalence of PD is notably high in individuals with T1DM. Despite this, there is a limited availability of research on the utilization of questionnaires to evaluate self-perceived PD, patient knowledge, and their perception of PD in T1DM patients. Therefore, our objective was to establish validity and reliability of a bilingual (English-Malay) version of the guided questionnaire (GQ) to be used among pediatric T1DM patients attending Universiti Teknologi MARA (UiTM) Sungai Buloh campus and the Universiti Malaya (UM). **Methods:** This questionnaire focused on self-reported periodontal disease (PD), assessing their knowledge, and understanding of the bidirectional relationship between PD and T1DM. The dual-language GQ was adapted from the Self-Reported Questionnaire Malay Modified (SRQMM) to suit the targeted participants. Content validation was carried out among five field experts, and face validation was done among pediatric patients in Dental Faculty UiTM. Reliability testing was administered in T1DM patients attending UiTM and UM. The structure and words of the component in GQ were modified to ensure that it was appropriate for the participants. **Results:** The item-level Content Validity Index (I-CVI) turned out to be valid with an average of 0.98. The subjective measurement of face validation showed satisfactory results after the second revision. Reliability concerning Cronbach's alpha ( $\alpha$ ) values was computed relying on all 21 items, which were acceptable at about 0.777, 0.644, 0.780 in the self-perceived PD assessment domain, knowledge domain and perception domain, respectively. **Conclusion:** Hence, the adapted dual language paediatrics version of the GQ is a reliable and valid tool for assessing self-perceived PD, knowledge, and perception in T1DM patients on PD and it can be effectively utilized by non-dental healthcare personnel.

**Keywords:** Periodontal disease, surveys and questionnaires, type 1 diabetes mellitus, guided questionnaire

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### 33. KNOWLEDGE AND PERCEPTION OF BIDIRECTIONAL RELATIONSHIP BETWEEN PERIODONTAL DISEASE AND TYPE 1 DIABETES MELLITUS: A QUESTIONNAIRE STUDY

*Abidin ZZ, Halim RA, Noor E, Nor NS, Nazari NS, Zaini AA, Azizi NZ, Soelar SA*

**Aim:** The bidirectional relationship between type 1 diabetes mellitus (T1DM) and inflammatory periodontal disease (PD) is globally recognized. However, oral health components are often given lower priority, and studies related to knowledge and the bidirectional association are limited. This study assesses the knowledge and perceptions of PD and its associated risk factors among T1DM patients and/or their parents. **Materials and methods:** Patients under 18 with T1DM at Universiti Teknologi MARA and Universiti Malaya were invited to participate. Structured interviews were conducted to assess participants' knowledge and perceptions of T1DM, and statistical analysis was performed to examine their associations using Pearson's chi-squared test and Fisher's exact test. **Results:** A total of 113 T1DM patients, with a mean age of  $11.4 \pm 4$ , completed the interviews. Poor knowledge was observed among parents and T1DM patients ( $P$ -value = 0.007) and those who exercised regularly ( $P$ -value = 0.047). A significant association with good perception was found among individuals with uncontrolled HbA1c levels ( $P$ -value = 0.0018) and those experiencing bleeding symptoms ( $P$ -value = 0.021). **Conclusions:** The study highlights the importance of increasing awareness, a key factor in improving oral health knowledge. Interestingly, despite poor control of clinical parameters, the population displayed good perception, suggesting a potential lack of understanding regarding disease control.

**Keywords:** Diabetes mellitus, oral health, periodontal disease, self-perception, type 1 diabetes mellitus

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### 34. IMPACT OF THE HABIT OF ALCOHOL CONSUMPTION ON THE SUCCESS OF THE IMPLANTS: A RETROSPECTIVE STUDY

*Bhatia AP, Rupamalini SN, Sathi KV, Marella VG, Pendyala SK, Purohit J, Tiwari RV*

**Introduction:** A recent study has demonstrated that social factors have an impact on the condition of dental implants. The present investigation investigated how varied alcohol intake quantities might alter the condition of dental implants and related peri-implant inflammation. **Materials and methods:** This retrospective research was piloted in a tertiary care center, and implants inserted between 2010 and 2022 were evaluated through a retrospective cohort analysis. Within 3 months following implant implantation, information on alcohol intake was gathered from the health maintenance records and employed as the predictor variable. The implant results as well as peri-implantitis were examined at follow-up visits. Using the logistic regression model, the Wald test analysis analyzed the statistical consequences of each parameter. The findings were translated using an odds ratio that was determined with a 95% confidence level. The data were generated and analyzed using descriptive statistics, with statistical significance defined as  $P < 0.05$ . **Results:** At the time of implant placement, the enrolled patients were  $59 \pm 11.3$  years old on average. The median time before peri-implantitis occurred was  $31.3 \pm 22.2$  months. Within the first 2 years following implant implantation, the majority of people experienced peri-implantitis. The incidence of peri-implantitis was the lowest among light and moderate alcoholics (11.5%) and the highest among heavy alcoholics (46.2%). Moderate alcohol use was associated with a 79.1% decrease in peri-implantitis when compared to not drinking ( $P = 0.0365$ ), whereas light alcohol consumption was connected to a 51.3% decrease ( $P = 0.026$ ). The incidence of peri-implantitis among heavy drinkers was significantly significant ( $P = 0.0001$ ). **Conclusion:** According to the findings of the current retrospective cohort analysis, drinking alcohol at mild-to-moderate levels is connected to a reduction in the incidence rate of peri-implantitis compared to heavy drinkers. In contrast, high alcohol consumption was found to be associated with an increase in the prevalence of peri-implantitis among the participants who had dental implants.

**Keywords:** Alcohol, implant, implant survival, peri-implantitis, retrospective study

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### 35. DISCERNING ORAL LICHEN PLANUS FROM ORAL LICHENOID REACTIONS: A COMPREHENSIVE ANALYSIS OF CLINICAL, HISTOLOGICAL AND MOLECULAR SIGNATURES

*Deshpande A, Rajkumar K, Byatnal A, Pendyala SK, Nagi R, Reddy VS*

**Background:** The complex clinical, histological, and genetic features that differentiate these diseases are explored in this narrative review. The review summarizes recent research with an emphasis on the thorough investigation of these oral mucosal illnesses. **Aim:** Investigating histological, clinical, and molecular markers in detail was the main goal, with a focus on differentiating between oral lichen planus (OLP) and oral lichenoid reaction (OLR). The objective was to present an in-depth understanding of the intricate components that go into the differential diagnosis. **Methodology:** Inclusion criteria which covered material from 2000 to 2023 and focused on English-language studies including human patients with OLP and OLR. A thorough investigation was guaranteed by a methodical search approach using a variety of databases (such as Pubmed Central, Google scholar, Scopus, Web of Science, etc.) and manual searches. MeSH phrases and free-text keywords made it easier to explore the subtleties of histology, clinical, and molecular aspects. **Results:** The results were categorized into molecular markers, histological features, and clinical presentations using thematic data synthesis. A clear and thorough analysis was provided by the qualitative transformation of the synthesized data, which revealed subtle distinctions between OLR and OLP. **Conclusion:** For pathologists, doctors, and researchers negotiating the complex terrain of OLP and OLR, this article is an invaluable resource. It helps improve treatment plans and diagnostic precision for these intricate oral diseases by combining several elements.

**Keywords:** Autoimmune response, molecular profiling, oral mucosal disorders, oral lichen planus, oral lichenoid reactions

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### 36. LASER SURGERY VERSUS NON-LASER SURGERY IN PERIODONTITIS: A COMPARATIVE STUDY

*Rao RM, Roy S, Mondal A, Tate J, Bharath K, Pendyala SK, Pandey P, Tiwari HD*

**Objective:** The purpose of this research is to estimate the effectiveness of non-laser surgery and laser surgery in the management of periodontitis. **Methods:** One hundred participants with a chronic periodontitis diagnosis participated in a randomized controlled experiment. Two cohorts of patients were created: Cohort B underwent non-laser surgery and Cohort A underwent laser surgery. Pre- and postoperative assessments were conducted at 3, 6, and 12 months for clinical criteria such as "pocket depth (PD), gingival index (GI), and clinical attachment level (CAL)". **Results:** There was a noticeable improvement in clinical parameters following both laser and non-laser operations. However, laser surgery showed superior results in terms of decreased PD and raised CAL. **Conclusion:** In conclusion, compared to non-laser surgery, laser surgery seems to be a more successful treatment option for periodontitis. Larger sample sizes and longstanding follow-up are required for future research in order to validate these results and evaluate the longstanding sustainability of the treatment effects.

**Keywords:** Clinical parameters, laser surgery, non-laser surgery, periodontitis, treatment efficacy

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### 37. EVALUATION OF DIFFERENT SUTURING TECHNIQUES IN DEEP THIRD MOLAR SURGERY: AN ORIGINAL RESEARCH

*Baig FAH, Beniwal SK, Samir PV, Venkateshwar G, Singh M, Pendyala SK*

**Purpose:** The purpose of this study was to compare the efficacy of various suturing methods used in deep third molar extraction procedures. **Methods:** A total of four suturing method groups-simple interrupted, horizontal mattress, vertical mattress, and figure-of-eight-were randomly allocated to 100 patients having deep third molar surgery. Assessments were conducted on wound healing, operation time, intraoperative problems, postoperative pain scores, swelling measures, and patient satisfaction questionnaires. Appropriate tests were used for statistical analysis, with  $P < 0.05$  being regarded as significant. **Results:** Compared to other procedures, the figure-of-eight technique showed better results in terms of postoperative pain scores, swelling measures, wound healing percentages, and patient satisfaction ( $P < 0.05$ ). There was no discernible difference in the operating time or intraoperative problems between the groups. **Conclusion:** In conclusion, there seems to be a benefit to using the figure-of-eight suturing approach for deep third molar surgery in terms of improved postoperative results and patient satisfaction. It is recommended that clinicians give this strategy some thought to improve patient care and surgical results.

**Keywords:** Edema, postoperative discomfort, suturing procedures, third molar surgery, wound healing

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### 38. ASSESSMENT OF THE EFFICACY OF TMJ ARTHROSCOPY-ASSISTED MASSETER NERVE AVULSION ON HEMIMASTICATORY SPASM: AN ORIGINAL RESEARCH

Pillai AR, Kumar GJ, Kumar P, Nizar SA, Pendyala SK, Baig FAH

**Introductions:** The goal of this study is to find a cure for the masticatory muscle disease known as hemimasticatory spasm (HMS). This retrospective investigation intends to find a more efficient therapeutic approach for HMS patients by examining the clinical effectiveness of masseteric nerve avulsion performed on HMS using a temporomandibular arthroscope. **Methods:** A clinical study was piloted where the subjects were treated for masseter nerve avulsion by TMJ arthroscopy. The follow-up was done till 2 years, and the subjects were evaluated for the various characteristics like difficulties, masticatory abilities, and various sounds at the joint for the various functions of the joint. The diagnosis was done using the electrophysiological electromyogram (EMG) at the designated time intervals. **Results:** There was a complete remission in all the subjects. The masseter nerve avulsion was effective since the scores lowered. Within 3 years of the operation, electrophysiological EMG depicted no discharge potential with a high frequency, and the total efficiency when paired with the clinical effectiveness was deemed acceptable. The maximal masseter power between the treated and nontreated sides was comparable. The mastication, on comparing, was also as effective as the normal side; however, lower mastication was noted in the first year. The avulsed nerve tissues lacked any apparent demyelination. Masseteric nerve avulsion with temporomandibular arthroscope assistance provided acceptable and stable total effectiveness for the intervention of the hemimasticatory spasm. **Conclusion:** While the strength of the muscle of the afflicted side was only marginally reduced, its masticatory effectiveness was optimally preserved.

**Keywords:** Arthroscopy, hemimasticatory spasm, temporomandibular

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### 39. PARENTAL KNOWLEDGE, PRACTICE AND AWARENESS ON FEEDING AND ORAL HYGIENE MEASURES FOR THEIR CHILDREN: AN IMPACT ON ICDAS SCORES

*Raveendran ND, Ng CS, Ng SH, Cugati N, Ganapathy S*

**Introduction:** Early childhood caries is one of the most prevalent chronic dental disorders affecting children in their early developmental stages. The negative consequence of caries would impact the child's overall quality of life. The mother or other primary caregiver is ultimately responsible for making the decisions concerning a child's nutrition, upbringing, and care in order to promote good health and impart healthy habits in them. **Aims and methodology:** To investigate the knowledge and awareness of parents towards the child's feeding, oral hygiene practices and its impact on the dental tissues in the oral cavity represented using the ICDAS scores. In phase I a preformed closed ended questionnaire in Malay language was distributed to 100 parents that recorded the Knowledge, practices and awareness of parent's feeding and oral hygiene measures followed in their children. In Phase II their kids were examined at to record the ICDAS scores. **Results:** The parameters in the parent's questionnaire form and the ICDAS scores of the deciduous and young permanent molars in the children were tabulated and statistically analyzed by using Spss software. There was ambiguity among the parent's knowledge, awareness and practice of feeding and oral hygiene methods they followed for their children. Besides, there was statistical significance difference in the molar teeth affected by caries and their ICDAS scores ( $p < 0.001$ ) in the subjects upon clinical examination. **Conclusion:** The clinical outcomes for treatment of early childhood caries are not always favorable with high relapse. Hence, this study recommends to investigate the cultural norms that are associated with knowledge, practice and attitude of feeding and oral hygiene practices followed in community and modify their practices in a wise and strategical trajectories to promote health, thereby reducing the burden of oral health in the society.

**Keywords:** Early childhood caries, feeding practices, ICDAS, dental health knowledge, attitudes, practice, attitude caretakers

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#### 40. LONGITUDINAL STUDY OF ORAL PRECANCEROUS LESIONS: TRANSFORMATION RATE AND PREDICTIVE MARKERS FOR MALIGNANCY

*Das D, Issac AS, Sangala BN, Jerry A, Jankar A, Jain T, Singh RK*

**Background:** One of the main risk factors for the occurrence of oral cancer is oral precancerous lesions (OPLs). Early management and preventive efforts depend on knowing the transformation rate and detecting predictive signs of malignancy. **Methods:** For 6 months, a group of 200 individuals with clinically diagnosed OPLs was followed up on in this longitudinal research. To examine biomarker expression levels and describe the lesions, examinations using immunohistochemistry, histopathology, and clinical methods were carried out. **Findings:** Over the course of 2 years, 200 patients with OPLs were monitored in this study. Most lesions had mild dysplasia, according to histopathological examination. The expression of many biomarkers that were correlated with the dysplasia grade were p53 (60.0%), Ki-67 (40.0%), CDKN2A (30.0%), and epidermal growth factor receptor (EGFR) (25.0%). **Conclusion:** In summary, this study emphasizes how crucial it is to provide patients with OPLs with individualized care plans and routine surveillance. Certain biomarkers, such as EGFR, Ki-67, and p53, can be useful prognostic markers for identifying malignant transformation. To confirm these results and create tailored therapies for high-risk patients, more study is necessary.

**Keywords:** Longitudinal study, malignancy, oral precancerous lesions, predictive indicators, transformation rate

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#### 41. CORRELATION OF PREGNANT ORAL HEALTH SCORING MODELS WITH INFLAMMATORY PROTEIN MARKERS SCD14 AND PROSTAGLANDINS

*Suwargiani AA, Aripin D, Arief EM, Widyaputra S, Susilawati S, Kadir RA*

**Background:** To analyse correlation of pregnant oral health scoring model with inflammatory protein markers sCD14 and prostaglandins. **Method:** A cross-sectional consisted of 80 pregnant women who met inclusion criteria used consecutive sampling. **Result:** The POSC-p model which was based on oral health scoring, components of salivary condition was significantly correlated with sCD14 and the POSC-p model and combined of oral health scoring was significantly correlated with prostaglandins. **Conclusion:** The POSC-p score model and the sCD14 of clinical examination have correlation consist of tooth decay, occlusion and salivary condition consist of salivary pH level, salivary volume and salivary buffer. However, there was no substantial correlation between the pregnant oral health scoring model of felt need and the pregnant oral health scoring for salivary conditions or the combined POSC-p score and sCD14 levels and POSC-p Scores (combined) significant correlation with sCD14

**Keywords:** Pregnant, oral health, scoring, selfcare, inflammatory, protein marker, sCD14, Prostaglandin

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## 42. COMPARISON OF THE EFFECTIVENESS OF MORUS ALBA AND CHLORHEXIDINE GELS AS AN ADJUNCT TO SCALING AND ROOT PLANING ON STAGE II PERIODONTITIS – A RANDOMIZED CONTROLLED CLINICAL TRIAL

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**Objectives:** The present study aimed to assess and compare the effect of Morus alba and chlorhexidine gel as an adjunct to scaling and root planing (SRP) in treating stage II periodontitis. **Methods:** A single-blind, randomized controlled trial was conducted on 180 patients with stage II periodontitis who received full-mouth SRP. They were randomly assigned to receive chlorhexidine digluconate (CHX) gel, Morus alba (MA) and placebo gel for Groups A, B and C, respectively, at the baseline, 15 days and 30 days. Plaque index (PI), Gingival index (GI), periodontal pocket depth (PPD) and quantitative analysis (culture) of *Aggregatibacter actinomycetemcomitans*, *Porphyromonas gingivalis* and *Tannerella forsythia* were assessed at baseline and 45 days. Analysis of variance was used to compare the significant difference in PI, GI, PPD and microbiological parameters between the three groups after the intervention, followed by post hoc Mann–Whitney U and Tukey's HSD test for clinical and microbiological parameters, respectively. **Results:** Intergroup comparison of the PI, GI and microbiological parameters between the MA and CHX groups at the end of 45 days did not show a statistically significant difference ( $p > 0.05$ ), whereas a statistically significant difference was observed for PPD between MA and CHX groups with the mean difference of 0.18 mm ( $p = 0.002$ ). **Conclusion:** Morus alba gel was found to be effective in decreasing PPD. However, there was no difference between Morus alba and chlorhexidine gel as an adjunct to SRP in treating stage II periodontitis.

**Keywords:** Chlorhexidine, chronic periodontitis, herbal medicine, root planing

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### 43. PHOTOBIMODULATION THERAPY IN THE MANAGEMENT OF ORAL LICHEN PLANUS: A SYSTEMATIC REVIEW AND META-ANALYSIS

*Soh WK, Cheah KF, Veettil SK, Pandiar D, Nimbalkar S, Gopinath D*

**Introduction:** Photobiomodulation therapy (PBMT) is a non-invasive and the latest form of therapy used in the treatment of non oncological diseases as well as cancers of various types and locations. The aim of this study was to systematically review and assess the efficacy of PBMT in managing oral lichen planus (OLP) compared to the interventions. **Methods:** A systematic review and meta-analysis were implemented according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. An electronic search using PubMed, Scopus, and Cochrane was conducted to retrieve relevant studies published until June 2023. The outcomes evaluated included the reduction in pain score and clinical severity scores (Prospero No CRD42023428626). **Results:** A total of eight studies were identified for qualitative synthesis. The pooled analysis incorporating six studies revealed that there are no significant differences for both mean pain score (mean difference [MD] = 0.21, 95% confidence interval [CI] = -0.51, 0.93) as well as clinical score (MD = -0.08, 95% CI = -0.4, 0.25) between PBMT and comparison groups. Subgroup analysis based on corticosteroids as controls showed that there was no significant difference in mean reduction in pain score between PBMT and topical steroids (MD = 0.38, 95% CI = -0.54, 1.31). **Conclusion:** PBMT is as effective as other interventions in the treatment of OLP, though not superior, and can be a promising alternative treatment for cases resistant to steroids or when steroids are contraindicated. Further studies are recommended to standardize the optimal settings for the treatment of OLP.

**Keywords:** Photobiomodulation therapy, oral potentially malignant disorder, lichen planus, OLP, low-level laser therapy

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#### 44. CRESTAL STRAIN OF TWO-IMPLANT MANDIBULAR OVERDENTURES WITH IMPLANTS PLACED AT DIFFERENT POSITIONS: AN IN VITRO 3D PRINTED SIMULATION STUDY

Patil PG, Seow LL, Uddanwadikar R, Pau A, Ukey PD

**Statement of problem:** The 2-implant mandibular overdenture (2IMO) is a popular treatment for patients with mandibular edentulism. However, information on the influence of implant positions on crestal strain is lacking. **Purpose:** The purpose of this in vitro study was to evaluate the crestal strain around 2 implants to support mandibular overdentures when placed at different positions. **Material and methods:** Edentulous mandibles were 3-dimensionally (3D) designed separately with 2 holes for implant placement at similar distances of 5, 10, 15, and 20 mm from the midline, resulting in 4 study conditions. The complete denture models were 3D designed and printed from digital imaging and communications in medicine (DICOM) images after scanning the patient's denture. Two 4.3×12-mm dummy implants were placed in the preplanned holes. Two linear strain gauges were attached on the crest of the mesial and distal side of each implant (CH1, CH2, CH3, and CH4) and connected to a computer to record the electrical signals. Male LOCATOR attachments were attached, the mucosal layer simulated, and the denture picked up with pink female nylon caps. A unilateral and bilateral force of 100 N was maintained for 10 seconds for each model in a universal testing machine while recording the maximum strains in the DCS-100A KYOWA computer software program. Data were analyzed by using 1-way analysis of variance, the Tukey post hoc test, and the paired t test ( $\alpha=.05$ ). **Results:** Under bilateral loading, the strain values indicated a trend with increasing distance between the implants with both right and left distal strain gauges (CH4 and CH1). The negative (-ve) values indicated the compressive force, and the positive (+ve) values indicated the tensile force being applied on the strain gauges. The strain values for CH4 ranged between -166.08 for the 5-mm and -251.58 for the 20-mm position; and for CH1 between -168.08 for the 5-mm and -297.83 for the 20-mm position. The remaining 2 mesial strain gauges for all 4 implant positions remained lower than for CH4 and CH1. Under unilateral-right loading, only the right-side distal strain gauge CH4 indicated the increasing trend in the strain values with -147.5 for the 5-mm, -157.17 for the 10-mm, -209.33 for the 15-mm, and -234.75 for the 20 mm position. The remaining 3 strain gauges CH3, CH2, and CH1 ranged between -28.33 and -107.17. For each position for both implants, significantly higher ( $P<.05$ ) strain values were observed on the distal strain gauge channels CH4 and CH1 than on the mesial channels CH3 and CH2 under bilateral loading and on the right side under unilateral loading. **Conclusions:** Peri-implant crestal strains in the 2IMO increased by increasing the distance of the implants from the midline. The stress values progressively increased from 5 to 10 mm to 15 to 20 mm from midline, represented as lateral incisor, canine, and premolar positions. The distal side of the implants exhibits higher strains than the mesial side of the implants.

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## 45. IMMEDIATE IMPLANT PLACEMENT AND SIMULTANEOUS BONE GRAFTING WITH BONE CEMENT IN EXTRACTION SOCKETS: A SYSTEMATIC REVIEW

*Chaubal TV, Yeoh WC, Phua CKS, Bapat R, Pulikkotil SJ*

**Background:** The placement of immediate dental implants intrinsically displays crestal gaps, which may compromise implant osseointegration. Several grafting materials have been used to overcome this issue. Of the available materials, the use of bone cement is relatively new in oral implantology. This study aimed to examine the available literature on the utilization of bone cements in immediate placement of dental implants and assess its potential in oral implantology. **Objectives:** To synthesize evidence for appraising the impact of bone cements on implant stability and bone-to-implant contact (BIC) of dental implants placed immediately after extraction in humans and animals after 3 months of healing from tooth extraction. **Methods:** A systematic search was conducted in PubMed, Medline, and ScienceDirect for relevant studies published from inception to September 2021 using relevant search terms. Of the 1624 studies, 4 were selected for this systematic review. **Results:** Three of the four studies concluded that bone cements enhanced implant stability and/or BIC with better quality and/or quantity of bone surrounding the immediate dental implant. The conclusion drawn by one article remained indecisive. Meta-analysis could not be performed owing to the presence of substantial heterogeneity. **Conclusion:** Bone cement is a promising treatment alternative as it augments implant stability and/or BIC in immediate dental implants. Nonetheless, further prospective human clinical trials are required to establish its clinical effectiveness and arrive at a definitive conclusion to recommend its clinical use.

**Keywords:** Bone cement, bone grafting, extraction sockets, immediate implant, systematic review

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#### 46. AN ASSESSMENT OF ORAL CANCER KNOWLEDGE, ATTITUDES, AND PRACTICES AMONG UNDERGRADUATE STUDENTS IN MALAYSIAN DENTAL SCHOOLS

*Chan ZW, Phuan YF, Ooi PY, Nor Azmi N, Pateel DG, Yap HY, Gunjal S*

**Background:** Oral cancer is a significant public health concern worldwide. Early detection and prevention are crucial in reducing the morbidity and mortality rates associated with this disease. As future dental professionals, dental undergraduates play a vital role in promoting oral health and identifying potential oral cancer cases. **Methods:** This study aimed to evaluate the level of oral cancer awareness, knowledge, attitudes, and practices among dental undergraduates in Malaysia. A total of 595 students from years 3, 4, and 5 in both public and private universities participated. **Results:** The results showed that a higher percentage of dental undergraduates from private universities were aware of oral cancer and had satisfactory knowledge compared to those from public universities ( $p < 0.05$ ). Moreover, 59.4% of respondents felt less confident in diagnosing oral cancer during routine dental practice, and 96.1% agreed on the need to increase public awareness of oral health. Interestingly, students from private universities exhibited higher levels of awareness and knowledge regarding oral cancer than those from public universities. **Conclusions:** To enhance oral cancer detection and prevention, it is essential to reinforce the current curriculum and provide training to improve diagnostic skills for every dental undergraduate. This will ensure that they are well-equipped with the necessary knowledge and competence to detect and prevent oral cancer effectively.

**Keywords:** Attitude, dental undergraduates, knowledge, oral cancer, practices

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#### 47. NICOTINE DEPENDENCE AND ASSOCIATED FACTORS AMONG PERSONS WHO USE ELECTRONIC E-CIGARETTES IN MALAYSIA-AN ONLINE SURVEY

*Sreeramareddy CT, Shroff SM, Gunjal S*

**Background:** Nicotine dependence, factors associated with dependence, and self-reported side effects among people who use e-cigarettes are scarce in developing countries. **Methods:** A sample of 302 persons who currently use e-cigarettes was recruited from discussion forums on Reddit, Facebook, and the forum 'lowyat'. The online Google form survey collected data on demographics, e-cigarette use, and the reasons, for cigarette smoking, Fagerstorm Test for Nicotine Dependence adapted for e-cigarettes (eFTND), and side effects experienced. **Results:** The mean age was 25.5 years (6.5), 60.6% were males and 86% had higher education. About 47% were using e-cigarettes only, 27.8% were currently using dual products (both electronic and conventional cigarettes), and 25.2% had also smoked cigarettes in the past. 'Less harmful than cigarettes' (56.3%), 'because I enjoy it' (46.7%), and 'it has a variety of flavors (40.4%) were the common reasons for e-cigarette use. The mean eFTND score was 3.9 (SD = 2.2), with a median of four side effects (IQR 3-6), sore or dry mouth/throat (41.4%), cough 33.4%, headache (20.5%), dizziness (16.2%) were commonly reported side effects. eFTND score and side effects were higher among persons using dual products. By multiple linear regression analysis, males ( $\beta = 0.56$  95% CI 0.45, 1.05,  $p = 0.033$ ), dual-use ( $\beta = 0.95$  95% CI 0.34, 1.56,  $p < 0.003$ ), and use of nicotine-containing e-cigarettes ( $\beta = 0.66$  95% CI 0.07, 1.25  $p = 0.024$ ) had higher eFTND score. **Conclusion:** Our findings of the study call for the placement of disclaimers about possible nicotine addiction and side effects of e-cigarette products.

**Keywords:** Dependence, electronic cigarettes, epidemiology, nicotine, side effects

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#### 48. PAIN PERCEPTION, KNOWLEDGE, ATTITUDE, AND DIET DIVERSITY IN PATIENTS UNDERGOING FIXED ORTHODONTIC TREATMENT: A PILOT STUDY

*Mok E, Rahman US, Misra S, Saxena K*

**Objective:** This study aimed to determine the correlation between pain perception and knowledge, attitude, and diet diversity in patients undergoing fixed orthodontic treatment. **Methods:** A total of 103 patients (15-40 yrs.; 67 females, 36 males) undergoing orthodontic treatment with a 0.022-inch slot (MBT prescription) in both arches were recruited. Information on pain perception, knowledge, attitude, and diet diversity scores was collected through validated questionnaires using visual analogue scale and close-ended questions at one time point. The correlation between variables was analyzed using the Pearson's correlation coefficient. **Results:** Of the patients, 48.5% were aged 15 to 19 years old, with 65% females and 73.8% of Chinese ethnicity. Approximately 90% of the orthodontic patients perceived low levels of pain from orthodontic treatment, and 98% had a positive attitude toward orthodontic treatment. The patients had a good level of knowledge (Mean:  $6 \pm 0.65$ ). Approximately 49.5% of patients reported having moderate diet diversity. No significant correlation was found between pain perception and knowledge, or pain perception and diet diversity ( $r=0.062$ ,  $p=0.534$ ). However, a significant weak negative correlation ( $r=-0.289$ ,  $p<0.05$ ) between pain perception and attitude was observed. **Conclusion:** Patients undergoing fixed orthodontic treatment presented with overall low pain perception, a positive attitude, and good knowledge about their treatment with moderate diet diversity. Informing the patient in advance about different orthodontic procedures encourages a positive attitude and facilitates patient cooperation. An interprofessional approach involving nutritionists can provide a holistic patient approach during orthodontic treatment.

**Keywords:** Pain perception, attitude, diet, fixed orthodontic appliance, knowledge

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#### 49. STATUS KESIHATAN PERGIGIAN MURID-MURID 12 TAHUN SK ABANG ABDUL KADIR, BAHAGIAN BETONG, SARAWAK (KLINIK PERGIGIAN SEKOLAH) 2018 - 2023

*Berauh S, Kanyong L, Wan Aziz WNA, Wong ST*

**Pengenalan:** Karies gigi merupakan penyakit tidak berjangkit yang paling lazim walaupun penyakit tersebut boleh dicegah dan dirawat. Secara umumnya, tahap kesihatan pergigian murid sekolah di Bahagian Betong, Sarawak adalah kurang memuaskan. Setakat ini, tiada kajian dijalankan untuk mengenalpasti status kesihatan pergigian murid-murid SK Abang Abdul Kadir, Betong. **Objektif:** Objektif kajian ini adalah untuk mengukur prevalens karies, pengalaman karies dan keperluan rawatan karies bagi murid-murid 12 tahun di SK Abang Abdul Kadir, Betong. **Kaedah Kajian:** Kajian keratan rentas ini melibatkan semua murid 12 tahun di bawah Program Pergigian Inkremental Kementerian Kesihatan Malaysia dari tahun 2018 sehingga 2023 kecuali 2020 dan 2021. Pemeriksa merupakan Juruterapi Pergigian yang telah dilatih dalam penggunaan indeks DMFT (decayed, missing and filled teeth), piawaian Pertubuhan Kesihatan Sedunia (WHO). **Keputusan Kajian:** Prevalens karies di kalangan empat kohort murid 12 tahun di SK Abang Abdul Kadir, Betong menunjukkan penurunan daripada 40.3% (2018) ke 38.8% (2023). Bagi pengalaman karies (purata DMFT) dan keperluan rawatan karies (purata D), keputusan kajian masing-masing menggambarkan penurunan yang perlahan, iaitu daripada 0.98 (2018) ke 0.91 (2023); dan tren peningkatan daripada 0.29 (2018) ke 0.95 (2022) dan seterusnya penurunan yang ketara ke 0.36 (2023). Untuk murid Tahun 1 (Kohort 2018), prevalens karies menunjukkan peningkatan daripada 5.1% (Tahun 1, 2018) ke 34.8% (Tahun 6, 2023). Pengalaman karies (purata DMFT) dan keperluan rawatan karies (purata D) pula masing-masing memaparkan peningkatan daripada 0.07 (Tahun 1, 2018) ke 0.88 (Tahun 6, 2023); dan kenaikan ketara daripada 0.00 (Tahun 1, 2018) ke 0.50 (Tahun 6, 2023). **Kesimpulan:** Secara keseluruhan, status kesihatan pergigian murid-murid 12 tahun di SK Abang Abdul Kadir, Betong boleh diperbaiki supaya setanding dengan pencapaian peringkat kebangsaan.

**Kata-kata Kunci:** Karies gigi, purata DMFT, Betong, Sarawak

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## 50. STATUS KESIHATAN PERGIGIAN MURID-MURID 12 TAHUN SK ABG ABDUL RAHMAN, BAHAGIAN BETONG, SARAWAK (KLINIK PERGIGIAN SEKOLAH) 2018 - 2023

*Dana L, Kanyong L, Wan Aziz WNA, Wong ST*

**Pengenalan:** Karies gigi merupakan penyakit tidak berjangkit yang paling lazim walaupun penyakit tersebut boleh dicegah dan dirawat. Secara umumnya, tahap kesihatan pergigian murid sekolah di Bahagian Betong, Sarawak adalah kurang memuaskan. Setakat ini, tiada kajian dijalankan untuk mengenalpasti status kesihatan pergigian murid-murid SK Abg Abdul Rahman, Betong. **Objektif:** Objektif kajian ini adalah untuk mengukur prevalens karies, pengalaman karies dan keperluan rawatan karies bagi murid-murid 12 tahun di SK Abg Abdul Rahman, Betong. **Kaedah Kajian:** Kajian keratan rentas ini melibatkan semua murid 12 tahun di bawah Program Pergigian Inkremental Kementerian Kesihatan Malaysia dari tahun 2018 sehingga 2023 kecuali 2020 dan 2021. Pemeriksa merupakan Juruterapi Pergigian yang telah dilatih dalam penggunaan indeks DMFT (decayed, missing and filled teeth), piawaian Pertubuhan Kesihatan Sedunia (WHO). **Keputusan Kajian:** Prevalens karies di kalangan empat kohort murid 12 tahun di SK Abg Abdul Rahman, Betong menunjukkan peningkatan daripada 33.3% (2018) ke 41.4% (2023). Bagi pengalaman karies (purata DMFT) dan keperluan rawatan karies (purata D), keputusan kajian masing-masing menggambarkan peningkatan, iaitu daripada 0.91 (2018) ke 1.23 (2023); dan dalam julat 0.30 hingga 0.60 di antara 2018 dan 2023. Untuk murid Tahun 1 (Kohort 2018), prevalens karies menunjukkan peningkatan daripada 13.3% (Tahun 1, 2018) ke 41.4% (Tahun 6, 2023). Pengalaman karies (purata DMFT) dan keperluan rawatan karies (purata D) pula masing-masing memaparkan peningkatan daripada 0.39 (Tahun 1, 2018) ke 1.23 (Tahun 6, 2023); dan kenaikan perlahan 0.34 (Tahun 1, 2018) ke 0.39 (Tahun 6, 2023). **Kesimpulan:** Secara keseluruhan, status kesihatan pergigian murid-murid 12 tahun di SK Abg Abdul Rahman, Betong boleh diperbaiki supaya setanding dengan pencapaian peringkat kebangsaan.

**Kata-kata Kunci:** Karies gigi, purata DMFT, Betong, Sarawak

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## 51. STATUS KESIHATAN PERGIGIAN MURID-MURID 12 TAHUN SJK(C) CHUNG HUA ROBAN, BAHAGIAN BETONG, SARAWAK (PASUKAN PERGIGIAN BERGERAK) 2018 - 2023

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**Pengenalan:** Karies gigi merupakan penyakit tidak berjangkit yang paling lazim walaupun penyakit tersebut boleh dicegah dan dirawat. Secara umumnya, tahap kesihatan pergigian murid sekolah di Bahagian Betong, Sarawak adalah kurang memuaskan. Setakat ini, tiada kajian dijalankan untuk mengenalpasti status kesihatan pergigian murid-murid SJK(C) Chung Hua Roban, Betong. **Objektif:** Objektif kajian ini adalah untuk mengukur prevalens karies, pengalaman karies dan keperluan rawatan karies bagi murid-murid 12 tahun di SJK(C) Chung Hua Roban, Betong. **Kaedah Kajian:** Kajian keratan rentas ini melibatkan semua murid 12 tahun di bawah Program Pergigian Inkremental Kementerian Kesihatan Malaysia dari tahun 2018 sehingga 2023 kecuali 2020 dan 2021. Pemeriksa merupakan Juruterapi Pergigian yang telah dilatih dalam penggunaan indeks DMFT (decayed, missing and filled teeth), piawaian Pertubuhan Kesihatan Sedunia (WHO). **Keputusan Kajian:** Prevalens karies di kalangan empat kohort murid 12 tahun di SJK(C) Chung Hua Roban, Betong menunjukkan penurunan yang ketara daripada 46.4% (2018) ke 15.4% (2023). Bagi pengalaman karies (purata DMFT) dan keperluan rawatan karies (purata D), keputusan kajian masing-masing menggambarkan penurunan yang tinggi, iaitu daripada 0.89 (2018) ke 0.31 (2023); dan penurunan ketara daripada 0.22 (2018) ke 0.04 (2023). Untuk murid Tahun 1 (Kohort 2018), prevalens karies menunjukkan peningkatan daripada 0.00% (Tahun 1, 2018) ke 15.4% (Tahun 6, 2023). Pengalaman karies (purata DMFT) dan keperluan rawatan karies (purata D) pula masing-masing memaparkan peningkatan daripada 0.00 (Tahun 1, 2018) ke 0.31 (Tahun 6, 2023); dan kenaikan ketara daripada 0.00 (Tahun 1, 2018) ke 0.37 (Tahun 5, 2022), dan seterusnya merundum ke 0.04 (Tahun 6, 2023). **Kesimpulan:** Secara keseluruhan, status kesihatan pergigian murid-murid 12 tahun di SJK(C) Chung Hua Roban, Betong boleh diperbaiki supaya setanding dengan pencapaian peringkat kebangsaan.

**Kata-kata Kunci:** Karies gigi, purata DMFT, Betong, Sarawak

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## 52. STATUS KESIHATAN PERGIGIAN MURID-MURID 12 TAHUN SJK CHUNG HUA, BAHAGIAN BINTULU, SARAWAK (KLINIK PERGIGIAN SEKOLAH) 2018 – 2023

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**Pengenalan:** Karies gigi merupakan penyakit tidak berjangkit yang paling lazim walaupun penyakit tersebut boleh dicegah dan dirawat. Secara umumnya, tahap kesihatan pergigian murid sekolah di Bahagian Bintulu, Sarawak adalah kurang memuaskan. Setakat ini, tiada kajian dijalankan untuk mengenalpasti status kesihatan pergigian murid-murid SJK Chung Hua, Bintulu. **Objektif:** Objektif kajian ini adalah untuk mengukur prevalens karies, pengalaman karies dan keperluan rawatan karies bagi murid-murid 12 tahun di SJK Chung Hua, Bintulu. **Kaedah Kajian:** Kajian keratan rentas ini melibatkan semua murid 12 tahun di bawah Program Pergigian Inkremental Kementerian Kesihatan Malaysia dari tahun 2018 sehingga 2023 kecuali 2020 dan 2021. Pemeriksa merupakan Juruterapi Pergigian yang telah dilatih dalam penggunaan indeks DMFT (decayed, missing and filled teeth), piawaian Pertubuhan Kesihatan Sedunia (WHO). **Keputusan Kajian:** Prevalens karies di kalangan empat kohort murid-murid 12 tahun di SJK Chung Hua, Bintulu menunjukkan peningkatan daripada 40.6% (2018) ke 48.7% (2023). Bagi pengalaman karies (purata DMFT) dan keperluan rawatan karies (purata D), keputusan kajian masing-masing menggambarkan peningkatan, iaitu daripada 0.90 (2018) ke 1.24 (2023); dan dalam julat 0.22 dan 0.72 antara 2019 sehingga 2023. Untuk murid Tahun 1 (Kohort 2018), prevalens karies menunjukkan peningkatan daripada 2.9% (Tahun 1, 2018) ke 43.4% (Tahun 6, 2023). Pengalaman karies (purata DMFT) dan keperluan rawatan karies (purata D) pula masing-masing memaparkan peningkatan ketara daripada 0.04 (Tahun 1, 2018) ke 1.24 (Tahun 6, 2023); dan kenaikan ketara daripada 0.05 (Tahun 1, 2018) ke 0.35 (Tahun 6, 2023). **Kesimpulan:** Secara keseluruhan, status kesihatan pergigian murid-murid 12 tahun di SJK Chung Hua, Bintulu boleh diperbaiki supaya setanding dengan pencapaian peringkat kebangsaan.

**Kata-kata Kunci:** Karies gigi, purata DMFT, Bintulu, Sarawak

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### 53. STATUS KESIHATAN PERGIGIAN MURID-MURID 12 TAHUN SK KAMPUNG JEPAK, BAHAGIAN BINTULU, SARAWAK (PASUKAN PERGIGIAN BERGERAK) 2018 – 2023

*Morshidi F, Huang MM, Goh ES, Wong ST*

**Pengenalan:** Karies gigi merupakan penyakit tidak berjangkit yang paling lazim walaupun penyakit tersebut boleh dicegah dan dirawat. Secara umumnya, tahap kesihatan pergigian murid sekolah di Bahagian Bintulu, Sarawak adalah kurang memuaskan. Setakat ini, tiada kajian dijalankan untuk mengenalpasti status kesihatan pergigian murid-murid SK Kampung Jepak, Bintulu. **Objektif:** Objektif kajian ini adalah untuk mengukur prevalens karies, pengalaman karies dan keperluan rawatan karies bagi murid-murid 12 tahun di SK Kampung Jepak, Bintulu. **Kaedah Kajian:** Kajian keratan rentas ini melibatkan semua murid 12 tahun di bawah Program Pergigian Inkremental Kementerian Kesihatan Malaysia dari tahun 2018 sehingga 2023 kecuali 2020 dan 2021. Pemeriksa merupakan Juruterapi Pergigian yang telah dilatih dalam penggunaan indeks DMFT (decayed, missing and filled teeth), piawaian Pertubuhan Kesihatan Sedunia (WHO). **Keputusan Kajian:** Prevalens karies di kalangan empat kohort murid 12 tahun di SK Kampung Jepak, Bintulu menunjukkan peningkatan daripada 39.8% (2018) ke 48.5% (2023). Bagi pengalaman karies (purata DMFT) dan keperluan rawatan karies (purata D), keputusan kajian masing-masing menggambarkan peningkatan, iaitu daripada 1.00 (2018) ke 1.19 (2023); dan kenaikan daripada 0.35 (2018) ke 0.49 (2023). Untuk murid Tahun 1 (Kohort 2018), prevalens karies menunjukkan peningkatan daripada 3.7% (Tahun 1, 2018) ke 48.5% (Tahun 6, 2023). Pengalaman karies (purata DMFT) dan keperluan rawatan karies (purata D) pula masing-masing memaparkan peningkatan ketara daripada 0.07 (Tahun 1, 2018) ke 1.19 (Tahun 6, 2023); dan kenaikan ketara daripada 0.06 (Tahun 1, 2018) ke 0.49 (Tahun 6, 2023). **Kesimpulan:** Secara keseluruhan, status kesihatan pergigian murid-murid 12 tahun di SK Kampung Jepak, Bintulu boleh diperbaiki supaya setanding dengan pencapaian peringkat kebangsaan.

**Kata-kata Kunci:** Karies gigi, purata DMFT, Bintulu, Sarawak

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#### 54. STATUS KESIHATAN PERGIGIAN MURID-MURID 12 TAHUN SK LUSONG LAKU, BAHAGIAN KAPIT, SARAWAK (PASUKAN PERGIGIAN BERGERAK) 2018 – 2023

*Siang S, Ibrahim H, Ngin WC, Wong ST*

**Pengenalan:** Karies gigi merupakan penyakit tidak berjangkit yang paling lazim walaupun penyakit tersebut boleh dicegah dan dirawat. Secara umumnya, tahap kesihatan pergigian murid sekolah di Bahagian Kapit, Sarawak adalah kurang memuaskan. Setakat ini, tiada kajian dijalankan untuk mengenalpasti status kesihatan pergigian murid-murid SK Lusong Laku, Daerah Belaga, Bahagian Kapit. **Objektif:** Objektif kajian ini adalah untuk mengukur prevalens karies, pengalaman karies dan keperluan rawatan karies bagi murid-murid 12 tahun di SK Lusong Laku, Kapit. **Kaedah Kajian:** Kajian keratan rentas ini melibatkan semua murid 12 tahun di bawah Program Pergigian Inkremental Kementerian Kesihatan Malaysiadari tahun 2018 sehingga 2023 kecuali 2020 dan 2021. Pemeriksa merupakan Juruterapi Pergigian yang telah dilatih dalam penggunaan indeks DMFT (decayed, missing and filled teeth), piawaian Pertubuhan Kesihatan Sedunia (WHO). **Keputusan Kajian:** Prevalens karies di kalangan empat kohot murid 12 tahun di SK Lusong Laku, Kapit menunjukkan penurunan yang perlahan daripada 85.8% (2018) ke 81.8% (2023). Bagi pengalaman karies (purata DMFT) dan keperluan rawatan karies (purata D), keputusan kajian masing-masing menggambarkan peningkatan, iaitu daripada 1.79 (2018) ke 2.55 (2023); dan kenaikan daripada 0.64 (2018) ke 1.19 (2023). Untuk murid Tahun 1 (Kohot 2018), prevalens karies menunjukkan peningkatan daripada 22.2% (Tahun 1, 2018) ke 81.8% (Tahun 6, 2023). Pengalaman karies (purata DMFT) dan keperluan rawatan karies (purata D) pula masing-masing memaparkan peningkatan ketara daripada 0.22 (Tahun 1, 2018) ke 2.25 (Tahun 6, 2023), iaitu sebanyak 10 kali ganda; dan kenaikan ketara daripada 0.22 (Tahun 1, 2018) ke 1.91 (Tahun 6, 2023), kira-kira 10 kali ganda juga. **Kesimpulan:** Secara keseluruhan, status kesihatan pergigian murid-murid 12 tahun di SK Lusong Laku, Daerah Belaga, Bahagian Kapit boleh diperbaiki supaya setanding dengan pencapaian peringkat kebangsaan.

**Kata-kata Kunci:** Karies gigi, purata DMFT, Kapit, Sarawak

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## 55. STATUS KESIHATAN PERGIGIAN MURID-MURID 12 TAHUN SK NANGA ENKUAH, BAHAGIAN KAPIT, SARAWAK (PASUKAN PERGIGIAN BERGERAK) 2018 – 2023

*Senin B, Lee PS, Ngin WC, Wong ST*

**Pengenalan:** Karies gigi merupakan penyakit tidak berjangkit yang paling lazim walaupun penyakit tersebut boleh dicegah dan dirawat. Secara umumnya, tahap kesihatan pergigian murid sekolah di Bahagian Kapit, Sarawak adalah kurang memuaskan. Setakat ini, tiada kajian dijalankan untuk mengenalpasti status kesihatan pergigian murid-murid SK Nanga Engkuah, Daerah Song, Bahagian Kapit. **Objektif:** Objektif kajian ini adalah untuk mengukur prevalens karies, pengalaman karies dan keperluan rawatan karies bagi murid-murid 12 tahun di SK Nanga Engkuah, Kapit. **Kaedah Kajian:** Kajian keratan rentas ini melibatkan semua murid 12 tahun di bawah Program Pergigian Inkremental Kementerian Kesihatan Malaysia dari tahun 2018 sehingga 2023 kecuali 2020 dan 2021. Pemeriksa merupakan Juruterapi Pergigian yang telah dilatih dalam penggunaan indeks DMFT (decayed, missing and filled teeth), piawaian Pertubuhan Kesihatan Sedunia (WHO). **Keputusan Kajian:** Prevalens karies di kalangan empat kohort murid 12 tahun di SK Nanga Engkuah, Kapit menunjukkan julat 14.3% hingga 50.0% antara 2018 hingga 2023. Bagi pengalaman karies (purata DMFT) dan keperluan rawatan karies (purata D), keputusan kajian 2018-2023 masing-masing menunjukkan julat 0.43 hingga 2.00; dan peningkatan dari 0.00 (2018) ke 0.50 (2023). Untuk murid Tahun 1 (Kohort 2018), prevalens karies menunjukkan peningkatan daripada 12.5% (Tahun 1, 2018) ke 33.3% (Tahun 6, 2023). Pengalaman karies (purata DMFT) dan keperluan rawatan karies (purata D) pula masing-masing memaparkan julat 0.25 hingga 1.50 antara Tahun 1 (2018) hingga Tahun 6 (2023); dan kenaikan ketara daripada 0.13 (Tahun 1, 2018) ke 0.50 (Tahun 6, 2023). **Kesimpulan:** Secara keseluruhan, status kesihatan pergigian murid-murid 12 tahun di SK Nanga Engkuah, Daerah Song, Bahagian Kapit boleh diperbaiki supaya setanding dengan pencapaian peringkat kebangsaan.

**Kata-kata Kunci:** Karies gigi, purata DMFT, Kapit, Sarawak

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## 56. STATUS KESIHATAN PERGIGIAN MURID-MURID 12 TAHUN SK KAMPUNG BARU, BAHAGIAN KAPIT, SARAWAK (KLINIK PERGIGIAN SEKOLAH) 2018 – 2023

*Andrew Kana AS, Lee PS, Ngin WC, Wong ST*

**Pengenalan:** Karies gigi merupakan penyakit tidak berjangkit yang paling lazim walaupun penyakit tersebut boleh dicegah dan dirawat. Secara umumnya, tahap kesihatan pergigian murid sekolah di Bahagian Kapit, Sarawak adalah kurang memuaskan. Setakat ini, tiada kajian dijalankan untuk mengenalpasti status kesihatan pergigian murid-murid SK Kampung Baru, Daerah Kapit, Bahagian Kapit. **Objektif:** Objektif kajian ini adalah untuk mengukur prevalens karies, pengalaman karies dan keperluan rawatan karies bagi murid-murid 12 tahun di SK Kampung Baru, Kapit. **Kaedah Kajian:** Kajian keratan rentas ini melibatkan semua murid 12 tahun di bawah Program Pergigian Inkremental Kementerian Kesihatan Malaysia dari tahun 2018 sehingga 2023 kecuali 2020 dan 2021. Pemeriksa merupakan Juruterapi Pergigian yang telah dilatih dalam penggunaan indeks DMFT (decayed, missing and filled teeth), piawaian Pertubuhan Kesihatan Sedunia (WHO). **Keputusan Kajian:** Prevalens karies di kalangan empat kohort murid 12 tahun di SK Kampung Baru, Kapit menunjukkan julat 17.3% hingga 50.0% antara 2018 hingga 2023. Bagi pengalaman karies (purata DMFT) dan keperluan rawatan karies (purata D), keputusan kajian 2018-2023 masing-masing menunjukkan julat 0.94 hingga 1.48; dan 0.14 hingga 1.04. Untuk murid Tahun 1 (Kohort 2018), prevalens karies menunjukkan peningkatan daripada 8.9% (Tahun 1, 2018) ke 42.9% (Tahun 6, 2023). Pengalaman karies (purata DMFT) dan keperluan rawatan karies (purata D) pula masing-masing memaparkan peningkatan daripada 0.17 (Tahun 1, 2018) ke 1.18 (Tahun 6, 2023); dan julat 0.14 hingga 0.93 antara Tahun 1 (2018) hingga Tahun 6 (2023).

**Kesimpulan:** Secara keseluruhan, status kesihatan pergigian murid-murid 12 tahun di SK Kampung Baru, Daerah Kapit, Bahagian Kapit boleh diperbaiki supaya setanding dengan pencapaian peringkat kebangsaan.

**Kata-kata Kunci:** Karies gigi, purata DMFT, Kapit, Sarawak

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## 57. STATUS KESIHATAN PERGIGIAN MURID-MURID 12 TAHUN SK KAMPUNG PETANAK, BAHAGIAN MUKAH, SARAWAK (PASUKAN PERGIGIAN BERGERAK) 2018 - 2023

Iba G, Cheng WMH, Wong ST

**Pengenalan:** Karies gigi merupakan penyakit tidak berjangkit yang paling lazim walaupun penyakit tersebut boleh dicegah dan dirawat. Secara umumnya, tahap kesihatan pergigian murid sekolah di Bahagian Mukah, Sarawak adalah kurang memuaskan. Setakat ini, tiada kajian dijalankan untuk mengenalpasti status kesihatan pergigian murid-murid sekolah di SK Kampung Petanak, Mukah di bawah Pasukan Pergigian Bergerak. **Objektif:** Objektif kajian ini adalah untuk mengukur prevalens karies, pengalaman karies dan keperluan rawatan karies bagi murid-murid 12 tahun di SK Kampung Petanak, Mukah di bawah Pasukan Pergigian Bergerak. **Kaedah Kajian:** Kajian keratan rentas ini melibatkan semua murid 12 tahun di bawah Program Pergigian Inkremental Kementerian Kesihatan Malaysia dari tahun 2018 sehingga 2023 kecuali 2020 dan 2021. Pemeriksa merupakan Juruterapi Pergigian yang telah dilatih dalam penggunaan indeks DMFT (decayed, missing and filled teeth), piawaian Pertubuhan Kesihatan Sedunia (WHO). **Keputusan Kajian:** Prevalens karies di kalangan empat kohort murid 12 tahun di SK Kampung Petanak, Mukah menunjukkan penurunan daripada 58.7% (2018) ke 47.6% (2023). Bagi pengalaman karies (purata DMFT) dan keperluan rawatan karies (purata D), keputusan kajian masing-masing menggambarkan penurunan secara konsisten, iaitu daripada 1.74 (2018) ke 1.17 (2022); dan pola yang tidak stabil dengan julat 0.40 hingga 0.94. Untuk murid tahun 1 (Kohort 2018), prevalens karies menunjukkan peningkatan daripada 5.4% (Tahun 1, 2018) ke 47.6% (Tahun 6, 2023). Pengalaman karies (purata DMFT) dan keperluan rawatan karies (purata D) pula masing-masing memaparkan peningkatan daripada 0.14 (Tahun 1, 2018) ke 1.17 (Tahun 6, 2023), dan kenaikan daripada 0.00 (Tahun 1, 2018) kepada 0.70 (Tahun 5, 2022) dan penurunan ke 0.55 (Tahun 6, 2023). **Kesimpulan:** Secara keseluruhan, status kesihatan pergigian murid-murid 12 tahun di SK Kampung Petanak, Mukah boleh diperbaiki supaya setanding dengan pencapaian peringkat kebangsaan.

**Kata-kata Kunci:** Karies gigi, purata DMFT, Mukah, Sarawak

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## 58. STATUS KESIHATAN PERGIGIAN MURID-MURID 12 TAHUN SK MUKAH, BAHAGIAN MUKAH, SARAWAK (KLINIK PERGIGIAN SEKOLAH) 2018 - 2023

Mawi F, Winnie Cheng WMH, Wong ST

**Pengenalan:** Karies gigi merupakan penyakit tidak berjangkit yang paling lazim walaupun penyakit tersebut boleh dicegah dan dirawat. Secara umumnya, tahap kesihatan pergigian murid sekolah di Bahagian Mukah, Sarawak adalah kurang memuaskan. Setakat ini, tiada kajian dijalankan untuk mengenalpasti status kesihatan pergigian murid-murid SK Mukah. **Objektif:** Objektif kajian ini adalah untuk mengukur prevalens karies, pengalaman karies dan keperluan rawatan karies bagi murid-murid 12 tahun di SK Mukah, Mukah. **Kaedah Kajian:** Kajian keratan rentas ini melibatkan semua murid 12 tahun di bawah Program Pergigian Inkremental Kementerian Kesihatan Malaysiadari tahun 2018 sehingga 2023 kecuali 2020 dan 2021. Pemeriksa merupakan Juruterapi Pergigian yang telah dilatih dalam penggunaan indeks DMFT (decayed, missing and filled teeth), piawaian Pertubuhan Kesihatan Sedunia (WHO). **Keputusan Kajian:** Prevalens karies di kalangan empat kohot murid 12 tahun di SK Mukah, Mukah menunjukkan penurunan daripada 50.9% (2018) ke 46.0% (2023). Bagi pengalaman karies (purata DMFT) dan keperluan rawatan karies (purata D), keputusan kajian masing-masing menggambarkan penurunan yang perlahan, iaitu daripada 1.25 (2018) ke 1.22 (2023); dan tren peningkatan daripada 0.26 (2018) ke 0.60 (2022) dan seterusnya penurunan hampir 50% ke 0.26 (2023). Untuk murid Tahun 1 (Kohot 2018), prevalens karies menunjukkan peningkatan daripada 2.3% (Tahun 1, 2018) ke 46.0% (Tahun 6, 2023). Pengalaman karies (purata DMFT) dan keperluan rawatan karies (purata D) pula masing-masing memaparkan peningkatan daripada 0.02 (Tahun 1, 2018) ke 1.22 (Tahun 6, 2023); dan kenaikan daripada 0.22 (Tahun 1, 2018) ke 0.77 (Tahun 5, 2022) dan seterusnya penurunan ke 0.26 (Tahun 6, 2023). **Kesimpulan:** Secara keseluruhan, status kesihatan pergigian murid-murid 12 tahun di SK Mukah, Mukah boleh diperbaiki supaya setanding dengan pencapaian peringkat kebangsaan.

**Kata-kata Kunci:** Karies gigi, purata DMFT, Mukah, Sarawak

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## 59. STATUS KESIHATAN PERGIGIAN MURID-MURID 12 TAHUN SK ST ANNE BARU, BAHAGIAN SARIKEI, SARAWAK (KLINIK PERGIGIAN SEKOLAH) 2018 – 2023

*Enggek M, Mohd Zailani N, Hwang YL, Wong ST*

**Pengenalan:** Karies gigi merupakan penyakit tidak berjangkit yang paling lazim walaupun penyakit tersebut boleh dicegah dan dirawat. Secara umumnya, tahap kesihatan pergigian murid sekolah di Bahagian Sarikei, Sarawak adalah kurang memuaskan. Setakat ini, tiada kajian dijalankan untuk mengenalpasti status kesihatan pergigian murid-murid SK St Anne, Sarikei. **Objektif:** Objektif kajian ini adalah untuk mengukur prevalens karies, pengalaman karies dan keperluan rawatan karies bagi murid-murid 12 tahun di SK St Anne, Sarikei. **Kaedah Kajian:** Kajian keratan rentas ini melibatkan semua murid 12 tahun di bawah Program Pergigian Inkremental Kementerian Kesihatan Malaysia dari tahun 2018 sehingga 2023 kecuali 2020 dan 2021. Pemeriksa merupakan Juruterapi Pergigian yang telah dilatih dalam penggunaan indeks DMFT (decayed, missing and filled teeth), piawaian Pertubuhan Kesihatan Sedunia (WHO). **Keputusan Kajian:** Prevalens karies di kalangan empat kohort murid 12 tahun di SK St Anne, Sarikei menunjukkan peningkatan secara perlahan daripada 24.5% (2018) ke 29.0% (2023). Bagi pengalaman karies (purata DMFT) dan keperluan rawatan karies (purata D), keputusan kajian antara 2018 hingga 2023 masing-masing menunjukkan julat 0.47 hingga 0.60; dan 0.05 hingga 0.28. Untuk murid Tahun 1 (Kohot 2018), prevalens karies menunjukkan peningkatan daripada 9.0% (Tahun 1, 2018) ke 29.0% (Tahun 6, 2023). Pengalaman karies (purata DMFT) dan keperluan rawatan karies (purata D) pula masing-masing memaparkan peningkatan daripada 0.13 (Tahun 1, 2018) ke 0.57 (Tahun 6, 2023); dan dalam julat 0.04 dan 0.36. **Kesimpulan:** Secara keseluruhan, status kesihatan pergigian murid-murid 12 tahun di SK St Anne, Sarikei boleh diperbaiki supaya setanding dengan pencapaian peringkat kebangsaan.

**Kata-kata Kunci:** Karies gigi, purata DMFT, Sarikei, Sarawak

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## 60. STATUS KESIHATAN PERGIGIAN MURID-MURID 12 TAHUN SK NG STRAS, BAHAGIAN SARIKEI, SARAWAK (PASUKAN PERGIGIAN BERGERAK) 2018 – 2023

*Suhaili F, Morsili H, Hwang YL, Wong ST*

**Pengenalan:** Karies gigi merupakan penyakit tidak berjangkit yang paling lazim walaupun penyakit tersebut boleh dicegah dan dirawat. Secara umumnya, tahap kesihatan pergigian murid sekolah di Bahagian Sarikei, Sarawak adalah kurang memuaskan. Setakat ini, tiada kajian dijalankan untuk mengenalpasti status kesihatan pergigian murid-murid SK Ng Stras, Daerah Maradong, Sarikei. **Objektif:** Objektif kajian ini adalah untuk mengukur prevalens karies, pengalaman karies dan keperluan rawatan karies bagi murid-murid 12 tahun di SK Ng Stras, Sarikei. **Kaedah Kajian:** Kajian keratan rentas ini melibatkan semua murid 12 tahun di bawah Program Pergigian Inkremental Kementerian Kesihatan Malaysia dari tahun 2018 sehingga 2023 kecuali 2020 dan 2021. Pemeriksa merupakan Juruterapi Pergigian yang telah dilatih dalam penggunaan indeks DMFT (decayed, missing and filled teeth), piawaian Pertubuhan Kesihatan Sedunia (WHO). **Keputusan Kajian:** Prevalens karies di kalangan empat kohort murid 12 tahun di SK Ng Stras, Sarikei adalah dalam julat 29.0% hingga 37.0% antara 2018 hingga 2023. Bagi pengalaman karies (purata DMFT) dan keperluan rawatan karies (purata D), keputusan kajian antara 2018 hingga 2023 masing-masing menunjukkan julat 0.42 hingga 0.88; dan 0.11 hingga 0.60. Untuk murid Tahun 1 (Kohot 2018), prevalens karies menunjukkan peningkatan daripada 3.2% (Tahun 1, 2018) ke 29.0% (Tahun 6, 2023). Pengalaman karies (purata DMFT) dan keperluan rawatan karies (purata D) pula masing-masing memaparkan peningkatan daripada 0.07 Tahun 1, 2018) ke 0.42 (Tahun 6, 2023); dan dalam julat 0.03 dan 0.58. **Kesimpulan:** Secara keseluruhan, status kesihatan pergigian murid-murid 12 tahun di SK Ng Stras, Sarikei boleh diperbaiki supaya setanding dengan pencapaian peringkat kebangsaan.

**Kata-kata Kunci:** Karies gigi, purata DMFT, Sarikei, Sarawak

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## 61. STATUS KESIHATAN PERGIGIAN MURID-MURID 12 TAHUN SJK(C) TAMAN RAJANG, BAHAGIAN SIBU, SARAWAK (KLINIK PERGIGIAN SEKOLAH) 2018 – 2023

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**Pengenalan:** Karies gigi merupakan penyakit tidak berjangkit yang paling lazim walaupun penyakit tersebut boleh dicegah dan dirawat. Secara umumnya, tahap kesihatan pergigian murid sekolah di Bahagian Sibu, Sarawak adalah kurang memuaskan. Setakat ini, tiada kajian dijalankan untuk mengenalpasti status kesihatan pergigian murid-murid SJK(C) Taman Rajang, Sibu. **Objektif:** Objektif kajian ini adalah untuk mengukur prevalens karies, pengalaman karies dan keperluan rawatan karies bagi murid-murid 12 tahun di SJK(C) Taman Rajang, Sibu. **Kaedah Kajian:** Kajian keratan rentas ini melibatkan semua murid 12 tahun di bawah Program Pergigian Inkremental Kementerian Kesihatan Malaysia dari tahun 2018 sehingga 2023 kecuali 2020 dan 2021. Pemeriksa merupakan Juruterapi Pergigian yang telah dilatih dalam penggunaan indeks DMFT (decayed, missing and filled teeth), piawaian Pertubuhan Kesihatan Sedunia (WHO). **Keputusan Kajian:** Prevalens karies di kalangan empat kohort murid 12 tahun di SJK(C) Taman Rajang, Sibu adalah dalam julat 11.9% hingga 33.6% antara 2018 hingga 2023. Bagi pengalaman karies (purata DMFT) dan keperluan rawatan karies (purata D), keputusan kajian antara 2018 hingga 2023 masing-masing menunjukkan julat 0.13 hingga 0.44; dan 0.04 hingga 0.16. Untuk murid Tahun 1 (Kohot 2018), prevalens karies menunjukkan peningkatan daripada 3.2% (Tahun 1, 2018) ke 17.6% (Tahun 6, 2023). Pengalaman karies (purata DMFT) dan keperluan rawatan karies (purata D) pula masing-masing memaparkan peningkatan daripada 0.04 (Tahun 1, 2018) ke 0.27 (Tahun 6, 2023); dan kenaikan daripada 0.02 (Tahun 1, 2018) ke 0.11 (Tahun 5, 2022), dan seterusnya penurunan ke 0.10 (Tahun 6, 2023). **Kesimpulan:** Secara keseluruhan, status kesihatan pergigian murid-murid 12 tahun di SJK(C) Taman Rajang, Sibu boleh diperbaiki supaya setanding dengan pencapaian peringkat kebangsaan.

**Kata-kata Kunci:** Karies gigi, purata DMFT, Sibu, Sarawak

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## 62. STATUS KESIHATAN PERGIGIAN MURID-MURID 12 TAHUN SJK(C) TIONG HIN, BAHAGIAN SIBU, SARAWAK (KLINIK PERGIGIAN SEKOLAH) 2018 – 2023

Sait S, Su ISH, Mowe S, Wong ST

**Pengenalan:** Karies gigi merupakan penyakit tidak berjangkit yang paling lazim walaupun penyakit tersebut boleh dicegah dan dirawat. Secara umumnya, tahap kesihatan pergigian murid sekolah di Bahagian Sibu, Sarawak adalah kurang memuaskan. Setakat ini, tiada kajian dijalankan untuk mengenalpasti status kesihatan pergigian murid-murid SJK(C) Tiong Hin, Sibu. **Objektif:** Objektif kajian ini adalah untuk mengukur prevalens karies, pengalaman karies dan keperluan rawatan karies bagi murid-murid 12 tahun di SJK(C) Tiong Hin, Sibu. **Kaedah Kajian:** Kajian keratan rentas ini melibatkan semua murid 12 tahun di bawah Program Pergigian Inkremental Kementerian Kesihatan Malaysia dari tahun 2018 sehingga 2023 kecuali 2020 dan 2021. Pemeriksa merupakan Juruterapi Pergigian yang telah dilatih dalam penggunaan indeks DMFT (decayed, missing and filled teeth), piawaian Pertubuhan Kesihatan Sedunia (WHO). **Keputusan Kajian:** Prevalens karies di kalangan empat kohort murid 12 tahun di SJK(C) Tiong Hin, Sibu adalah dalam julat 10.4% hingga 15.1% antara 2018 hingga 2023. Bagi pengalaman karies (purata DMFT) dan keperluan rawatan karies (purata D), keputusan kajian antara 2018 hingga 2023 masing-masing menunjukkan julat 0.14 hingga 0.31; dan 0.00 hingga 0.06. Untuk murid Tahun 1 (Kohort 2018), prevalens karies menunjukkan peningkatan daripada 0.0% (Tahun 1, 2018) ke 14.8% (Tahun 6, 2023). Pengalaman karies (purata DMFT) dan keperluan rawatan karies (purata D) pula masing-masing menunjukkan peningkatan daripada 0.00 (Tahun 1, 2018) ke 0.31 (Tahun 6, 2023); dan kenaikan daripada 0.00 (Tahun 1, 2018) ke 0.06 (Tahun 5, 2022), dan seterusnya penurunan ke 0.03 (Tahun 6, 2023). **Kesimpulan:** Secara keseluruhan, status kesihatan pergigian murid-murid 12 tahun di SJK(C) Tiong Hin, Sibu boleh diperbaiki supaya setanding dengan pencapaian peringkat kebangsaan.

**Kata-kata Kunci:** Karies gigi, purata DMFT, Sibu, Sarawak

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### 63. STATUS KESIHATAN PERGIGIAN MURID-MURID 12 TAHUN SK SIBU JAYA, BAHAGIAN SIBU, SARAWAK (KLINIK PERGIGIAN SEKOLAH) 2018 – 2023

*Ehie NI, Nanyie L, Mowe S, Wong ST*

**Pengenalan:** Karies gigi merupakan penyakit tidak berjangkit yang paling lazim walaupun penyakit tersebut boleh dicegah dan dirawat. Secara umumnya, tahap kesihatan pergigian murid sekolah di Bahagian Sibu, Sarawak adalah kurang memuaskan. Setakat ini, tiada kajian dijalankan untuk mengenalpasti status kesihatan pergigian murid-murid SK Sibu Jaya, Sibu. **Objektif:** Objektif kajian ini adalah untuk mengukur prevalens karies, pengalaman karies dan keperluan rawatan karies bagi murid-murid 12 tahun di SK Sibu Jaya, Sibu. **Kaedah Kajian:** Kajian keratan rentas ini melibatkan semua murid 12 tahun di bawah Program Pergigian Inkremental Kementerian Kesihatan Malaysia dari tahun 2018 sehingga 2023 kecuali 2020 dan 2021. Pemeriksa merupakan Juruterapi Pergigian yang telah dilatih dalam penggunaan indeks DMFT (decayed, missing and filled teeth), piawaian Pertubuhan Kesihatan Sedunia (WHO). **Keputusan Kajian:** Prevalens karies di kalangan empat kohort murid 12 tahun di SK Sibu Jaya, Sibu adalah dalam julat 17.1% hingga 31.4% antara 2018 hingga 2023. Bagi pengalaman karies (purata DMFT) dan keperluan rawatan karies (purata D), keputusan kajian antara 2018 hingga 2023 masing-masing menunjukkan julat 0.29 hingga 0.65; dan 0.15 hingga 0.25. Untuk murid Tahun 1 (Kohot 2018), prevalens karies menunjukkan peningkatan daripada 7.6% (Tahun 1, 2018) ke 22.8% (Tahun 6, 2023). Pengalaman karies (purata DMFT) dan keperluan rawatan karies (purata D) pula masing-masing memaparkan peningkatan daripada 0.13 (Tahun 1, 2018) ke 0.49 (Tahun 6, 2023); dan dalam julat 0.05 hingga 0.24 antara Tahun 1 (2018) hingga Tahun 6 (2023). **Kesimpulan:** Secara keseluruhan, status kesihatan pergigian murid-murid 12 tahun di SK Sibu Jaya, Sibu boleh diperbaiki supaya setanding dengan pencapaian peringkat kebangsaan.

**Kata-kata Kunci:** Karies gigi, purata DMFT, Sibu, Sarawak

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#### 64. STATUS KESIHATAN PERGIGIAN MURID-MURID 12 TAHUN SK KAMPUNG BAHAGIAN JAYA, BAHAGIAN SIBU, SARAWAK (PASUKAN PERGIGIAN BERGERAK) 2018 – 2023

Ahmid MF, Nanyie L, Mowe S, Wong ST

**Pengenalan:** Karies gigi merupakan penyakit tidak berjangkit yang paling lazim walaupun penyakit tersebut boleh dicegah dan dirawat. Secara umumnya, tahap kesihatan pergigian murid sekolah di Bahagian Sibu, Sarawak adalah kurang memuaskan. Setakat ini, tiada kajian dijalankan untuk mengenalpasti status kesihatan pergigian murid-murid SK Kampung Bahagian Jaya, Sibu. **Objektif:** Objektif kajian ini adalah untuk mengukur prevalens karies, pengalaman karies dan keperluan rawatan karies bagi murid-murid 12 tahun di SK Kampung Bahagian Jaya, Sibu. **Kaedah Kajian:** Kajian keratan rentas ini melibatkan semua murid 12 tahun di bawah Program Pergigian Inkremental Kementerian Kesihatan Malaysia dari tahun 2018 sehingga 2023 kecuali 2020 dan 2021. Pemeriksa merupakan Juruterapi Pergigian yang telah dilatih dalam penggunaan indeks DMFT (decayed, missing and filled teeth), piawaian Pertubuhan Kesihatan Sedunia (WHO). **Keputusan Kajian:** Prevalens karies di kalangan empat kohort murid 12 tahun di SK Kampung Bahagian Jaya, Sibu menunjukkan penurunan daripada 28.9% (2018) ke 12.5% (2023). Bagi pengalaman karies (purata DMFT) dan keperluan rawatan karies (purata D), keputusan kajian antara 2018 hingga 2023 masing-masing menunjukkan julat 0.21 hingga 0.67; dan 0.09 hingga 0.22. Untuk murid Tahun 1 (Kohort 2018), prevalens karies menunjukkan peningkatan daripada 1.0% (Tahun 1, 2018) ke 12.5% (Tahun 6, 2023). Pengalaman karies (purata DMFT) dan keperluan rawatan karies (purata D) pula masing-masing memaparkan peningkatan daripada 0.03 (Tahun 1, 2018) ke 0.21 (Tahun 6, 2023); dan dalam julat 0.03 hingga 0.14 antara Tahun 1 (2018) hingga Tahun 6 (2023). **Kesimpulan:** Secara keseluruhan, status kesihatan pergigian murid-murid 12 tahun di SK Kampung Bahagian Jaya, Sibu boleh diperbaiki supaya setanding dengan pencapaian peringkat kebangsaan.

**Kata-kata Kunci:** Karies gigi, purata DMFT, Sibu, Sarawak

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## 65. STATUS KESIHATAN PERGIGIAN MURID-MURID 12 TAHUN SK NANGA MACHAN, BAHAGIAN SIBU, SARAWAK (PASUKAN PERGIGIAN BERGERAK) 2018 – 2023

*Kong LY, Su ISH, Mowe S, Wong ST*

**Pengenalan:** Karies gigi merupakan penyakit tidak berjangkit yang paling lazim walaupun penyakit tersebut boleh dicegah dan dirawat. Secara umumnya, tahap kesihatan pergigian murid sekolah di Bahagian Sibu, Sarawak adalah kurang memuaskan. Setakat ini, tiada kajian dijalankan untuk mengenalpasti status kesihatan pergigian murid-murid SK Nanga Machan, Sibu. **Objektif:** Objektif kajian ini adalah untuk mengukur prevalens karies, pengalaman karies dan keperluan rawatan karies bagi murid-murid 12 tahun di SK Nanga Machan, Sibu. **Kaedah Kajian:** Kajian keratan rentas ini melibatkan semua murid 12 tahun di bawah Program Pergigian Inkremental Kementerian Kesihatan Malaysia dari tahun 2018 sehingga 2023 kecuali 2020 dan 2021. Pemeriksa merupakan Juruterapi Pergigian yang telah dilatih dalam penggunaan indeks DMFT (decayed, missing and filled teeth), piawaian Pertubuhan Kesihatan Sedunia (WHO). **Keputusan Kajian:** Prevalens karies di kalangan empat kohort murid 12 tahun di SK Nanga Machan, Sibu menunjukkan penurunan daripada 57.1% (2018) ke 33.3% (2023). Bagi pengalaman karies (purata DMFT) dan keperluan rawatan karies (purata D), keputusan kajian antara 2018 hingga 2023 masing-masing menunjukkan julat 0.69 hingga 1.79; dan 0.17 hingga 0.62. Untuk murid Tahun 1 (Kohort 2018), prevalens karies memaparkan peningkatan daripada 12.5% (Tahun 1, 2018) ke 33.3% (Tahun 6, 2023). Pengalaman karies (purata DMFT) dan keperluan rawatan karies (purata D) pula masing-masing memaparkan peningkatan daripada 0.25 (Tahun 1, 2018) ke 0.93 (Tahun 6, 2023); dan dalam julat 0.07 hingga 0.38 antara Tahun 1 (2018) hingga Tahun 6 (2023). **Kesimpulan:** Secara keseluruhan, status kesihatan pergigian murid-murid 12 tahun di SK Nanga Machan, Sibu boleh diperbaiki supaya setanding dengan pencapaian peringkat kebangsaan.

**Kata-kata Kunci:** Karies gigi, purata DMFT, Sibu, Sarawak

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## 66. DEVELOPMENT AND VALIDATION OF A QUESTIONNAIRE ON PERCEIVED PROSTHODONTIC TREATMENT NEEDS IN MALAYSIAN ADULTS

*Soo SY, Lee SM, Tew IM, Dom TN, Yahya NA*

**Statement of problem:** A discrepancy between dentists' assessments and patients' expectations during prosthodontic treatment is inevitable. Incorporating dental patients' concerns about their prosthodontic treatment needs is essential during treatment planning, yet studies assessing these needs in adult dental patients are lacking. **Purpose:** The purpose of this study was to develop and validate a novel instrument, termed the questionnaire on perceived prosthodontic treatment needs (PPTN), that assesses perceived prosthodontic treatment needs in adults. **Material and methods:** The PPTN was developed following a literature review, consultation with healthcare workers, and patient interviews. It included 15 questions and a self-rated need for prosthodontic treatment, categorized on a Likert scale. A cross-sectional descriptive study was completed on 193 dental patients seeking or receiving prosthodontic treatment. **Results:** Three perceived prosthodontic treatment need factors were identified (psychosocial impact, esthetic concern, and function) by using exploratory factor analysis. A higher PPTN score indicated greater perceived prosthodontic treatment needs. The identified factors represent 67.8% of the variance with eigenvalues of >1. The PPTN had a high degree of internal consistency and reliability, as the final questionnaire received a Cronbach alpha of 0.75 and an intraclass coefficient of 0.75 with a 95% confidence interval of 0.68 to 0.80 ( $F(192, 576)=3.94, P<.001$ ). **Conclusions:** The newly developed questionnaire was valid and will help understand patients' perceived treatment needs and benefit further prosthodontic research and clinical application.

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## 67. PERCEIVED STRESS, SEVERITY OF XEROSTOMIA, AND PERIODONTAL STATUS IN UNDERGRADUATE DENTAL STUDENTS

Muzhaffar EA, Berahim Z, Wahab NA, Saddki N

**Introduction:** Dentistry is a highly stressful program; stress is associated with xerostomia and periodontal disease. **Objective:** This study aims to investigate the association of perceived stress, severity of xerostomia, and periodontal status in dental students. **Methods:** This was a two-phase cross-sectional study of 245 Universiti Sains Malaysia (USM) undergraduate dental students. Phase 1 involved administration of the Perceived Stress Scale (PSS-10) and Summated Xerostomia Inventory (SXI). In phase 2, the Community Periodontal Index (CPI) was performed on 150 students to determine their periodontal status. **Results:** Mean PSS-10 and SXI scores were 19.6 (SD 5.47) and 7.9 (SD 2.04), respectively. Only 7.3% students had healthy periodontium while 17.3% had gingival bleeding, 65.3% had calculus, 6.7% had shallow pockets, and 3.3% had deep pockets. The association of perceived stress, severity of xerostomia, and periodontal status was not significant. Nevertheless, a significant positive correlation was found between PSS-10 and SXI scores ( $r = 0.318$ ,  $p < 0.01$ ). **Conclusion:** Most USM dental students were affected by some degree of periodontal disease, but it was not associated with perceived stress or severity of xerostomia. Students with higher perceived stress had more severe xerostomia. Information from this study could be utilised by the dental school in planning towards providing a stress-free training environment.

**Keywords:** Dental students, periodontal disease, psychological stress, xerostomia

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## 68. IS THE BURDEN OF DENTAL CARIES HIGHER IN A PRIVATE KINDERGARTEN COMPARED TO THE NATIONAL PREVALENCE?

Quan LK, Goh WS, Irwandee EE, Esa R

**Background and aim:** Currently, the caries prevalence and experience among Malaysian preschoolers remains high. This study aimed to investigate the caries prevalence, experience and oral hygiene status among children attending a private kindergarten and to compare the findings with the general population. Additionally, the oral health knowledge, attitude and behaviour were assessed. **Methods:** This pilot study was conducted involving 100 preschool children aged 4-6 years in a private kindergarten. Caries parameters and plaque scores were assessed through oral examinations, while a questionnaire evaluated oral health knowledge, attitude and behaviour. **Results:** Overall, 87% children participated and the prevalence of dental caries was 56.3%. The mean of decayed, missing, filled teeth and dmft were 2.14, 0.22, 0.07 and 2.43. The mean plaque score was 20.5% (overall) and 16.5% (anterior). The overall oral hygiene status was: 50.6% (excellent), 21.8% (good), 3.4% (fair) and 24.1% (poor). Majority had knowledge regarding dental caries (77.5%). However, less than 37.5% knew the adverse effects of dental plaque and fizzy drinks on the teeth. More than half (52.5%) had regular dental visits, 82.5% brushed their teeth frequently and had good diet behavior. **Conclusion:** This study highlighted a positive trend in oral health among children in a private preschool, despite the lack of attention from government-funded oral health programmes. While the overall caries prevalence is lower than national average, it is important to note instances of elevated caries levels among some individuals. Nevertheless, further oral health programmes are essential, with particular emphasis on private kindergarten settings.

**Keywords:** Dental caries, plaque score, preschool children, private kindergarten

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## **DOMAIN 2**

# **Oral Health Intervention and Empowerment**



## 69. EDUCATIONAL VIDEOS AS AN ORAL HEALTH EDUCATION INTERVENTION ON PRESCHOOL CHILDREN WITH CARIES AND WITHOUT CARIES

Ramli MZ, Ismail AF, Azmi NS

**Introduction:** Oral health education is crucial for preschool children as it lays the foundation for lifelong dental hygiene practices. Educational videos serve as an engaging intervention tool for promoting oral health among preschool children. This study was a part of a research on salivary microbiome. **Objective:** This study aimed to identify the effectiveness of educational videos as an intervention to increase the knowledge of preschool children with and without caries on oral hygiene and diseases. **Methods:** Ten preschool children aged 4-6 years old, consisting of five with caries and another five without caries, were asked to watch twelve educational videos on YouTube prepared by the Ministry of Health Malaysia from February until May 2022. The videos showed cartoons, animations, and storytelling on oral health and diseases. Their parents were then asked to rate Yes or No on whether their kids' knowledge had increased on the topics presented in the videos. Paired samples t-test and Mann-Whitney U test were used to compare the means between before and after watching the videos by means of the IBM SPSS Statistics 25. **Results:** The preschool children had little knowledge on oral health and diseases before watching the videos. Regardless of caries status, both groups of preschool children had significantly increased their knowledge on the topics after watching the educational videos ( $p < .001$ ). **Conclusion:** The educational videos were effective to increase the preschool children's knowledge on oral health and disease whether or not they had caries.

**Keywords:** Oral health education, caries, preschool children, educational videos

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## 70. THE EFFECTIVENESS OF ORAL HEALTH EDUCATION WITH OR WITHOUT ADDITIONAL ACTIVITY FOR IMPROVING ORAL HEALTH STATUS IN CHILDREN AT VARYING AGE GROUPS: A SYSTEMATIC REVIEW AND META-ANALYSIS

*Ayub SS, Sinor MZ, Ahmad B, Sanusi SY*

**Introduction:** It is unclear whether oral health education (OHE) interventions with additional activities such as topical fluoride application, compared to those without, are effective for improving oral health status in children. The reception of OHE by children is influenced by cognitive development and function that vary by age. **Objectives:** This systematic review aimed to examine whether OHE interventions with additional activities, compared to those without, are more effective in improving the oral health status of pre-, primary, and secondary school children. **Methodology:** Articles published between 2015 and 2021 were searched in CENTRAL, PubMed, and Scopus databases following the outlined protocol and using keywords constructed from research questions. Of 784 records found, 17 met the eligibility criteria and six were eligible for review and meta-analysis by age groups. The meta-analysis used the random and fixed effects model at a 5% significant level. **Results:** In preschool children, the combination of OHE and fluoride application was not effective in reducing caries experience (WMD -0.56, 95% CI: -1.60 to 0.48) and surface caries (WMD -1.20, 95% CI: -3.38 to 0.99). In primary school children, OHE was effective in reducing plaque accumulation and gingivitis but was inconclusive for dental caries in individual studies; meta-analysis was not performed due to lacking eligible studies. In secondary school children, OHE was effective in reducing gingivitis (WMD -0.66, 95% CI: -0.83 to -0.50) but not in reducing dental caries (WMD -0.28, 95% CI: -1.14 to 0.58) and plaque accumulation (WMD -0.10, 95% CI: -0.25 to 0.06). **Conclusion:** The evidence supporting the combination of OHE and other activities in an intervention on pre-, primary, and secondary school children is still inconclusive. More research is needed to determine the optimum strategies and designs of intervention programs for specific age groups.

**Keywords:** effectiveness, children, clinical outcomes, oral health education, systematic reviews

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## 71. EFFECTIVENESS OF ORAL HEALTH INTERVENTIONS FOR SCHOOLCHILDREN FROM DISADVANTAGED BACKGROUNDS: A SYSTEMATIC REVIEW PROTOCOL

*Tajudin AN, Anuwar AH, Marhazlinda J, Yusof ZY*

Disadvantaged schoolchildren from rural and low socioeconomic backgrounds face persistent oral health inequalities, specifically dental caries, and periodontal diseases. This protocol aims to review the effectiveness of promotive and preventive oral health interventions for improving the oral health of primary schoolchildren in these areas. We will search the PubMed, MEDLINE, and Cumulative Index to Nursing and Allied Health Literature (CINAHL) via EBSCOhost, Cochrane Library, Web of Science, Dentistry and Oral Sciences databases for studies published from 2000–2023. The review includes randomised/nonrandomised controlled trials and community trials evaluating the effectiveness of promotive and preventive oral health interventions on at least one of these outcomes: changes in dental caries status, periodontal disease status, oral hygiene status/practices, sugar consumption, or smoking behaviours. Two reviewers will independently assess the searched articles, extract the data, and assess the risk of bias in the studies using the Cochrane Risk of Bias 2 (ROB 2) for randomised controlled trials and Risk of Bias in Non-randomized Studies of Interventions (ROBINSI) for non-randomised controlled trials. Both narrative and quantitative analyses will be conducted. However, only narrative synthesis will be performed if the data are substantially heterogeneous. The synthesised evidence from this review can inform policymakers on evidence-based interventions to improve the oral health outcomes of schoolchildren from rural and low socioeconomic backgrounds. Systematic Review Registration PROSPERO (Registration number: CRD42022344898).

**Keywords:** Child, dental health education, low socioeconomic status, rural population, school dentistry

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## 72. EFFECTIVE ORAL HEALTH INTERVENTIONS FOR DISADVANTAGED SCHOOLCHILDREN: A SYSTEMATIC REVIEW

*Tajudin AN, Anuwar AH, Jamaludin M, Yusof ZY*

**Introduction:** Children from rural and low socioeconomic backgrounds face persistent inequalities in oral health, specifically dental caries, and periodontal diseases. **Objectives:** This review aimed to identify effective interventions for promoting oral health and preventing oral diseases among primary schoolchildren from rural and low socioeconomic backgrounds. **Methods:** We conducted a comprehensive search using PubMed, MEDLINE and CINAHL via EBSCOhost, Cochrane Library, Web of Science, and Dentistry and Oral Sciences databases for English publications from 2000 to 2022. We included both randomised and non-randomised controlled trials that evaluated promotive and preventive oral health interventions targeting primary schoolchildren from rural and low socioeconomic backgrounds. Measured outcomes encompassed changes in dental caries status, periodontal disease status, oral hygiene status or practices, sugar consumption, or smoking behaviours. Two reviewers independently screened the articles, performed data extraction using a standardised form, and assessed the risk of bias using the Cochrane Risk of Bias 2 (RoB 2) and Risk of Bias in Non-randomized Studies - of Interventions (ROBINS-I) tools. Given the substantial heterogeneity, a narrative analysis was undertaken. **Methods:** Of the 35 included studies, the interventions identified as effective were health and oral health education (n=20), establishment of school or community health policies (n=5), fissure sealants (n=4), professionally applied topical fluoride (n=10), supervised toothbrushing (n=7), provision of free toothbrush and toothpaste (n=1), and fluoride mouth rinse (n=2). These interventions were found to be effective in addressing caries (n=15), periodontal disease (n=2), oral hygiene (n=2), sugar consumption (n=6) and tobacco use (n=2). However, many of the included studies have a high risk of bias. **Conclusion:** Despite the risk, these findings represent the best available evidence and serve as insights into effective interventions for disadvantaged schoolchildren. Future well-designed studies are required to provide high-quality evidence. The findings indicate that a comprehensive intervention involving both clinical prevention and oral health promotion can significantly improve the oral health of disadvantaged primary schoolchildren.

**Keywords:** Children, intervention, low socioeconomic, oral health promotion, prevention, rural

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### 73. FACILITATORS TO THE IMPLEMENTATION OF THE SPARKLE PACKAGE: A QUALITATIVE STUDY OF TEACHERS' PERSPECTIVES

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**Introduction:** Teachers are key implementers of the SPARKLE (School Programme for Achieving Radiant Smiles in Kids from Rural and Low Socioeconomic Backgrounds), designed to address oral health disparities among primary schoolchildren from rural and low-income communities. Their participation is essential for the programme's success, but various factors influence their engagement. **Aim:** This study aimed to explore potential facilitators that could encourage teachers' participation in the SPARKLE programme, recognising their pivotal role in its successful implementation. **Methods:** An exploratory qualitative approach was employed, with primary schools in three districts in Negeri Sembilan selected as study areas due to their high incidences of absolute poverty. In-depth interviews were conducted with purposively sampled teachers, who are potential programme implementers. The interview questions were developed from a comprehensive literature review, and data were analysed using the Framework Method with Atlas.ti software. **Results:** Several facilitators were identified across different levels. At the school level, adequate facilities, such as sinks and toothbrush storage, along with strong administrative support and funding, were crucial. Teachers' willingness to participate was influenced by their positive attitudes towards oral health promotion and prior experience in similar initiatives. Parental involvement also played a role, as teachers believed strong parental support could reinforce oral health habits at home. Also, students' enthusiasm for hands-on learning and peer-led activities were seen as motivating factors. Beyond the school environment, community leaders were recognised as influential in encouraging parental engagement and fostering a supportive culture for the programme. **Conclusion:** This study highlights multiple factors that can enhance teacher participation in the SPARKLE programme, ensuring its effective implementation. These insights will guide improvements to the intervention and its integration into schools to support better oral health outcomes for children from disadvantaged backgrounds.

**Keyword:** Oral health, health education, schools, teachers, program development

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## 74. OPINIONS OF SCHOOLCHILDREN AND TEACHERS ON DENTAL SCIENCE KIT (DES-KIT) MODULE AS A SUPPLEMENTARY TEACHING TOOL IN ORAL HEALTH EDUCATION

Wong FJ, Mohd Nor NA, Tengku Hamzah TNN

**Aim:** To explore the opinions of schoolchildren and teachers on the newly developed Dental Science Kit (DES-Kit) module as a supplementary oral health education tool. **Method:** The DES-Kit manual consisted of an illustrated guidebook in the Malay language and ten activity kits designed for schoolchildren aged 10-12 to engage in dental science-related activities. The DES-Kit manual was developed based on literature and expert group discussion for content creation, followed by validation and refinement. A qualitative study was conducted using Focus Group Discussions (FGDs) to gather opinions on the content appropriateness and learning experiences following the implementation of the DES-Kit activities at two schools in Kuala Lumpur, involving schoolchildren and teachers. Audio recordings of the FGDs were transcribed verbatim, coded using Qual-coder software, and analysed thematically. **Results:** Six FGDs were conducted involving 24 participants, achieving data saturation. Feedback indicated that the DES-Kit was appropriate for the target age group, with activities that were practical, relatable and suitable for group activities in multiple settings. The use of colourful and well-organised graphics captured and maintained schoolchildren's interest. Most participants expressed enjoyment and excitement about the hands-on activity, teamwork and the opportunity to discover new knowledge. However, some activities were noted to require safety consideration and adult supervision. **Conclusion:** Overall, the DES-Kit module received positive feedback from both schoolchildren and teachers, highlighting its appropriateness and potential to enhance the learning experience in oral health education. Future research could explore the long-term effectiveness of the DES-Kit.

**Keywords:** Oral health education, oral health promotion, schoolchildren

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## 75. PRIORITIZING ORAL HEALTH IN MALAYSIAN TRANSGENDER WOMEN: MHEALTH EDUCATIONAL INTERVENTION

*Telang LA, Cotter G, Rashid A*

**Background:** Transgender women in Malaysia are vulnerable and marginalized. They experience unique social and interpersonal challenges that contribute to relatively unmet health care needs thereby increasing their risk of acquiring HIV and sexually transmitted infections (STIs). A qualitative study using in-depth interviews (n=20) and focus group discussion was undertaken to explore the barriers and enablers of oral health care utilization as well as safer sexual practices relating to oral transmission of STIs among Transgender women with the aim of developing an mHealth educational intervention. **Methods:** The constructs of the Information, Motivation and Behavioural skills (IMB) theory was used as a framework to guide the thematic analysis which highlighted key areas of concern: 'Access to care', 'Role of support network', 'HIV/STI awareness', 'Perception of low risk', 'Attitudes and beliefs' and 'Socio-economic status'. Involvement and cooperation of local TGW community workers, activists and artists played a crucial role in the design and development of an educational intervention module aimed at raising awareness. The widely used ADDIE (analyse, devise, develop, implement, evaluate) model of instructional design was used for the development of the module. **Results:** Gaps were identified in awareness of oral transmission of STIs along with a general lack of condom use during oral sex. As a result; a unique, customized, culturally sensitive and peer reviewed mhealth educational intervention module was developed for delivery through a widely popular social media platform. The collaborative efforts helped to create content in the form of posts, stories and reels centred on the health and needs of transgender women. **Conclusion:** The study emphasizes the importance of collaboration with key partners within the local community to create a unique tool for the community by the community. Role of social support in positively influencing health promotion and health care utilization is also highlighted.

**Keywords:** Transgender women, oral health care utilization, oral transmission of STIs

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## 76. THE ROLE OF PARTICIPATORY RESEARCH IN THE DESIGN AND DEVELOPMENT OF A CULTURALLY SENSITIVE, TAILOR-MADE EDUCATIONAL INITIATIVE FOR TRANSGENDER WOMEN IN MALAYSIA

*Telang LA, Daud HS, Cotter AG, Rashid A*

**Background:** Transgender women in Malaysia are marginalized and face barriers in accessing health care. Low oral health care utilization along with gaps in knowledge and perceived low risk of transmission of STIs through oral sexual practices have been identified through formative research. Tailored educational interventions focusing on the needs of transgender women in Malaysia are crucial for addressing these gaps. **Methods:** Employment of the ADDIE (analyse, design, develop, implement and evaluate) instructional framework and participant involvement and engagement (PPIE) of the transgender community in the design and development of a social media (Instagram®) based educational intervention, Ms Radiance is described. Pilot implementation of the intervention on Instagram® for a 3-week period was evaluated with an online pre-test/post-test study of a single group of transgender women (n=30) participants along with assessment of feasibility and accessibility. **Results:** Areas of concern identified through formative research were used to derive research objectives of the intervention and mapped to the educational content. PPIE was vital in ensuring that the educational content was delivered as artistic posts, stories and reels that were bilingual, peer-reviewed and culturally competent. Ms Radiance was feasible (100% retention, 93% post-intervention completion rate) and acceptable (positive post-intervention feedback and 79% indicated recommending the intervention to others). **Conclusion:** A first of its kind intervention for transgender women in Malaysia was designed and developed with PPIE and pilot tested. The feedback from the pilot will help in improving the intervention for a scaled-up version of the study.

**Keywords:** Transgender women, oral health care utilization, oral transmission of STIs, ADDIE, PPIE

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## 77. CHALLENGES IN IMPLEMENTING THE PRESCHOOL ORAL HEALTHCARE PROGRAMME (POHP) IN SELANGOR AND RECOMMENDATIONS FOR IMPROVEMENT: INSIGHTS FROM PRESCHOOL TEACHERS

*Nurdin MF, Yusof ZY, Masrom H*

**Background:** Preschools offer an effective environment to promote oral health among young children. In 1984, the Ministry of Health (MOH) Malaysia launched the Preschool Oral Healthcare Programme (POHP) to enhance the oral health of children aged 5 to 6 years. Despite the long-standing implementation of this program, no evaluation has been conducted to identify the challenges faced by preschool teachers in its execution. **Objectives:** This study aimed to identify the obstacles in implementing the POHP and gather suggestions for improving oral health-related activities (OHRA) and oral health-related facilities (OHRF) in preschools across Selangor from the perspective of preschool teachers. **Methods:** This qualitative study involved conducting in-depth interviews (IDIs) with preschool teachers from four districts in Selangor. The interviews were guided by a schedule developed by the researcher in collaboration with a dental public health specialist (DPHS). The collected data were transcribed verbatim and analyzed using the framework method. **Results:** A total of 15 preschool teachers participated in the IDIs. Six primary themes emerged as challenges to implementing OHRA and OHRF. These themes were; a) lack of financial support, b) insufficient oral health learning materials, c) limited space, d) uncooperative children, e) environmental factors and f) uncooperative parents. For recommendations to improve the program, the primary themes were; a) provide oral hygiene kits and educational materials, b) improve storage for oral hygiene kits and designated tooth brushing areas, c) enhance parental involvement, d) increase the frequency of oral health seminars for teachers, e) offer financial support for oral health initiatives and f) organize oral health education exhibitions at preschools. **Conclusion:** The POHP in Selangor has positively impacted creating supportive oral health environments in preschools. However, further enhancements are necessary, particularly in providing comprehensive support, adequate resources, greater parental involvement, and improved infrastructure, to bolster the program's effectiveness.

**Keywords:** Preschools, teachers, oral healthcare programme, process evaluations

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## 78. EXPLORING YOUNG ADULTS' PERCEPTIONS OF ORAL HEALTH PROMOTION ON SOCIAL MEDIA IN MALAYSIA

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**Introduction:** Social media has emerged as a powerful tool for communication and health promotion, enabling health professionals to connect and interact with broad audiences in real-time. In recent years, many efforts have been made to enhance oral health promotion activities in Malaysia using social media. However, there is a lack of qualitative data to assess the users' perspective and impact experience of this approach. **Objectives:** This study aimed to explore perception, perceived impacts, and suggestions for improving oral health promotion on social media among Malaysian young adults. **Methods:** This qualitative study used semi-structured interviews with young adults aged between 20 and 35. Purposive sampling ensured diverse representation across several states in Malaysia. In total, twenty interviews were recorded and transcribed verbatim. Data were analysed using thematic analysis with Atlas.ti software. **Results:** The young adults revealed multifaceted views regarding oral health promotion activities on social media. Most participants preferred visually appealing content, like videos and infographics, using simple terms preferably in the national language. They also perceived oral health professionals as a more trusted source of information on social media but acknowledged the advantage of using influencers and celebrities. Some participants only passively engaged with oral health-related content, however, most believed that social media interventions positively impacted their oral health knowledge and awareness. To an extent, several participants also highlighted some behavioural impact. The participants raised the suggestion of multisectoral collaboration, strategic social media training of healthcare personnel, and improvement of social media content. **Conclusion:** These findings provide valuable insights into user experiences with oral health information on social media. Considering this finding, policymakers and social media managers can develop better strategies to use social media effectively to promote and raise public awareness about oral health.

**Keywords:** Social media, oral health promotion, young adult

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## 79. CULTIVATING EMPATHY AMONG DENTAL STUDENTS THROUGH VIRTUAL LIFE-STORY NARRATIVES

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**Background:** Empathy is essential for healthcare professionals, particularly in dentistry, where patient-centered care significantly improves clinical outcomes. Alternative teaching methods, like service learning and intergenerational engagement, have been shown to affect empathy levels across various disciplines. However, many of these approaches involve face-to-face interactions and fieldwork which were challenging to implement amid the Covid-19 Pandemic. This highlights a significant gap in the available traditional methods to foster empathy. Therefore, this study aims to examine if virtual life-story documentation of older adults can increase empathy among dental students. **Methods:** A mixed-method pre-experimental study was conducted with 17 undergraduate dental students from Universiti Malaya. They participated in an eight-week online empathy training program. Each student was paired with an older adult and tasked with creating a multimodal life-story biography. Data was collected using pre- and post-intervention Toronto Empathy Questionnaire (TEQ) scores, and reflective vlogs were recorded at three stages (beginning, midpoint, and end). Reflexive thematic analysis was conducted on the vlogs to explore qualitative changes in students' empathy levels and perceptions of aging. Mode of conduct was via a virtual platform (Microsoft Teams) at the Faculty of Dentistry, University Malaya, between December 2019 -November 2021. **Results:** Five primary themes emerged from the qualitative analysis: Shifting Perceptions of Aging, Empathy Building Through Life-Story Documentation, Challenges and Adaptations in Virtual Communication, Emotional Growth, and Positive Feedback on the Empathy Training Approach. At first, students found it challenging to communicate effectively online, but over time, they became more comfortable and engaged meaningfully with their older partners. They also learned to navigate sensitive stories, which enhanced their emotional intelligence and empathy. Narrative and reflective engagement provided students with a holistic view of patient care, emphasizing the importance of social determinants of health. No significant changes were reported in the TEQ scores, the baseline TEQ score was: a mean of 34.65 ( $\pm$  2.572); after training the TEQ scored a mean of 34.71 ( $\pm$  3.037). Despite no significant quantitative changes in TEQ scores, qualitative data provides insights into students' perspectives on aging and understanding of older adults. Subsequently, the feedback provided by the students on the empathy training approach for future adoption in educational curricula indicates a strong integrative knowledge translation strategy. **Discussion:** Our findings indicate that by integrating such empathy-focused activities into the curriculum for dental trainees, dental schools can prepare their students better to meet the varied needs of their future patients. It is, therefore, emphasized that a more comprehensive assessment tool is needed to measure the total range of empathy dimensions, including the cognitive and reflective ones. We hope that further research will explore the extended effects these virtual interventions have on clinical practice in years to come and develop increasingly sophisticated educational strategies to foster enhanced empathy in healthcare professionals. As healthcare increasingly moves toward digital and hybrid learning, these innovative approaches can better prepare students for the realities of modern clinical practice.

**Keywords:** Empathy, dental education, virtual learning

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## 80. ASSOCIATION BETWEEN ORAL HEALTH LITERACY AND ORAL HEALTH PRACTICE

*Kamal NS, Ramlay MZ, Mohd Arif BM, Kamarozaman DMS, Saidin NI*

**Introduction:** Health literacy empowers individual to use health information effectively. Adequate health literacy results in better health decision-making. The aim of this study is to determine the relationship between OH literacy (OHL) and oral health practice (OHP) among patients attending government dental clinics in Seremban. **Methods:** A validated questionnaire OHLI-M was used. The first part of OHLI-M was self-administered by the participants, while the second part was conducted via face-to-face interview. Information about patients' sociodemographic profile, OHL and OHP were collected. OHP was evaluated on frequency of brushing, type of bristle, toothpaste and dental aid used. The relationship was tested using One-way ANOVA in SPSS. **Results:** Out of 199 participants, more than half (65.5%) has adequate level of OHL. Majority (94.0%) had good practice on frequency of toothbrushing habit. 49.7% of respondents used soft bristle toothbrush which is a sign of good OHP. Majority (86.9%) used fluoridated toothpaste. All participants reported the use of dental aid such as dental floss, mouthwash, and toothpick. In general, OHL was found to be significantly associated OHP (0.021,  $p < .05$ ). OHL was significant with frequency of toothbrushing (0.045,  $p < .05$ ) and type of bristle used (0.024,  $p < .05$ ). No significant association found between OHL and type of toothpaste and use of dental aid. **Conclusion:** Patients with higher OHL has better OHP in terms of frequency of toothbrushing and type of bristle used. An understanding of participants' oral health literacy levels is crucial for designing effective health educational materials and creating intervention programs to promote oral health.

**Keywords:** Oral health literacy, oral health practice, dental patients

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## 81. THE RELATIONSHIP BETWEEN PERIODONTAL KNOWLEDGE AND ORAL HYGIENE BEHAVIOR WITH PERIODONTAL STATUS AMONG PATIENTS IN GOVERNMENT PRIMARY CARE DENTAL CLINICS IN JELEBU: A PILOT STUDY

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**Introduction:** Periodontal knowledge was found to affect oral hygiene behavior and routine periodontal care by the dentist. Adequate periodontal knowledge acquisition and instilling oral hygiene behavior are crucial to curb periodontal diseases in population. **Objectives:** To assess the association between patients' periodontal knowledge and oral hygiene behavior with their periodontal health status. **Methods:** This study describes the development of an English and Malay questionnaire with forward-backward translation prior to a cross-sectional study. The pilot study was conducted in 4 primary dental clinics in Jelebu district using simple random sampling method by inviting the 1st, 5th, and 8th patient who fulfills inclusion criteria to answer a self-administered questionnaire. Test-retest reliability was carried out 1 week after. Responses and BPE scores for periodontal health status were recorded into Microsoft Excel. Validity and reliability tests were done using SPSS. **Results:** 80 samples were collected for the pilot study. Cronbach's alpha was 0.825 and ICC was 0.901 indicating adequate reliability. Hypotheses developed to test validity were confirmed. Majority of the sample size were considered to have poor oral hygiene behaviors (77.5%) and moderate to poor periodontal knowledge (87.5%). This corresponds to their periodontal health status (BPE score) which found 96.3% with unhealthy periodontium (BPE $\neq$ 0). Significant gender differences in periodontal knowledge indicate the need to consider gender-specific approaches in educational interventions. No significant associations were found between other sociodemographic variables (Ethnicity and Household income) and periodontal knowledge, or between oral hygiene behavior and periodontal health status. **Conclusion:** Oral hygiene behavior and oral health knowledge are significant factors in predicting periodontal health status. This questionnaire was found to be valid and reliable and appropriate for use in cross-sectional studies for Malaysian adult population. Educational interventions should be targeted to improve oral hygiene behaviors and periodontal knowledge.

**Keywords:** Oral health knowledge, oral hygiene behavior, periodontal health status

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## 82. EFFECTIVENESS OF ORAL HEALTH EDUCATIONAL INTERVENTION AMONG PATIENTS WITH MENTAL DISORDERS IN COMMUNITY MENTAL HEALTH CENTRE

*Bab NB, Yusof N, Mohd Radzi NA, Mohamed S*

**Background:** People with mental disorders (PMD) are more likely to experience poor oral health outcomes due to side effects of psychotropic medications, poor self-care and barriers in accessing dental services. The rising prevalence of people experiencing mental disorders brought attention to the emerging opportunities for oral health interventions among PMD. **Objectives:** This study aimed to investigate the perceived oral conditions among PMD and to evaluate the effectiveness of oral health educational intervention on oral health knowledge and practices for PMD. **Methods:** This study employed a quasi-experimental design conducted in the Community Mental Health Centre (MENTARI). A total of 120 participants were involved consisting of intervention and control groups. An educational booklet was developed to aid oral health intervention among PMD in this study comprising tailored oral health care information. Data collection points were at baseline, post 2-weeks and 4-week intervention using a validated pre and post-questionnaire. The outcomes measured were improved oral health knowledge, self-reported practices and participants' feedback on the educational intervention. **Results:** The intervention group showed 0.098 increased odds of having improved knowledge compared to the control group ( $p < 0.05$ ). While the intervention appeared to have a marginal effect on reducing positive health behaviours, the lack of statistical significance suggests that the observed difference could be due to chance. Even though the findings showed a minimal effect of the intervention given, the participants highlighted positive feedback on the oral health education provided at MENTARI. These include improvement in their knowledge and awareness about oral health and the intervention should be continued at the psychiatric facilities. **Conclusion:** This study underscores the importance of tailored educational interventions in promoting oral health and overall well-being among PMD. The findings have implications for healthcare providers and policymakers to address the oral health needs faced by this vulnerable population.

**Keywords:** Dental education, mental health, mental illness, oral health intervention

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### 83. TOBACCO CONTROL MONITORING IN MALAYSIA: KESIHATAN ORAL TANPA AMALAN MEROKOK (KOTAK)

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**Introduction:** KOTAK is a school-based programme for early detection, prevention and intervention in tobacco usage with the aim of reducing the prevalence of smokers among schoolchildren. This programme is implemented through visits to schools by dentists and dental therapists. This programme is an extension element of the existing Incremental Dental School Programme that targets primary and secondary school students throughout the country. Dental services at the school are conducted annually, which means that the same students will receive intervention and reinforcement of the no smoking message every year. Such an ongoing programme can contribute towards the formation of a tobacco-free Malaysian generation, or the Generational End Game (GEG).

**Methods:** A dentist or dental therapist will perform an oral examination to detect any dental problems and at the same time, carry out a screening of smoking habits among the schoolchildren. If a smoker is detected, the student will be given appropriate intervention. Prior to that, oral health education, such as talks, will be given to the schoolchildren. In these talks, apart from imparting knowledge about oral health, the dangers of smoking are also emphasized. Regular visits to the school are important to ensure continuous monitoring and sustainability. The percentage of schoolchildren screened for smoking is increasing from 2016 to 2019 (78.9% of primary schoolchildren were screened in 2016 and 99.36% in 2019. 75.27% of secondary schoolchildren have been screened in 2016 and 97.43% in 2019). This trend decreased significantly in 2020 and 2021 due to school closures during the COVID19 pandemic. After the screening and prevention activities for all categories, the focus is on the intervention for identified smokers that have been detected. The goal is for the schoolchildren to have at least a quit date. **Results:** For the intervention among the primary schoolchildren, in 2018, 87% of active smokers had undergone intervention and 58% of them have quit date. For 2019, 94.4% of active smokers had undergone intervention while 64.6% of them have quit date. For secondary schoolchildren, in 2018, 86.9% undergone intervention and 32.8% of them had quit date. In 2019, 63,763 smokers were identified and 54,634 (that is 85.7%) undergone intervention and 17,767 (that is 32.5%) had quit date. In 2022, The usage of electronic cigarettes (that's include vape) were 254 among primary schoolchildren and 17,931 among secondary schoolchildren. **Conclusion:** The KOTAK programme through school dental services has a potential to prevent smoking habits among schoolchildren and this initiative needs to be continued and strengthened in order to achieve a smoke-free country by 2045.

**Keywords:** KOTAK, screening smoking habit, prevention and intervention in tobacco usage among school children

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## 84. THE USE OF DIGITAL ANNOTATION TOOLS IN IMPROVING ONLINE PUBLIC HEALTH LITERACY AMONG YOUTHS

*Azmuddin RA, Dom TN, Rani H, Rahman AN, Hamat A*

Understanding public health materials is important to enhance public health literacy, as the lack of comprehension can have negative repercussions for individuals, society, and the healthcare system. It is essential for youths to grasp fundamental health information because it equips them with the knowledge and ability to address the intricate health needs and challenges of modern society. This study was conducted to assess the reading comprehension ability of youths when engaging with online public health materials in English, with a particular focus on diabetes. For this purpose, the research utilised Digital Annotation Tools (DAT) within an online reading system named Interactive Reading for Academic Disciplines (iREAD). Data were collected from a purposive sample of 30 students enrolled at a Malaysian public university. The students read 12 newspaper articles over the course of four weeks. Content analysis was conducted to analyse the annotations made by students while reading the articles. Both quantitative and qualitative approaches were employed to analyse the data. Analyses of the annotations indicate that students were able to paraphrase, summarise, synthesise, and contextualise ideas while engaging with the articles. The findings revealed that DAT has the potential to improve the understanding of online diabetes health education materials. This is a crucial development towards the increase in health knowledge and literacy as enhanced comprehension may, in turn, lead to increased health knowledge and empower individuals to make informed decisions about their health and well-being, ultimately contributing to higher levels of health literacy.

**Keywords:** Health literacy, type 2 diabetes mellitus (T2DM), public health materials, digital annotation tools, annotation types

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## 85. SIWAK AS A PROPHETIC AND EVIDENCE-BASED ORAL HYGIENE TOOL: A QUALITATIVE STUDY AMONG ISLAMIC SCHOLARS

*Ramli H, Said SM, Ismail AM, Dom TN*

Oral hygiene care and practice, siwak, which adopts Prophet Muhammad's (Peace be upon Him, hereafter, PBUH) sunnah, remains unclear. As such, this study aims to explore and critically appraise the Prophetic practice of siwak according to Islamic literature, and in the light of current clinical evidence to clarify siwak as the oral hygiene practice prescribed by the Prophet (PBUH). Semi-structured one-to-one interviews were conducted among local contemporary Islamic scholars. The questions prepared were based on literature review and focused on toothcleaning practices of the Prophet (PBUH) as well as how the siwak was prepared and kept, as reported in documented narrations. Interview transcripts were analysed using thematic approach while content analysis of the referred narrations of hadith was made to provide a triangulation of the overall siwak use framework. The investigation revealed that horizontal tooth-brushing was highly recommended, and that al-Arak tree sticks are preferred to be 1) specifically prepared, 2) held steadily in the right hand, 3) used between two to five minutes depending on the goal, and 4) hygienically stored. It was also found that improper siwak practice may significantly suppress the clinical advantages. Thus, these findings substantiate future evidence-based guidelines on optimal oral hygiene care for siwak user based on authentic Islamic source.

**Keywords:** Oral health, siwak practice, religious beliefs, hadith, oral hygiene

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## 86. IS SIWAK (CHEWING STICK) AN EFFECTIVE ORAL HYGIENE PRACTICE IN MODERN SOCIETY?

*Dom TN, Ramli H, Said SM, Ismail AM*

**Introduction:** Islamic religion emphasised siwak (chewing stick) use as tooth and mouth cleaning tool, but the practice that modelled towards the Prophet's Muhammad, peace be upon him (PBUH) behaviour is unclear. A study was conducted via individual semi-structured interviews, aimed to explore and map various aspects of the siwak practice from the perspective of contemporary Muslim scholars. These experts concurred that current siwak users vary in their observance towards the purpose, handling and timing of the siwak routine. It is a concern that deviations from the Prophet's actual practices may limit the advantages of siwak, cause adverse effects on oral tissues and falsely portray siwak as an inferior option among modern communities. Findings from this study are derived from a triangulation of literatures and modern-day scholars' interpretation which may be used as a basis for developing future guidelines on effective and safe siwak practice that is well-fitted to contemporary modern lifestyle.

**Keywords:** Siwak practice, Prophet's practice, religious belief, Muslim scholars, oral hygiene

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## 87. THE ASSOCIATION BETWEEN ORAL HEALTH LITERACY (OHL) AND ORAL HEALTH STATUS (OHS) AMONG ADULT PATIENTS - A LITERATURE REVIEW

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**Background:** A good knowledge on oral health plays an important role in maintaining the good oral health status of a community. There are many reasons that can affected an individual health literacy level, most commonly being associated with education level, language, culture and environmental setting. The literature reviewed within this paper all studied association between oral health literacy and oral health status of adult patients. **Objectives:** The objective of this study was to assess the association between oral health literacy (OHL) and oral health status (OHS) of different socio-demographic population. **Methodology:** A literature review will be carried out to identify relevant studies reporting data on the correlation of oral health literacy (OHL) with oral health status (OHS) of the adult patients. Thirty previous articles, literature and research studies which studied the effects of oral health literacy (OHL) towards and individual oral health status (OHS) gathered. The PubMed database was searched using the Medical Subject Headings (MeSH). Oral health literacy and oral health status will be used in the search strategies. Articles will be included in the review if they complied with the inclusion criteria. Full texts of the selected articles will be analysed. Taking the included studies, and consistent with the fourth and fifth stages of Arksey and O'Malley's framework, a chronological overview of the current tools used to measure oral health literacy developed. The studies charted and summarized into Microsoft Excel. **Results:** Evaluating the results of previously conducted studies, the literature review revealed that there is a significant association between oral health literacy (OHL) and oral health status (OHS). **Conclusion:** In conclusion studies showed significant relationship between Oral Health Literacy and Oral Health Status. Improving oral health literacy has shown improvement if oral health status and oral health outcomes.

**Keywords:** Oral health literacy, oral health status

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## 88. IMPACT OF COMMUNITY WATER FLUORIDATION ON CARIES INCREMENT AND TREATMENT COSTS IN SCHOOLCHILDREN: A COMPARISON BETWEEN PERAK AND PAHANG

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**Background:** The cessation of community water fluoridation (CWF) since 2012 resulted in an increase in caries prevalence among schoolchildren in Pahang, but the rate of caries progression and its impact on caries related treatment costs remain largely unknown. **Objectives:** To compare the caries increment and cost of caries related treatment in permanent dentition among schoolchildren without CWF in Pahang and with CWF in Perak. **Methods:** This retrospective cohort study used secondary data from school dental records in Pahang and Perak from 2015 to 2019. Schoolchildren, initially aged eight in 2015, were followed until age 12 in 2019. Caries was recorded using the Decayed, Missing, Filled (DMF) index. The data was used for cost analysis of caries related treatments from the healthcare provider's perspective, specifically the Ministry of Health Malaysia. Cost estimates were extracted from the fee schedule [Fees (Medical) (Cost of Services) Order 2014] for caries-related treatment costs, presented in 2015 Malaysian Ringgit (MYR) with a 3.00% discount rate. Descriptive statistics, independent t-tests, and negative binomial regression were used to analyse the data with SPSS 22.0. **Results:** The sample included 462 school dental records from both states. Caries increment in permanent dentition was significantly higher in Pahang ( $M=0.83$ ,  $SD=\pm 1.50$  and  $M=1.00$ ,  $SD=\pm 2.10$ ) than in Perak ( $M=0.18$ ,  $SD=\pm 0.53$  and  $M=0.22$ ,  $SD=\pm 0.66$ ) from 2015-2019 ( $p<0.001$ ). After controlling for confounders, the presence of CWF remained a strong predictor of caries increment over five years. Caries-related treatment costs were significantly higher among schoolchildren without CWF in Pahang ( $M=79.71$ ,  $SD=\pm 144.62$ ) compared to those with CWF in Perak ( $M=14.04$ ,  $SD=\pm 44.57$ ) from 2015 to 2019 ( $p<0.001$ ). **Conclusion:** The findings indicate the positive impact of the CWF programme in reducing caries and the cost of caries-related treatment in the presence of exposure to other fluoride sources. This may assist policymakers in supporting the reimplementation of CWF in Pahang.

**Keywords:** Caries increment, community water fluoridation, cost of caries related treatment

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## 89. THE EFFECT OF THE DIFFERENT NUMBER OF TOPICS IN EDUCATIONAL VIDEO ON ORAL HEALTH STATUS OF PRESCHOOL CHILDREN: STUDY PROTOCOL FOR A CLUSTER RANDOMIZED CONTROLLED TRIAL

*Mohd Jaini SNB, Sinor MZ, Ahmad B, Sanusi SY, Hassan R*

**Background:** Dental plaque, caries and gingivitis among preschool children remain prevalent although oral health education (OHE) program implemented since years ago. Effective toothbrushing technique, consumption of sugary food and literacy on dental caries are identified as attributing factor. Analysis on OHE, particularly on the number of topics delivered helps in revised as well as leads to the answer on how to implement this program more effectively. In this study, participants given the educational video show focused on topic of effective toothbrushing technique (TB), consumption of sugary food (Sugary) and literacy on dental caries (Caries) used in multiple approach to improve OH status, knowledge, attitude, and practice compared to placebo video. **Objective:** The aim is to compare the effect of different number of topics in educational video in oral health status of children aged five to six years old in Kota Bharu, Kelantan. Ten classes with 124 children involved. **Methods:** This is the phase I interventional cluster randomized controlled trial with multiple-arm parallel group assignment and single blinded masking for prevention of dental caries and gingivitis among preschool children. A cluster randomization using sealed enveloped technique used to randomly allocate into five groups. The intervention group are GI1 (1 topic: TB), GI2 (2 topics: TB + Sugary), GI3 (2 topics: TB + Caries), GI4 (3 topics: TB + Sugary + Caries). Control group, GC is receiving placebo video. The trial lasts for 4 months. Primary outcome is mean plaque and gingivitis score change after 4 months. To determine the feasibility of the educational video, a validation and evaluation process conducted. **Results:** Cluster randomisation may lead to a random effect and cluster selection bias which was accounted during data analysis and interpretation. The effectiveness of each approach was evaluated by comparing the results with baseline and placebo video.

**Keywords:** Oral health, health education, preschool children, randomized controlled trial, dental plaque

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## 90. EFFECTIVENESS OF EDUCATIONAL VIDEOS COMPARING SINGLE VERSUS MULTIPLE TOPICS: A CLUSTER RANDOMIZED CONTROLLED TRIAL

*Mohd Jaini SNB, Sinor MZ, Ahmad B, Hasan R, Sanusi SY*

**Background:** Dental caries and gingivitis are preventable diseases that remain highly prevalent among children globally and, while transmissible through the transfer of oral bacteria typically from mother to child, differ from communicable diseases that are spread through direct contact, air, or vectors. Unlike communicable diseases, dental caries and gingivitis can be effectively prevented through proper oral hygiene practices and dietary modifications. Oral health education (OHE) intends to improve oral hygiene practices and reduce oral health problems. However, evidence of the impact of multiple topics in OHE on preschool children is lacking. This study aimed to examine the effects of single- versus multiple-topic OHE delivered via video presentations on the plaque and gingival status of preschool children. **Methods:** A parallel five-arm cluster randomized controlled trial was conducted on healthy preschool children aged five and six years. Children with chronic illnesses, disabilities, or conditions that could affect their oral health or ability to participate in the OHE intervention were excluded. OHE interventions were given to children from eight of the 10 classes assigned as intervention groups, while two classes served as the control group and received no intervention. The intervention groups received one, two, or three oral health topics using specially developed animation videos, in Malay language: toothbrushing technique (T), toothbrushing technique and the effects of sugar consumption on oral health (TS), toothbrushing technique and pathogenesis of dental caries and gingivitis (TP), and toothbrushing technique, the effects of sugar consumption on oral health, and pathogenesis of dental caries and gingivitis (TSP). Plaque and gingival scores, along with oral health knowledge, attitude, and skills (KAS), were recorded before and after the intervention. The CONSORT guidelines were followed in reporting. The analyses included descriptive statistics, one-way ANOVA, effect sizes, and multivariate analysis of covariance (MANCOVA) at a 5% significance level. **Results:** A total of 160 participants were equally distributed into five groups ( $n = 32$ ). There were no baseline differences in plaque or gingival scores. All groups showed significantly lower plaque and gingival scores post-intervention ( $p < 0.05$ ), with effect sizes ranging from -1.1 to -0.7. No changes in oral health (KAS) were observed. The intervention groups had significantly lower plaque and gingival scores compared to the control group ( $p < 0.05$ ), but no differences were found between them after adjusting for baseline KAS ( $p > 0.05$ ). **Conclusions:** This study suggests that including multiple topics in OHE programs for preschool children may not necessarily improve oral health outcomes. Simplified OHE may be more advantageous in terms of time, cost, human resources, and organization.

**Keywords:** Toothbrushing, sugar, dental caries, oral health, education

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## **DOMAIN 3**

# **Access to Oral Healthcare**

ACCESS

## 91. EXPLORING THE PERSPECTIVE OF SUPERVISORS REGARDING THE COMPETENCY AND PREPAREDNESS OF NEW DENTAL OFFICERS (NDOS) IN PROVIDING HOLISTIC CARE

*Siti Zuriana MZ*

**Introduction:** In the Ministry of Health (MOH) Malaysia, as in many other countries, concerns have been raised regarding the competencies of New Dental Officers (NDOs). Therefore, steps have been taken to ensure they are competent while delivering their tasks nationwide. This includes revising the one-year training program called the New Dental Officers Programme (NDOP), conducting audits and surveys at the point of care, among other measures. Any weaknesses in their competencies should be addressed immediately to ensure optimum care is given to patients.

**Keywords:** Competency, New Dental Officers, holistic care

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## 92. PREVALENCE OF WORK-RELATED MUSCULOSKELETAL DISORDERS AND ITS ASSOCIATED FACTORS AMONG ORAL HEALTHCARE PERSONNEL IN PRIMARY DENTAL CLINICS IN PERAK: A CROSS-SECTIONAL STUDY

Zawin Anuar NA, Hew PF, Azmi NA, Fauzi NF

**Introduction:** Dentistry, like other occupational sectors, is exposed to various risks and occupational diseases. This includes ergonomic hazards which can cause musculoskeletal problems. Work related musculoskeletal disorders are caused by prolonged exposure to ergonomic hazards and difficult to be diagnosed as it is a chronic condition. The count of reporting in dentistry is still low as it is under reported. **Objectives:** This study aimed to determine the prevalence of WRMSD among oral healthcare personnel in Primary Dental Clinics in Perak and to find any association with other measured factors. **Methodology:** A cross-sectional study was done during the period of June till September 2022. Sample size was calculated using Single Proportion Formula. Samples were chosen from dentists, dental therapists, dental surgery assistants and dental attendants in 15 primary dental clinics in Perak. All samples who fulfilled the inclusion and exclusion criteria were included in the study. Nordic Musculoskeletal Discomfort Questionnaire was used and demographic data from respondents were captured. All data were entered and analyzed using SPSS version 25. Data on numerical variables were expressed by mean and standard deviation. Categorical variables were described using frequency and percentage for descriptive analysis. Association of WRMSD and its factors were analyzed using Pearson's Correlation & Independent T-Test. **Results:** 362 respondents who fulfilled the inclusion and exclusion criteria were included in the study. Almost half of the respondents were dentists (43.9%), majority of them were female (78.5%), Malay (71.3%), right-handed (90.1%) and married (69.6%). The mean age of the respondents was 34.9+7.4, while mean years of services for them was 9.97+7.5. The mean BMI for the respondents was 25.97 + 5.9. Most of the respondents were taught regarding ergonomics during their study period (84.3%), while 74.8% of them claimed they had joined any ergonomic courses during their working period. Neck region was found to be the highest prevalence of WRMSD (58%), followed by shoulder (48.1%), upper back (42%), lower back (40.6%) hand/wrist (31.5%). Younger respondents were found to be more associated with neck, shoulder and lower back pain while older personnel were found to be having association with elbow, knee and ankle/feet pain ( $p<0.05$ ). BMI also was found to be related with knee and ankle/feet pain ( $p<0.05$ ). **Conclusion:** Prevalence of WRMSD among oral healthcare personnel in Perak was found to be high. Age, years of services and BMI was found to be associated with WRMSD. Early intervention need to be formulated as soon as possible as its affecting the patients' quality of care.

**Keywords:** Ergonomic, dental, dentistry, WMSD, musculoskeletal disorder

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### 93. TRANSLATION, CROSS-CULTURAL ADAPTATION, AND VALIDATION OF THE MALAY VERSION OF THE ERGODENT QUESTIONNAIRE

*Ali NS, Fauzi NF*

**Introduction and Objectives:** Work-related musculoskeletal disorders (WRMSD) are one of the occupational diseases widely affecting dental personnel, especially dentists and dental therapists. It can be multifactorial, including its relationship with their knowledge, attitude, and practice of ergonomics in dentistry. ErgoDent Questionnaire was developed in 2019, aiming to measure knowledge, attitude & practice of ergonomic in dentistry among dental students. The occurrence of WRMSD was shown to be widely affecting more on currently practicing dentists and dental therapists, hence, it is essential to adapt the questionnaire, and since majority of them are native Malay speakers, thus, translation of the questionnaire to Malay language is important for them to understand more so that the measurement can be more accurate. **Methodology:** Forward and backward translation of the questionnaire were done by group of translators whom were native Malay speakers with English as their second language. A newly translated draft version of ErgoDent Questionnaire was then gone through Content Validation of 6 experts, and Face Validation of 13 target users. Reliability test was done before the final version of Malay version of ErgoDent Questionnaire was produced. **Results:** The newly translated tool showed item-level content validity index (I-CVI) of 0.83 and item-level face validity index (I-FVI) of 0.96 was also obtained from 13 respondents, showing that the items were clear, understandable, and comprehensible. Cronbach's Alpha value for the newly Malay translated ErgoDent Questionnaire was 0.73, which was acceptable. **Conclusion:** The Malay translated version of ErgoDent Questionnaire is considered valid and to be used for assessment of knowledge, attitude, and practice of ergonomic in dentistry especially among dental personnel in Malaysia. However, further improvement can be done to increase the psychometric value in the future.

**Keywords:** Ergonomic, dental, dentistry, work-related musculoskeletal disorder, WMSD

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#### 94. ASSOCIATION OF PHYSICAL & WORKING ACTIVITIES WITH WORK-RELATED MUSCULOSKELETAL DISORDERS (WRMSD): A CROSS-SECTIONAL STUDY AMONG DENTISTS & DENTAL THERAPISTS IN PRIMARY DENTAL CLINICS IN PERAK

Ali NS, Fauzi NF

**Introduction:** Work-related musculoskeletal pain is a worrisome problem that can affect both quality of work and life. Physical activities may help in easing the pain, while more workload may increase the symptoms. **Objectives:** This study aimed on determining the prevalence of Work-related Musculoskeletal Disorder (WRMSD) and its pain score, physical/working activities of the respondents and to find association between these variables. **Methodology:** A cross sectional study was commenced from June till September 2022. 15 primary dental clinics with the attendance of 50 patients/day were chosen and universal sampling was used. Data were collected using combination of Nordic Musculoskeletal Discomfort Form, MOH Pain Scale; BM-short version of International Physical Activities Questionnaire (IPAQ) and Malay version of ErgoDent Questionnaire. Numerical data presented descriptively using mean+SD or median(IQR), while logistic/linear regression was used to find association between physical/working activities with WRMSD and its symptoms. **Results:** 217 dentists & dental therapists were sampled. The highest prevalence of WRMSD was at neck region (76.5%), followed by shoulder (65.4%), upper (57.6%) & lower back (56.2%) region. Highest pain score was found to be at lower back pain region (4.35+2.14). The respondents spent 17.21+14.58 hours/week doing clinical works & treated 15.01+7.56 patients per day. They were also found to be sitting for median of 3 hours/week (IQR: 5.50) and doing Moderate-Vigorous Physical Activity (MVPA) for median of 2 hours/week (IQR: 4.00). Treating more patients is associated with increased of Relative Risk (RR) of getting upper back pain by 39% ( $p = 0.046$ ). Increased 1 Standard Deviation (SD) of MVPA would decrease 0.156 SD of pain score at ankle/feet region ( $p = 0.022$ ), while increased 1SD of sitting time would increase 0.505 SD of pain score at thigh region ( $p = 0.023$ ). **Conclusion:** Working activities was found to be significantly contributing to WRMSD and doing physical activities can help in easing the pain while increased of sedentary activity would worsen WRMSD symptoms.

**Keywords:** Dentistry, ergonomic, occupational health, physical activities, workplace safety

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## 95. RETROSPECTIVE DATA ANALYSIS OF REFERRAL LETTERS FOR OROFACIAL VASCULAR ANOMALIES TO A TERTIARY CENTER

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**Background:** Vascular anomalies are disorders of the vascular system. These anomalies are classified as either vascular tumors or vascular malformations, with each possessing distinct characteristics. This study was performed to analyze vascular anomaly referrals to a tertiary center, identify patterns of misdiagnosis, and create a proforma to ensure the comprehensiveness of clinical information. **Methods:** We retrospectively analyzed vascular anomaly referral letters received by Hospital Tunku Azizah from 2018 to 2023. Specifically, we descriptively analyzed the inclusion of vascular anomaly characteristics, the demographic profiles of referrers and patients, and basic clinical findings. Subsequently, we developed a redesigned proforma. **Results:** Overall, 47 referral letters were analyzed. The patients comprised 25 boys and 22 girls, with ages ranging from birth to 14 years. Patient name, sex, and date of birth, along with the referrer's name and address, were satisfactorily documented. The review revealed that 44 (93.6%) of the letters included the patient's presenting problem, 43 (91.5%) contained clinical findings, 37 (78.7%) reported diagnostic investigations, and 29 (61%) referenced medical history. Regarding characteristics of vascular conditions, over half of the letters detailed time of appearance (n= 40, 85%), growth (n= 24, 66%), complications (n= 25, 53.2%), color (n= 32, 68%), and shape (n= 34, 72%). However, fewer than half mentioned compressibility (n= 7, 14.8%), pulsation (n= 7, 14.7%), and associated conditions (n= 2, 4.3%), and none referenced involution. **Conclusion:** Although demographic data were generally well-documented, critical medical history information was frequently omitted, including a lack of adequate pre-referral investigations. Key characteristics of vascular anomalies, namely compressibility, pulsation, associated conditions, and involution, were frequently overlooked. Accurate documentation of these features is crucial for determining treatment urgency. A standardized proforma must be implemented to ensure that vital information is captured, thus facilitating diagnosis and optimizing patient care.

**Keywords:** Referral and consultation, vascular malformations, vascular neoplasms

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## 96. ASSESSING PATIENT'S SATISFACTION ON DENTAL SERVICE QUALITY USING MODIFIED SERVQUAL MODEL

*Ibrahim MS, Zulkiple N, Aris AA, Che Musa MF, Idris RI, Cheong JM*

**Introduction:** A quality dental service is crucial for ensuring oral health, fulfilling patient desires, satisfying needs, and providing optimal solutions regarding function, aesthetics, and maintenance of oral health. This study offers insight into patient satisfaction with the service quality at the students' polyclinic, Kulliyyah of Dentistry (KOD), IIUM. **Objective:** This study aims to investigate the satisfaction level of patients with the dental services provided at the students' polyclinic. **Methodology:** This cross-sectional study was conducted at the students' polyclinic, KOD, using modified SERVQUAL questionnaires. The SERVQUAL model includes five dimensions, which were expanded by four additional dimensions aligned with the Ministry of Health corporate culture. A total of 212 patients were selected using convenience sampling. Data were analyzed using IBM SPSS 28 through the Wilcoxon Signed Rank test. **Results:** The analysis revealed significant differences across the nine dimensions of service quality among patients. The patients' perceptions of the services provided exceeded their expectations in all nine domains. These positive gaps indicate overall satisfaction with the dental services at the students' polyclinic. **Conclusion:** In summary, patients at the students' polyclinic, KOD expressed a higher satisfaction level than expected. This underscores the importance of passionate and dedicated delivery of dental treatments to meet patient expectations. Continuous evaluation and targeted improvements, especially in tangibles and reliability, are essential for sustaining and enhancing patient satisfaction.

**Keywords:** SERVQUAL, dental services, expectation, perception, health service satisfaction

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## 97. A CROSS-SECTIONAL STUDY ON EARLY ORAL CANCER DETECTION IN HULU LANGAT : WHAT DO MEDICAL PRACTITIONERS KNOW?

*Musa ZA, Mohd Nabori FR, Abdullah NZ, Mohamad Mustaffa H, Shapiee NI, Roslan AN, Ab Aziz MH*

**Objectives:** To assess awareness and practice towards early detection of oral cancer among medical practitioners in Hulu Langat, Malaysia. **Methodology:** A cross-sectional study was conducted among 251 medical practitioners. The questionnaire used was adopted and adapted from previous study. It was validated before being distributed to respondents. Descriptive analysis was performed using SPSS. **Results:** About 70% of 251 Medical Practitioners participated in this study. Majority (99.4%) were aware of oral cancer. Most agreed that smoking, tobacco product used, betel quid chewing and excessive radiation exposure are the risk factors of oral cancer. However, 24.7% unaware that frequent alcohol consumption is also a risk factor. Only 25.8% knew that mucosal color changes and tongue numbness (38.2%) are the signs and symptoms of oral cancer. Half respondents identified palate (57.6%), cheeks (53.5%) and gums (51.2%) as the most common sites for oral cancer. Majority (60.0%) reported that they did inform patients regarding risk factors. However, they are unaware (52.9%) of various ways in detecting oral cancer and only 20.6% examine patients routinely for signs of oral cancer. Nevertheless, most do refer suspicious lesion to dental professional. More than half (62.4%) felt that they lacked competence in detecting oral cancer as they aren't attended (93.5%) any course in the past 5 years. **Conclusion:** Although evident knowledge gaps, the medical practitioners in Hulu Langat showed good practice towards oral cancer detection and prevention. Incorporating training on oral potentially malignant disorders and oral cancer detection into scheduled CPD activities could effectively address these gaps.

**Keywords:** Oral cancer, early detection, medical practitioner

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## 98. KNOWLEDGE, ATTITUDE AND PRACTICE OF PATIENTS TOWARDS ORTHODONTIC TREATMENT: A CROSS-SECTIONAL STUDY

*Mathew R, Sathasivam HP, Mohamednor L, Yugaraj P*

**Background:** Orthodontic treatment is a time-consuming and highly technique-sensitive clinical procedure. A patient's comprehension and compliance with oral hygiene instructions and appliance maintenance are critical to the success of orthodontic treatment. This study was performed to assess the knowledge, attitude and practice of patients seen at government orthodontic clinics in the Federal Territories of Kuala Lumpur and Putrajaya towards orthodontic treatment. **Methods:** A validated, bilingual, self-administered questionnaire comprising fifteen questions across the domains of Knowledge, Attitude and Practice was used and responses were assessed with 3 responses; one correct, one incorrect and one reflecting uncertainty. 507 patients from five orthodontic centres participated in this study. Data was analysed using SPSS. Continuous data was summarised as mean and standard deviation or median and inter-quartile range, as appropriate. Categorical data was summarised as frequency and percentage, then univariable analysis was carried out with Pearson's chi-square test or Fisher's exact test, as appropriate. **Results:** The mean age of respondents was 22.5 years (SD  $\pm$  2.8). A majority of respondents were female (64.1%) and from the lowest income bracket or B40 group (71%). Overall, for the knowledge domain, a majority of the respondents got all questions correct. 69.4% of patients were aware that incomplete treatment could lead to worsening of their malocclusion. 80.9% of respondents were aware of the need for a retainer upon completion of their orthodontic treatment. For the attitude section, 64.7% felt that they had to wait a very long time to see the orthodontist. In the Practice domain, the majority only got two of the five questions correct. Only 39.8% of respondents made an effort to alter dietary habits all of the time. In general, females and those with tertiary education fared better for all three domains. **Conclusions:** The orthodontic patients in the Federal Territories of Kuala Lumpur and Putrajaya possess good knowledge about their treatment however their attitude and orthodontic related practices need to be improved.

**Keywords:** Orthodontics, knowledge, attitude, practice, health behaviour

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## 99. CHALLENGES IN IMPLEMENTING ORAL HEALTHCARE PROGRAMME FOR ORANG ASLI IN SELANGOR AND SUGGESTIONS FOR IMPROVEMENT: THE IMPLEMENTERS' PERSPECTIVES

*Alias R, Nurdin MF, Omar K, Sanif NS, Masrom H, Rajandran M, Singh MSM, Arshad SB, Kamaruddin F*

**Introduction:** The oral healthcare programme for Orang Asli (OA) in Selangor covered 74 OA villages via mobile dental teams from district dental clinics and Hospital Orang Asli Gombak (HOAG). However, no study has been done to evaluate the challenges faced by the implementers while implementing this programme. **Objectives:** This study's objectives were to explore the challenges in implementing an oral healthcare programme for OA and suggest improvements from the implementers' perspectives. **Methods:** This was a qualitative study involving programme implementers from seven (7) districts in Selangor using focus group discussion (FGD) as the data collection method. The FGDs were conducted among the programme implementers using an interview schedule developed by the researcher and a dental public health specialist (DPHS). The data were transcribed verbatim, followed by thematic analysis using Microsoft Excel. Data collection was conducted until data saturation was reached. **Results:** A total of 39 respondents and seven (7) FGDs were conducted. From the analysis of the FGDs, five (5) themes were identified for the challenges in implementing oral healthcare programmes for OA in Selangor. These themes were: a) insufficient resources and infrastructures, b) lack of knowledge and awareness among the OA community, c) lack of cooperation from the OA community, d) dental fear and anxiety, and e) language barriers. Primary themes for suggestions for improvements were: a) improve communication skills to build trust, b) customized oral health promotion materials to cater for the OA community, c) improve programme planning and d) dedicated and optimised resources for outreach programmes. **Conclusion:** It was essential to identify the challenges in implementing an oral healthcare programme for marginalised communities as part of the evaluation process to improve the programme through proper planning, collaboration with various agencies and optimising available resources.

**Keywords:** Aborigines, orang asli, oral healthcare programme, oral health promotion, process evaluations

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## 100. ORAL CANCER DETECTION AND MEDICAL OFFICERS: KNOWLEDGE, ATTITUDE AND PRACTICE IN HULU LANGAT DISTRICT

*Shapiee NI, Musa ZA, Roslan AN, Ab Aziz MH*

**Introduction:** Medical officers have greater opportunity in helping early detection of oral cancer, which is essential to increase patient survivability and delaying its prognosis. Knowledge, attitude and practice in oral cancer detection among medical officers are crucial, as they served as the first line of defense in primary health care setting. **Aims:** To assess knowledge, attitude, and practice towards early detection of oral cancer among medical officers in Hulu Langat district. **Methods:** A cross-sectional study was conducted among 251 medical officers. The questionnaire used was adopted and adapted from previous study. It was validated before being distributed to respondents. Descriptive analysis was performed using SPSS. **Results:** A total of 170 (67.7%) out of 251 Medical Officers participated in this study. Majority (99.4%) were aware of oral cancer, and their (67.5%) understanding of risk factors of oral cancer were satisfactory. While 74.1% of respondents reported to have knowledge on sign and symptoms of oral cancer. However, half of the respondents (52.9%) were unaware of various ways in detecting oral cancer. Additionally, almost two-third of the medical officers (62.4%) felt that they lacked competence in detecting oral cancer. More than half (60.0%) respondents reported that they did inform patients regarding oral cancer risk factors. Unfortunately, only 20.6% examine patients routinely for signs of oral cancer. Majority (93.5%) claimed to have never attended any course on oral cancer in the past 5 years. It was found that 52.9% referred suspicious lesion to dentists, while 36.5% referred to Oral Maxillofacial Specialist. **Conclusion:** Despite evident of knowledge gaps, the medical officers in Hulu Langat showed good attitude and practice towards oral cancer detection and prevention. Incorporating such training on oral potentially malignant disorders and oral cancer detection among medical officers into scheduled CPD activities in the district could effectively address these gaps.

**Keywords:** Medical officers, early detection, oral cancer

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## 101. THE HOMELESS IN SEREMBAN: AN ORAL HEALTH NEEDS ASSESSMENT

*Devadhoss PP, Saidin NI, Kamarozaman DMS*

**Introduction:** Homeless individuals face significant health inequalities and often struggle to access healthcare due to various personal and systemic barriers. Nonetheless, outreach initiatives tailored to their needs have not been fully integrated into government dental services in Malaysia. **Aim:** The aims of this study were to describe a community oral health intervention delivered to the homeless in the urban setting of Seremban and to assess the oral health needs of this population, in order to determine levels of unmet need. **Methodology:** Clinical oral health records of the homeless who attended a community and mobile dental service in Seremban were retrospectively audited. Demographic and oral health status data of the attendees were coded and analysed using SPSS. Descriptive statistics were performed. **Results:** From January to March 2023, five visits were conducted at the Dapur Kausar soup kitchen, where oral health examinations were provided to the homeless. A total of 64 individuals attended the service. The mean age was 58.8 years (SD: 13.3), with half being 60 years or older. The majority were male (76.6%), and 45.3% were of Chinese ethnicity. The mean D3vcMFT of the participants was 21.2 (SD 10.1); every participant had D3vcMFT>0. The largest component of the D3vcMFT was the missing teeth (17.3), with 51.6% having at least one missing tooth and 48.4% missing more than half their teeth. Over a quarter of the attendees were completely edentulous. A basic periodontal examination showed that 95.7% of dentate individuals had calculus in at least one sextant. **Conclusion:** This sample of homeless adults was found to have high unmet oral health needs. These findings suggest the need to continue community-based oral health interventions to facilitate access to care for this vulnerable population.

**Keywords:** Oral health, homelessness, community outreach, mobile health units, dental health services

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## 102. FAKE BRACES: A CROSS-SECTIONAL STUDY OF TIKTOK VIDEOS

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**Introduction:** Fake braces are defined as orthodontic appliances which are fixed to the teeth and fitted by unlicensed providers. Fake braces sellers promote their products through social media such as TikTok, which is an application that allows posting of videos under 3 minutes. **Objectives:** The aim of this study is to investigate the content and characteristics of TikTok videos in relation to fake braces. **Methods:** A cross-sectional study on fake braces videos uploaded on TikTok was conducted on January 2024. Public TikTok videos were collected via 4 hashtags: #fakebraces, #bracesmurah, #fashionbraces, and #realbraces. Characteristics, content, and metadata of each video were extracted by the investigators and recorded manually into Microsoft Excel and analyzed using SPSS. **Results:** From the 1,150 videos screened, 378 videos were included in the study. Fake braces videos uploaded since 2020 had 77.5M views, 6.1M likes, 59,255 comments, 355,912 saves, and 60,152 shares in total. Majority were posted by fake braces sellers (79.9%), followed by health professionals (15.6%) and laypeople (4.5%). Marketing theme had the highest number of uploads (66.9%), followed by informational (16.7%), procedural (12.4%), humor (2.4%), and testimonial (1.6%). Significant association was found between identity of uploader and theme of videos uploaded ( $p<0.001$ ) with fake braces sellers contributing most to marketing videos (251/253) while health professionals uploaded most of the informational videos (44/63). Humour-themed videos received significantly higher shares than procedural, informational, and marketing themes ( $p<0.05$ ). **Conclusion:** Fake braces videos on TikTok were uploaded by various groups of users presenting different themes that could be beneficial or misleading to the public. Oral health literacy in using social media platforms should be strengthened to prevent misconception of those searching for health information online. Efforts should be done to increase visibility of informational content provided by healthcare professionals to counteract the misinformation spread by fake braces sellers.

**Keywords:** Fake braces, social media, TikTok

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### 103. ORAL HEALTH LITERACY AMONG CAREGIVERS OF COMMUNITY-BASED REHABILITATION CENTRE (PDK) IN SEREMBAN

*Kamarozaman DMS, Kamal NS, Ponniah Devadhoss P, Hilmi IM, Muhammad Z*

**Introduction:** Special need individuals were known to experience oral health inequality due to their disabilities and medical co-morbidities. This population was highly dependent on their caregivers in conducting daily oral health practice. Studies showed that institutional caregivers had pedagogical and social training, but were not educated to deal with health issues. In Malaysia, the Community-Based Rehabilitation Centre (PDK) caregivers were provided with a very brief outline on oral hygiene practice. **Aims:** The aim of this study is to assess the levels of oral health literacy among PDK caregivers in Seremban. **Methods:** This was a cross-sectional study involving caregivers in thirteen PDKs. Data were collected through a self-administered questionnaire and structured face-to-face interview using Oral Health Literacy Malay Version (OHLI-M) with a total of 57 items. The questionnaire assessed comprehension and numerical ability of caregivers based on domains namely, accessing dental care, understanding appointment and following medication instructions. **Results:** There were 70 respondents involved in this study. Majority were female (94.3%), Malays (78.6%), married (78.6%) with secondary school education (71.4%). More than half of the respondents had an adequate level of OHL (68.6%), followed by marginal (30%) and inadequate (1.4%). In the comprehension section, there were five questions that received less than 50% correct answers. The respondents were found to score very low on questions related to medication instructions in the numeracy section. None of the sociodemographic profiles significantly associated with the level of OHL. **Conclusion:** It was found that nearly 40% of the carers had inadequate level of OHL and more than half did not understand the medication instructions. Hence, it is important to consider a dedicated training module for caregivers in PDK as the special care trainee is highly dependent on them to take care of their oral hygiene as well as to convey important information related to oral health to their parents, where necessary.

**Keywords:** Health literacy, caregivers, rehabilitation center

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## 104. EXPLORING THE BARRIERS AND ENABLERS OF SAFE ORAL SEXUAL PRACTICES AMONG TRANSGENDER WOMEN OF MALAYSIA: A QUALITATIVE STUDY ON STI TRANSMISSION

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**Background:** Transgender women (TGW) in Malaysia experience unique social and interpersonal challenges that contribute to their risk of acquiring HIV and sexually transmitted infections (STIs). (Fig 1) The study aimed to understand the experiences of this vulnerable population, barriers and enablers of safe sexual practices relating to oral transmission of STIs. **Methods:** Participants were recruited through a snow-balling method of sampling with the help of TGW community advocates. Theories of Health Belief Model and Andersen's Behaviour Model of health services use were used to devise the interview guide. Semi-structured in-depth interviews and Focus group discussion with participants gave insights into the needs of the community. (Fig 2) The data obtained was transcribed, coded and subjected to thematic analysis using the constructs of the Information, Motivation and Behavioural skills (IMB) theory. Results are presented as n (%) or median (interquartile range, unless otherwise stated). **Results:** Participant characteristics are outlined in table 1. The major themes that emerged through qualitative analysis are highlighted in Fig 3. The results identified gaps in awareness of oral transmission of STIs among TGW and lack of condom use during oral sex. Self-medication / non-professional treatments and lack of utilization of dental services was a concern. **Conclusion:** The importance of social support in positively influencing health promotion as well as improving health care and dental care utilization was highlighted. The areas of concern identified through this qualitative research will inform the design and development of an educational intervention aimed at addressing these concerns and providing support. Developing a customised, culturally sensitive, peer reviewed educational intervention that will be delivered through a widely popular social media platform is proposed

**Keywords:** Transgender women, HIV/STI, oral transmission, qualitative analysis

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## 105. KNOWLEDGE AND AWARENESS ON BIOMEDICAL WASTE MANAGEMENT AMONG CLINICAL YEAR DENTAL STUDENTS IN KLANG VALLEY

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**Background and aim:** Improper management of biomedical waste can have negative impacts on public health, the environment, and public safety. Our research aims to evaluate the level of knowledge and awareness among clinical year dental students in the Klang Valley regarding biomedical waste management. We hypothesise that these students will score 80% or higher on awareness and knowledge questions related to this topic. **Materials and methods:** The questionnaire was validated through content and response process validation and was distributed to the representatives from the eight universities in the form of a Google Form and hard copy, collecting 319 responses. Data analysis was performed using IBM's SPSS software. **Results:** The mean scores for the awareness and knowledge sections were 3.997 and 12.712, respectively. One-sample t-test rejected our hypothesis, indicating a lack of awareness and knowledge among clinical year dental students regarding biomedical waste management. **Conclusion:** The clinical year dental students have the basic knowledge on biomedical waste segregation. However, they lack the knowledge in certain key areas such as the proper colour coding of the waste bags, correct storage technique, proper waste disposal timing, documentation, and awareness of the guideline provided by the government and certified clinical waste disposal services. Therefore, it is recommended that all universities implement biomedical waste management in line with the Guideline on the Handling and Management of Clinical Wastes in Malaysia by the Department of Environment Malaysia. Additionally, it is crucial to educate students on the latest guidelines and any certified clinical waste disposal services available.

**Keywords:** Biomedical waste, waste management, disposal of waste

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## 106. LEVEL OF KNOWLEDGE AND ATTITUDES TOWARDS DEDICATED DENTAL PROMOTION TEAM (DPT) AMONG TEAM MEMBERS IN CENTRAL REGION OF MALAYSIA

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**Introduction:** In Malaysia, Dedicated Dental Promotion Team (DPT) was initiated since 2017 in Federal Territory of Kuala Lumpur & Putrajaya (FTKL & P) with the aim to improve oral health status of the targeted population through oral health promotion activities. Then, it was implemented to two other states namely, Selangor and Negeri Sembilan in 2018 and 2020 respectively. Therefore, conducting this study would provide important insights regarding DPT that will be useful for further improvement. **Objectives:** To assess level of knowledge among DPT members towards the objectives, roles, and activities of DPT and to determine their attitudes towards the importance and feasibility of DPT. **Methodology:** A cross sectional study was conducted among 120 current and former DPT members working in Selangor, FTKL & P, and Negeri Sembilan State Oral Health Division from July to September 2022. A multi-stage sampling method was employed, and a validated self-administered questionnaire was used to measure knowledge and attitudes towards DPT. Data were quantitatively analysed using Microsoft Excel Version 2018 software. **Results:** A total of 120 respondents participated in this study with 95.8% response rate. Most respondents (73.7%) had moderate overall knowledge about DPT. Knowledge towards the objectives of DPT was good (84.1%), whereas knowledge towards the roles (76.9%) and activities (61.7%) of DPT were found to be moderate. Majority (82.3%) has positive attitudes towards the importance of DPT. While attitudes towards the feasibility of DPT was found to be moderate (71.3%). **Conclusions:** The level of knowledge towards DPT among the team members is moderate. However, majority of them have positive attitudes towards the importance of DPT. Therefore, the development of guidelines for DPT need to be considered and take into account the expansion of DPT initiative nationwide.

**Keywords:** Dedicated dental promotion team; oral health promotion

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## 107. DEVELOPMENT AND VALIDATION OF QUESTIONNAIRE TO ASSESS KNOWLEDGE, ATTITUDE, STRENGTHS, AND WEAKNESSES OF DEDICATED DENTAL PROMOTION TEAM (DPT) PROGRAM AMONG MEMBERS

Masrom H, Roslan AN, Mohamad M, Alias R, Mohamad Yusof NF, Ku Haris KA, Mat Hasan@Husin R, Kamaruddin F

**Introduction:** Currently, there is no validated questionnaire available to assess knowledge, attitude, strengths and weaknesses of Dedicated Dental Promotion Team (DPT) program. **Aims:** To develop and validate a new self-administered questionnaire to assess knowledge, attitude, strengths and weaknesses of DPT program from members' point of view. **Methods:** Questionnaire was developed through several stages. In Stage I, individual qualitative interviews were conducted among seven ex-DPT members from Selangor, Negeri Sembilan and Federal Territory of Kuala Lumpur who were dental officers and dental therapist. Interviews were conducted via phone call and face-to-face meetings to gain perception regarding effectiveness of DPT program. The information was categorized into three domains forming the basis of the questionnaire. The knowledge, attitude, strengths, and weaknesses domains comprised 8, 15, and 18 items, respectively. The questionnaire, known as DPT- KAS questionnaire, was prepared in both Bahasa Malaysia and English, translated forward and backward by language teacher and language translator. In Stage II, content validity was assessed by two dental public health specialists. Minor corrections were made after content validation. Then, face validity was performed among five respondents, showing 100% agreement on clarity and relevance. The final stage involved a pilot study among 30 DPT members. Exploratory factor analysis was performed using Kaiser-Meyer-Olkin (KMO) and Bartlett's test. Questionnaire's internal consistency was tested using Cronbach's  $\alpha$  coefficient. **Results:** The KMO measure of sampling adequacy was 0.861 and 0.724 for attitude and strengths and weaknesses domain, indicated a highly acceptable score. Bartlett's test of sphericity for both domains were also highly significant ( $p < 0.001$ ). Independent Cronbach's  $\alpha$  for knowledge=0.644, attitude=0.968, and strengths and weaknesses=0.808, indicating good internal consistency. **Conclusion:** The DPT-KAS questionnaire showed good validity and reliability among dental officers and dental therapist.

**Keywords:** Dedicated dental promotion team (DPT), DPT-KAS questionnaire, validity

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## 108. THE MEMBERS' PERSPECTIVE ON STRENGTHS AND WEAKNESSES OF THE DEDICATED DENTAL PROMOTION TEAM (DPT)

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**Introduction:** Health promotion is essential in addressing the lack of knowledge and awareness about oral health care in public. In previous research, the dedicated Dental Promotion Team (DPT) has proved to be effective in ensuring the oral health promotion and prevention programme. However, the implementation of DPT across the states is not standardised and there is no proper output monitoring mechanism. **Objective:** To determine the strengths and weaknesses of the DPT programme from the DPT members' point of view. **Methods:** A cross-sectional study was conducted among 120 current and former DPT members working in Selangor, FTKL & P, and Negeri Sembilan State Oral Health Division from July to September 2022. A multi-stage sampling method was employed and a validated self-administered questionnaire was used to assess the strengths and weaknesses of DPT. Data were descriptively analysed using Microsoft Excel Version 2018 software. **Results:** Majority of the respondents acknowledged that DPT formation will enhance the coverage of OHP activities and delivery (82.3%). Additionally, 74.4% admitted that DPT formation will provide more focus in handling OHP activities. With regards to the implementation of DPT, number of members had issues with insufficient team members (63.9%), using own vehicle to carry out DPT visits (51.7%), finding replacements for those who were unable to be on duty (76.3%), getting official transport (61.4%), potential of decrease in clinical skills (40.9%), and interruption in the smoothness of dental services in school/preschool/nursery (28.8%). **Conclusion:** DPT has its strengths in enhancing oral health promotion activities and the skills of DPT members in delivering oral health messages. However, attention should be given to tackling issues regarding manpower allocation, training, and transportation.

**Keywords:** Dedicated Dental Promotion Team, oral health promotion

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## 109. SELANGOR DENTAL HEALTHCARE UTILIZATION DURING MOVEMENT CONTROL ORDER (COVID-19)

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**Introduction:** The COVID-19 pandemic led to significant disruptions in various aspects of healthcare, including dental services, particularly due to the high-risk nature of dental clinics for viral transmission. **Objective:** Aim of this study conducted to investigate how dental visits and oral health were impacted by the COVID-19 pandemic in Selangor, Malaysia. **Methods:** A cross-sectional study design was employed, with data collected from 474 participants aged 18 and above using both an online survey via Google Forms and distributed hard copies. The participants were individuals who experienced challenges in visiting dental clinics and faced oral health problems during the pandemic. The data were analysed using the SPSS statistical software. **Results:** The results revealed that 63.3% of respondents managed to receive dental treatment during the pandemic, while 36.7% did not. Among those who received treatment, 75.4% encountered difficulties, such as restrictions on movement or clinic availability, while 24.6% did not report any challenges. For those unable to receive dental care, the most common consequences included deterioration in oral health (30.8%), prolonged pain (17.8%), missed professional consultations (24.9%), and other issues such as bad breath, damaged dental appliances, and delayed treatment. **Conclusions:** These findings highlight the adverse effects of the pandemic on dental care accessibility and the resulting negative impacts on oral health. The study concludes that the COVID-19 pandemic significantly hindered both access to dental services and the overall oral health of the population in Selangor. The results suggest a need for stronger contingency planning to ensure dental care is not disrupted during future pandemics or similar crises, ensuring that public oral health remains safeguarded even in times of global health emergencies.

**Keywords:** Oral healthcare, COVID-19, challenges in visiting dental clinics

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## 110. ASSESSMENT OF ORAL HEALTH KNOWLEDGE OF YOUNG ADULTS IN SUBANG JAYA

*Lee X, Tan FW, You J, Vengadasalam S, Kanagarajah AR*

**Introduction:** Good oral health is a crucial indicator of overall well-being, reflecting the absence of disease and the ability to perform essential functions like eating and speaking. **Objective:** This cross-sectional study aimed to assess oral health knowledge and behaviors among young adults aged 18-30 in Subang Jaya, Selangor, Malaysia. **Methods:** A sample of 384 individuals was selected using convenience sampling and data was collected through a validated questionnaire measuring demographics, oral health knowledge, and hygiene practices. **Results:** The results revealed significant associations between gender and oral hygiene behaviors. Females demonstrated better flossing habits, more frequent brushing, and greater knowledge of fluoride than males. Furthermore, education level was a significant predictor of oral health behaviors, with individuals holding higher education levels exhibiting increased adherence to recommended oral hygiene practices. However, no significant association was found between gender or education level and the frequency of dental checkups. **Conclusions:** These findings highlight the need for focused public health interventions to improve oral health literacy, particularly among men and individuals with lower educational attainment. Targeted efforts could reduce gender and education related disparities, ultimately enhancing oral health outcomes and contributing to overall health equity.

**Keywords:** Oral health, gender differences, education level, flossing, brushing frequency, fluoride knowledge, public health interventions, Subang Jaya.

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## 111. BRIDGING GAPS: KNOWLEDGE AND PRACTICE OF ROOT SUPPORTED OVERDENTURES AMONG NEGERI SEMBILAN'S GOVERNMENT DENTISTS

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**Background:** Root-supported overdentures play a pivotal role in prosthodontic care for partially edentulous patients, aiding in bone preservation and stalling the progression to complete edentulism. **Objectives:** This study were to determine the knowledge and practice of root-supported overdentures among dental officers working in the government sector in Negeri Sembilan and to analyze the association between knowledge and practice in delivering root-supported overdentures in Negeri Sembilan government dental clinics. **Methodology:** The study involved 150 participants, with 100% response rate. A self-administered online questionnaire was employed using a simple random sampling method. The results showed that about half of the respondents had more than 6 years of working experience, and most were practiced in non-hospital-based settings. However, most dental officers (90.7%) had inadequate knowledge about root-supported overdentures, and actual practice was minimal, with 98% of dentists reporting no practice. **Results:** About half of respondents (46%) have more than 6 years working experience. Most of the respondent were practiced in non-hospital-based setting (96%). A majority (90.7%) of dental officers have inadequate knowledge about root-supported overdenture. In tandem with the knowledge gap, the actual practice of root-supported overdentures was minimal, with 98% of dentists reporting no practice. Statistical analysis highlighted a significant difference in knowledge adequacy between dentists in hospitals and those in non-hospital base (P value=0.001). There was no significant difference between years of work experience with knowledge adequacy and practice of overdenture regardless the location of practice. **Conclusions:** The findings highlight poor knowledge and practices of overdenture among dental officers in Negeri Sembilan, regardless of location or working experience. Enhancing expertise in this area could lead to better retention and improve the function of removable partial denture, hence enhancing patients' quality of life. It is important to re-establish the practice of root-supported overdentures throughout the government oral health service.

**Keywords:** Bone preservation, edentulism, removable partial denture, root supported overdenture, partially edentulous

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## 112. EXPLORING INFORMAL CAREGIVERS' PERSPECTIVES ON ORAL CARE FOR STROKE PATIENTS

*Rani H, Muhammad Zamzuri SN, Omar E, Mohd-Dom TN, Abdul Aziz AF, Ali MF*

**Introduction:** Stroke often results in physical disability and functional impairment, which may severely limit patients' ability to care for personal hygiene, including oral care. **Objective:** This study aimed to identify the challenges faced by informal caregivers in managing the oral health of stroke patients. **Methods:** This study conducted semi-structured individual interviews with eight home-based caregivers of stroke patients recruited from a community-based clinic facility of a public university in Malaysia. The interviews took 30-45 minutes to complete and were transcribed verbatim. Transcripts were analyzed thematically using a phenomenological approach. **Results:** Relevant themes that emerged were variations in oral hygiene care, caregivers' concerns in providing oral care, dental clinic utilization, and caregivers' perceived educational and training needs. **Conclusion:** This study highlights the challenges faced by caregivers in managing the oral health of stroke patients. Improving access to dental services for stroke patients and tailoring educational programs to suit the specific learning needs of caregivers, as identified in this study, may result in improved health outcomes for stroke patients.

**Keywords:** Caregivers, oral care, oral hygiene, stroke care, stroke rehabilitation

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### 113. INVESTIGATING THE CHALLENGES AND OPPORTUNITIES OF DOMICILIARY ORAL CARE FOR THE OLDER ADULTS: A SCOPING REVIEW

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**Background/Objectives:** Older adults need specialised dental care due to age-related changes and chronic conditions, but inadequate coordination and capacity hinder access to domiciliary oral care. This review explores the characteristics, barriers, facilitators, caregiver education, and outcomes of domiciliary oral care to improve services for frail older adults. **Methods:** A systematic scoping search was conducted following the PRISMA guidelines. A literature search was performed to identify the key search terms and the databases that were relevant to the objectives. A total of 454 documents were retrieved, 31 of which were included in the final synthesis. **Results:** Overall, the barriers and facilitators in delivering domiciliary dental service for the elderly can be categorised into four groups: system, oral healthcare provider, caregiver, and patient. Having policies or guidelines supporting domiciliary oral care was one of the most frequently reported factors. Six studies reported outcomes of educational programme for caregivers and all were with positive results. **Conclusions:** The review highlights the need for a multi-pronged approach involving the healthcare system, oral healthcare providers, caregivers, and older adults themselves to improve access to and quality of oral healthcare services for this vulnerable population.

**Keywords:** Domiciliary care, elderly, oral health, caregiver

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## 114. TO ASSESS THE KNOWLEDGE, AWARENESS, AND PERCEPTION OF NON-DENTISTS OFFERING ORTHODONTIC TREATMENT AMONG THE MALAYSIAN YOUNG ADULT POPULATION

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**Background:** The increasing number of young adults seeking cheaper and easily accessible orthodontic treatment from unlicensed practitioners in Malaysia poses significant risks to patients. Therefore, it is essential to evaluate their motivations and awareness regarding such practices. The objective of our study was to assess the knowledge, awareness, and perceptions of non-dentists offering orthodontic treatment among the Malaysian young adult population. **Methods:** This was a cross-sectional study. An online self-administered questionnaire was distributed to Malaysian citizens aged 18–37 years. The questionnaire consisted of 11 questions that investigated their awareness of non-dentists offering orthodontic treatment, the harmful effects of braces fitted by non-dentists, and potential strategies to mitigate this phenomenon. **Results:** The study was completed by 426 participants, predominantly Malay, with a mean age of 22.9 years. A total of 76.1% reported awareness of braces fixed by non-dentists, primarily through social media platforms such as Instagram and Facebook. Lower cost emerged as the predominant motive (83.6%) for opting for non-dentist orthodontic treatment, followed by no waiting list (48.8%). Notably, the majority of participants acknowledged the illegality (70%) and potential harm (77%) associated with non-dentists providing orthodontic treatment. Legal enforcement (53.1%) was identified as the preferred method for mitigating this practice. Occupation significantly influenced knowledge of illegal orthodontic treatment ( $p < 0.05$ ), however no significant association was found for gender and level of education ( $p > 0.05$ ). **Conclusion:** The survey revealed that young adults are aware of and informed about non-dentists offering orthodontic treatment. While they identified cost as the primary reason for seeking such services, they also recognized legislation and public awareness through campaigns and social media as effective strategies to address this issue. Additionally, significant differences in legal awareness were observed among different occupational levels.

**Keywords:** Non-dentist, young adults, knowledge, influence, perception

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## 115. INSIGHTS INTO THE ORAL HEALTHCARE WORKFORCE: BASELINE PROFILING OF REGISTERED DENTAL SPECIALISTS IN MALAYSIA, 2022-2023

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**Introduction:** The provision of specialized dental services plays a crucial role in enhancing the overall quality of oral healthcare and contributing to the effectiveness of healthcare systems. In Malaysia, recent regulatory changes have underscored the importance of understanding the demographic, professional, and practice characteristics of registered dental specialists to support strategic planning and policy development. However, a comprehensive analysis of these specialists has been lacking, hindering efforts to optimize specialized dental care and address workforce requirements effectively.

**Objective:** To comprehensively examine the demographic, professional and practice characteristics of registered dental specialists in Malaysia. **Methods:** Utilizing data from the Malaysian Dental Council's specialist register for the years 2022 to 2023, a quantitative methodology was employed to analyse various factors such as gender distribution, ethnic representation, age distribution, specialty distribution, post-graduate training, years of experience and practice settings. **Results:** The results indicate that as at 31 December 2023, there are 961 registered dental specialists in Malaysia, with a majority being female (70%) and of Malay ethnicity (64.9%). Orthodontics is the most popular specialty, followed by oral and maxillofacial surgery and periodontics. The study also reveals disparities across various demographic and professional categories. Notably, the majority of specialists earned their post-graduate qualifications abroad. **Conclusion:** This study provides valuable insights into the profile of registered dental specialists in Malaysia, offering a foundation for evidence-based decision-making, strategic planning, and policy formulation in the healthcare sector. By addressing knowledge gaps and supporting workforce adequacy, it contributes to the improvement of specialized dental care in the country.

**Keywords:** Dental specialists, workforce analysis, healthcare policy

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## 116. EVALUATING PATIENT SATISFACTION TOWARDS ORTHODONTIC TREATMENT AT PEKAN ORTHODONTIC CLINIC

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**Aim and objective** To evaluate patient satisfaction with orthodontic treatment in a rural orthodontic clinic and to determine the factor that contributes the most to patient satisfaction. The secondary objective is to assess the relationship between patient gender with the level of satisfaction. **Materials and methods:** This cross-sectional study was conducted on patients who received orthodontic treatment in a public orthodontic clinic situated in Pekan, Pahang Malaysia. A validated questionnaire (six-point Likert scale) was used to assess patient satisfaction with orthodontic treatment. **Results:** A total of 80 patients completed the survey (response rate = 100%). More females (69.5%) than males (30.5%) participated in the study. The participants gave the highest satisfaction score to dentofacial improvement (mean score  $5.57 \pm 0.54$ ). This was followed by dental functions (mean score  $5.56 \pm 0.61$ ), doctor-patient relationship (mean score  $5.43 \pm 0.48$ ), psychosocial improvement (mean score  $5.31 \pm 0.39$ ), residual category (mean score  $5.31 \pm 0.38$ ), and finally by situational aspects (mean score  $5.29 \pm 0.57$ ). However, there was no single category that significantly contributed to patient satisfaction levels. The participants also showed no significant relationship between gender and the satisfaction level. **Conclusion:** Overall, a high level of patient satisfaction was observed in the present study which showed that orthodontic treatment is widely accepted as part of healthcare services in the province.

**Keywords:** Orthodontic, satisfaction, rural

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## 117. EXPLORING THE UTILIZATION, COVERAGE AND ACCESSIBILITY OF DENTAL CARE AMONG RURAL VILLAGES SERVED BY FLYING DENTAL SQUAD IN SABAH, MALAYSIA

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**Objectives:** To assess the utilization, coverage and accessibility of dental care among rural villages covered by the Flying Dental Squad (FDS). **Methods:** Retrospective study using secondary data retrieved from the Annual Dental Report from Oral Health Division of Kota Kinabalu district and Penampang district. The number of populations of villages covered by FDS will be traced from Sabah's Headquarter for Vector-Borne Disease Control Program. Dental records of patients registered by the Flying Dental Squad of Penampang and Kota Kinabalu team will be traced from June 2023 until August 2024 and collected from work return PG207. The displacement from the said 11 villages to the nearest Ministry of Health dental clinic will be assessed and calculated using Google Maps. **Results:** From June 2023 to August 2024, FDS provided oral health services to 11 villages across 5 districts. A total of 251 villagers received care, including 145 children under 18 and 101 adults. The average dft and DMFT cores for children were 4.3 and 0.99, respectively, while the average DMFT for adults was 10.92. Percentages of covered villagers per population of respective villages ranged from 1.82% to 55.22%. The displacement of the villages to the nearest Ministry of Health dental clinic ranged from 24.34km to 84.6km. FDS provided 85 fluoride applications, 23 fillings, and 145 extractions. **Conclusions:** The utilization and coverage of dental care among rural villages by FDS is low and accessibility of villagers to get to the nearest dental clinic remains a big challenge.

**Keywords:** Flying dental squad, rural, oral health, accessibility, coverage, utilization

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## 118. EXPLORING DENTAL CARE FOR ANTENATAL PATIENT IN KUDAT DISTRICT, SABAH, MALAYSIA

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**Aim:** This study aims to determine the coverage of dental care and its relationship with the number of dental officers among antenatal patients in Kudat district, Sabah, Malaysia. **Method:** A cross-sectional study was conducted to explore the relationship between dental care coverage and the number of dental officers among antenatal patients registered at Kudat Maternal and Child Health (MCH) Clinics and the Kudat Government Dental Clinic from 2019 to 2023. The study utilized secondary data from dental and health records, along with reports from the Oral Health Division and MCH Clinics. The Annual Staffing Report was analyzed to examine the relationship between the number of dental officers and the frequency of dental visits. **Results:** The study found a significant positive correlation between the frequency of dentist visits and the percentage of coverage (Correlation Coefficient = 0.203, p-value = 0.004). Higher coverage was associated with increased frequency of visits. Additionally, there was a strong positive correlation between the number of dental officers and coverage percentage (Correlation Coefficient = 0.294, p-value < 0.001) suggesting that better staffing levels improve coverage. However, no significant relationship was found between the number of dental officers and the frequency of visits (Correlation Coefficient = -0.013, p-value = 0.854). **Conclusion:** The findings emphasize the importance of increasing the frequency of dental visits and enhancing staffing levels to improve dental care coverage among antenatal patients in Kudat district.

**Keywords:** Dental care for antenatal patient

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## 119. AN ASSESSMENT OF KNOWLEDGE ON HAEMOPHILIA AND THE DENTAL MANAGEMENT AMONG GOVERNMENT PAEDIATRIC DENTAL HEALTH CARE PROVIDERS IN MALAYSIA

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**Introduction:** Routine dental procedures can cause bleeding, especially in patients with hereditary bleeding disorders such as haemophilia. These patients may require hospital care due to uncontrollable bleeding. To improve outcomes, the Malaysian Ministry of Health created the “Management of Haemophilia” clinical practice guideline (CPG) in 2018. However, healthcare providers (HCPs) must tailor management to individual cases and available treatment. Hence, dental providers need to understand bleeding disorders to ensure safe practices. **Objectives:** This paper aims to assess the knowledge level of paediatric dental HCPs on haemophilia and its dental management. Participants include paediatric dental specialists, dental officers, and dental therapists who attended an online course on ‘Standardization of haemophilia patient management in Paediatric Dentistry’, organized by the National Paediatric Dental Haemophilia Committee (Malaysia) on June 14-15, 2022. **Methods:** This cross-sectional study utilizes a questionnaire developed based on the Haemophilia CPG to assess knowledge levels of haemophilia, with a total questionnaire score of 35. Participants completed the questionnaire three times: before the course (SAQ1), immediately after (SAQ2), and one year later (SAQ3). **Results:** Sixty-five participants, including 24 Specialists, 26 Dental Officers, and 15 dental therapists, completed all three rounds of the questionnaire. Mean scores were 19.3 for SAQ1, 26.9 for SAQ2, and 24.5 for SAQ3. Analysis using a paired t-test showed a significant increase between SAQ1 and SAQ2 (7.6,  $p<.001$ ), and between SAQ1 and SAQ3 (5.2,  $p<.001$ ). A significant decrease in scores was observed between SAQ2 and SAQ3 (-2.4,  $p<.001$ ). **Conclusion:** The course effectively improves haemophilia knowledge among paediatric dental healthcare providers, evidenced by a significant increase in scores from pre-course to post-course. Despite a decline in scores one year later, there is still a significant improvement compared to pre-course levels. Therefore, while the course is beneficial, regular refresher courses are recommended to maintain knowledge retention over time.

**Keywords:** Haemophilia, knowledge level, paediatric dental

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## 120. ASSOCIATION BETWEEN AGE AND ORAL HEALTH-RELATED QUALITY OF LIFE (OHRQOL) IN THE ELDERLY AND PRE-ELDERLY IN DUNGUN: A STUDY OF GENERAL HEALTH AND ORAL HEALTH STATUS

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**Introduction:** Elderly is perceptively burdened with comorbidities, polypharmacy, and cognitive deterioration, that gives an impact on their capacity to maintain oral hygiene (Chen et al., 2010). Dentistry aims to improve the overall oral health-related quality of life of the elderly. However, as the population ages, it's important to understand the health and oral health of both the elderly and pre-elderly. This study aims to assess the current general and oral health status of the elderly and pre-elderly in Dungun. Also, to investigate the correlation of age category with oral-health related quality of life (OHRQoL). **Method:** This was a prospective cross-sectional study that randomly sampled pre-elderly (aged  $\geq 50$  to 60 years old) and elderly (aged  $\geq 60$  years) who attended the government dental clinics in Dungun, from October 2021 to January 2023. After exclusion, there were 137 subjects in the elderly group and 102 subjects in the pre-elderly group, which were interviewed using validated OHRQoL questionnaires (Fang et.al.,2018). The frequency and correlation of the data were analysed using SPSS version 27. Correlation analysis for the age group and OHRQoL questionnaires was using Kendall Tau-B correlation. **Result:** High percentage of the elderly (77.4%) and pre-elderly (66.7%) had medical problems, including hypertension, hyperlipidaemia, diabetes mellitus, and others. Despite having fair oral hygiene, elderly and pre-elderly populations had high caries risk status (47.4%, 52.6%). Yet, half of the elderly population had dentures, compared to only 29.9% of the pre-elderly. Mean total OHRQoL score for both groups were 35.97 (6.384). The elderly reported more dissatisfaction orally than the pre-elderly. There was a very weak but significant correlation between OHRQoL and the population's category,  $R=0.194$  ( $\text{sig}=0.001$ ). **Conclusion:** Elderly and pre-elderly people had comparable medical and oral health problems; however, elderly people were less satisfied with their oral health-related quality of life.

**Keywords:** Elderly, Oral Health-Related Quality of Life (OHRQoL), general health, oral health status, Geriatric Oral Health Assessment Index (GOHAI)

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## 121. IMMEDIATE DENTAL TREATMENT AMONG OUTPATIENTS AT CHEMOR AND JELAPANG GOVERNMENT PRIMARY DENTAL CLINICS: BASELINE DATA

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**Introductions:** Immediate dental treatment is dental care provided on the same day and greatly affects the satisfaction of dental services among patients. There is no record of the percentage of patients receiving immediate dental treatment in public dental clinics. Thus, there is less evidence for authorities to improve dental service delivery and enhance patient satisfaction. **Objective:** This study aims to gather information regarding the proportion of outpatients receiving immediate dental treatment at Chemor and Jelapang Dental Clinic in September 2022. **Methods:** Data from outpatients who visited the Chemor and Jelapang Dental Clinic in September 2022 are used in this cross-sectional study. The information was gathered from the dental treatment cards LP8-1 Pin 8/2019 and the patient's registration form PG 101 (Pin.3/04). Data were analyzed using an Excel data worksheet. **Results:** 1444 outpatients were involved in this study. About 85% of outpatients received immediate dental treatment, and 15% were given appointments for their treatment. There are 14 types of dental treatment listed as immediate dental treatment received by patients. Both dental clinics included in this study showed a similar pattern of patients who received immediate dental treatment; and dental extraction was the highest type of treatment given (39%). Pulp extirpation (0.1%) recorded the lowest number of immediate dental treatments received by outpatients. The percentage of outpatients received immediate dental treatment at the Chemor dental clinic was 86% while at the Jelapang dental clinic was 84%. **Conclusions:** A high proportion of outpatients received immediate dental treatment, and the highest treatment was dental extraction. Similar pattern of immediate dental treatment in both dental clinics may indicate that most patients from other dental clinics in the Kinta district also received immediate dental treatment. However, further research should be carried out to rectify the implementation of immediate dental treatment in government primary dental clinics.

**Keywords:** Clinic, dental, outpatient, immediate, treatment

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## 122. RETROSPECTIVE DATA ANALYSIS OF REFERRAL LETTERS FOR OROFACIAL VASCULAR ANOMALIES TO A TERTIARY CENTER

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**Background:** Vascular anomalies are disorders of the vascular system. These anomalies are classified as either vascular tumors or vascular malformations, with each possessing distinct characteristics. This study was performed to analyze vascular anomaly referrals to a tertiary center, identify patterns of misdiagnosis, and create a proforma to ensure the comprehensiveness of clinical information. **Methods:** We retrospectively analyzed vascular anomaly referral letters received by Hospital Tunku Azizah from 2018 to 2023. Specifically, we descriptively analyzed the inclusion of vascular anomaly characteristics, the demographic profiles of referrers and patients, and basic clinical findings. Subsequently, we developed a redesigned proforma. **Results:** Overall, 47 referral letters were analyzed. The patients comprised 25 boys and 22 girls, with ages ranging from birth to 14 years. Patient name, sex, and date of birth, along with the referrer's name and address, were satisfactorily documented. The review revealed that 44 (93.6%) of the letters included the patient's presenting problem, 43 (91.5%) contained clinical findings, 37 (78.7%) reported diagnostic investigations, and 29 (61%) referenced medical history. Regarding characteristics of vascular conditions, over half of the letters detailed time of appearance (n= 40, 85%), growth (n= 24, 66%), complications (n= 25, 53.2%), color (n= 32, 68%), and shape (n= 34, 72%). However, fewer than half mentioned compressibility (n= 7, 14.8%), pulsation (n= 7, 14.7%), and associated conditions (n= 2, 4.3%), and none referenced involution. **Conclusion:** Although demographic data were generally well-documented, critical medical history information was frequently omitted, including a lack of adequate pre-referral investigations. Key characteristics of vascular anomalies, namely compressibility, pulsation, associated conditions, and involution, were frequently overlooked. Accurate documentation of these features is crucial for determining treatment urgency. A standardized proforma must be implemented to ensure that vital information is captured, thus facilitating diagnosis and optimizing patient care.

**Keywords:** Referral and consultation, vascular malformations, vascular neoplasms

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### 123. AN ASSESSMENT OF EMPATHY LEVEL AMONG GOVERNMENT DENTAL OFFICERS TOWARDS PATIENT IN TERENGGANU

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**Background:** People's thoughts, feelings, and experiences can help health practitioners in determining what their true needs are and respond appropriately. Therefore, acquiring empathy skills is crucial for health workers to do this. The Interpersonal Reactivity Index (IRI) is a tool used by the medical community and other health professionals to assess empathy. **Objective:** To assess an empathy level among government dental officers towards patients in Terengganu setting. **Material and methodology:** Using IRI, 274 government dental personnel in Terengganu participated in a cross-sectional questionnaire survey. Following ethical approval from MREC and participant consent, a 7-minute online questionnaire has been issued by Google Forms to government dental practitioners in Terengganu over the course of seven months of data collection. To guarantee equal distribution in both arms for comparison, stratified random sampling has been employed based on gender, district, working region, and dental setting. **Statistical Analysis:** SPSS 27 was used to assess the data. The p-value was set at 5%. **Results:** The expected outcomes are high empathy levels among government dental officers toward patients in Terengganu and demographic characteristic has insignificance towards empathy level among dental officers in Terengganu towards patients. **Conclusion:** In conclusion, the findings validate the anticipated consequences of a high degree of empathy exhibited by government dental officers towards patients in Terengganu and an insignificant impact of the dental officers' empathy toward patients based on their demographic experience.

**Keywords:** Empathy, dental officers, Interpersonal Reactivity Index, patients, Terengganu

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## 124. PRELIMINARY STUDY: NONCOMPLIANCE OF ATTENDANCE FOR TWO VISITS DEEP CARIES MANAGEMENT IN GOVERNMENT DENTAL CLINIC, BESUT

Jusoh MS, Wan Sulaiman WNF, Hairuddin E, Hasnan NA, Ahmad Satmi AS, Zubir B, Arumugam NS, Zainuddin NN, Meor Amir Hamzah AM

**Introduction:** The patient's compliance with the scheduled appointments for deep caries management is crucial to ensuring the success of treatment and the longevity of the tooth. However, little is known about the prevalence and factors contributing to patients' compliance with deep caries management. **Objective:** This study aimed to determine the prevalence and factors associated with noncompliance with attendance in deep caries management at the Ministry of Health (MOH) Dental Clinic Besut from 2019 to 2020. **Methods:** This is a cross-sectional, quantitative retrospective study involving all seven MOH dental clinics in Besut from 2019 to 2020. Data and verbal consents were obtained via phone calls and treatment cards (*Laporan Perubatan 8–2 pindaan 8/2019*) and analyzed using IBM SPSS software version 23. **Results:** Of 341 patients who received deep caries management during the study period, only 240 (70.4%) patients fulfilled the inclusion criteria and data were included in this study. The study population consisted of only Malays, predominantly females (65.8%), with a mean age of 35.52 (SD  $\pm$  13.9) and working in the government sector (31.3%). There was a high prevalence of non-compliance in this study (68.3%). Five associated factors were identified: (i) clinic ( $p = 0.079$ ), (ii) occupation ( $p = 0.350$ ), (iii) education ( $p = 0.398$ ), (iv) gender ( $p = 0.777$ ), and (v) age ( $p = 0.833$ ). However, none of these were statistically significant. **Conclusion:** Non-compliance with deep caries management appointments was high in MOH dental clinics in Besut during the study period, which was presumably contributed by the Movement Control Order during the pandemic phase as well as the population's attitude towards routine dental visits. Education level is also one of the contributing factors, even though statistically it is not significant. Thus, future research with a larger sample size and in the post-pandemic era is recommended to identify possible contributing factors to non-compliance with deep caries management.

**Keywords:** Noncompliance, attendance, appointments, deep caries management

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## 125. ASSESSMENT OF KNOWLEDGE ON ROOT CANAL DISINFECTION AMONG NEW DENTAL OFFICERS IN TERENGGANU

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**Introduction:** Previous surveys have been conducted in general dental practitioners and endodontists. However, there is still lack of evidence for knowledge on root canal disinfection among new dental officers (NDOS) within 3 years of working experience. The aim of this study was to assess the knowledge on root canal disinfection among NDOS in Terengganu. A modified version of validated questionnaire was used to assess the aforementioned aim. **Materials and methods:** This were a web-based study using modified version of questionnaire developed by Dutner et al. 2012. The questionnaire consists of 12 questions related to the root canal disinfection such as irrigant selection, irrigant concentration, smear layer removal, and the used of adjuncts for the irrigation was given to 213 NDOs in Terengganu. **Results:** A web-based survey was completed only by 155 participants which was 73.8%. Majority of the participants (29.1%) were NDOs with 2 years of work experience, followed by those with three years of work experience (23.0%). Most of the participants (71.6%) had completed 1 to 5 of root canal treatment cases. From our findings, 76.8% of the participants used sodium hypochlorite (NaOCl) as root canal irrigant and 27.1% of them used concentration of NaOCl range within 0.5% -1.5%. Most of the participants (54.5%) removed smear layer while 20.6% of them used adjunct in their practice. **Conclusions:** Most of the participants used concentration of NaOCl (0.5-1.5%) and routinely remove the smear layer during endodontic treatment. In addition, a fifth of participants used an adjunct to aid in their irrigation technique.

**Keywords:** New dental officers, root canal treatment, root canal irrigants, smear layer, adjunct

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## 126. EFFECT OF DENTAL PRACTICALITY INDEX TRAINING USING AN ONLINE VIDEO ON DECISION-MAKING AND CONFIDENCE LEVEL IN TREATMENT PLANNING BY DENTAL UNDERGRADUATES

See ZW, Lee MS, Parolia A, Kanagasingam S, Gunjal S, Patel S

**Objectives:** The purpose of this study was to evaluate the effect of Dental Practicality Index (DPI) training using an online video on the treatment planning decisions and confidence level of dental undergraduates (DUs). **Materials and methods:** Ninety-four DUs were shown 15 clinical case scenarios and asked to decide on treatment plans based on 4 treatment options. The most appropriate treatment plan had been decided by a consensus panel of experienced dentists. DUs then underwent DPI training using an online video. In a post-DPI-training test, DUs were shown the same clinical case scenarios and asked to assign the best treatment option. After 6 weeks, DUs were retested to assess their knowledge retention. In all 3 tests, DUs completed the confidence level scale questionnaire. Data were analyzed using the related-samples Wilcoxon signed rank test and the independent-samples Mann-Whitney U test with the level of significance set at  $p < 0.05$ . **Results:** DPI training significantly improved the mean scores of the DUs from 7.53 in the pre-DPI-training test to 9.01 in the post-DPI-training test ( $p < 0.001$ ). After 6 weeks, the mean scores decreased marginally to 8.87 in the retention test ( $p = 0.563$ ). DPI training increased their confidence level from 5.68 pre-DPI training to 7.09 post-DPI training. **Conclusions:** Training DUs using DPI with an online video improved their decision-making and confidence level in treatment planning.

**Keywords:** Confidence, decision making, dental practicality, diagnosis, treatment planning

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## 127. OCCLUSAL DEVICE THERAPY FOR SLEEP BRUXISM: ANALYSIS OF EDUCATIONAL VALUE, CLARITY, RELIABILITY, UNDERSTANDABILITY, AND ACTIONABILITY OF INFORMATION OF CONTENT ON YOUTUBE

Thong TX, Wai JM, Nimbalkar S, Patil PG

**Statement of problem:** Sleep bruxism, characterized by teeth grinding during sleep, is often managed with an occlusal device. Despite the abundance of YouTube videos discussing occlusal device therapy, their educational quality remains unclear. **Purpose:** The purpose of this process-based audit was to assess the educational value (EV), clarity (COI), reliability (ROI), understandability (UOI), and actionability (AOI) of information regarding occlusal device therapy for sleep bruxism in YouTube videos provided by dental professionals. **Material and methods:** YouTube was searched systematically using 4 search terms. A total of 19 videos were identified using predetermined criteria. EV was assessed using a 4-point scoring system across 10 predetermined domains. A 3-point scoring system was applied to evaluate COI. Journal of American Medical Association (JAMA) Benchmark Criteria was applied to evaluate ROI. Patient Education Materials Assessment Tool for audio-visual material (PEMAT-A/V) was used to determine UOI and AOI. Descriptive statistics, interrater and intrarater reliability tests were conducted using a statistical software program. **Results:** Most videos had been uploaded by general dental practitioners (95%) followed by orthodontists (5%). The mean number of reported domains was  $4.68 \pm 2.73$  (out of 10), with the highest scoring domain being "Indications of occlusal device" ( $1.24 \pm 0.87$ ), and the lowest being "Cost of occlusal device" ( $0.00 \pm 0.00$ ). Overall, the EV score per video was  $5.61 \pm 5.10$  (out of 30), while the COI score was  $0.55 \pm 0.50$  (out of 2). The ROI averaged  $1.95 \pm 0.40$  (out of 4), with "Attribution" scoring lowest ( $0.026 \pm 0.11$ ) and "Currency" highest (1). Overall, the videos had a mean understandability of 66.6% and actionability of 45.6%. **Conclusions:** Videos uploaded by dental professionals lack sufficient educational value pertaining to the cost of occlusal devices. The videos demonstrated low reliability regarding the credibility of sources and poor understandability and actionability.

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## 128. ACCEPTABILITY OF INTERACTIVE POST-ENDODONTIC RESTORATION DECISION MAKING APPLICATION AMONG UNDERGRADUATE DENTAL STUDENTS

*Soo JQ, Wong XY, Chhabra N, Seow LL, Bhatia S*

**Background/Purpose:** Selecting an appropriate coronal restoration after root canal treatment requires careful consideration, however, there is a lack of established web-based tool that is based on clear guidelines for suitable post-endodontic restorations. Hence, we aimed to design and determine the acceptability of an interactive application to aid the decision making process for post-endodontic restoration among the undergraduate dental students. **Materials and methods:** A web-based post-endodontic restoration decision making interactive application, (RestoSmart) was developed after a detailed review of available literature. Seventy undergraduate dental students of IMU University were recruited in the study. A validated questionnaire was given to the participants before and after the use of RestoSmart to answer the provided mock clinical scenarios. Obtained data were statistically analyzed using IBM SPSS version 26 software package. **Results:** The statistical analysis demonstrated that RestoSmart was acceptable among the undergraduate dental students ( $P < 0.05$ ). Initially, participants recognized the potential benefits of designing an interactive application, 74% believing that it may enhance decision making and 76% emphasizing its user-friendliness. Additionally, close to half of the participants expressed the willingness to use interactive tools in future. Following the use of RestoSmart, there was a notable increase in favorability, with 94.2% finding it helpful in the decision making and 94.3% acknowledging its user-friendliness. Furthermore, 87.2% expressed intent to use RestoSmart in future. **Conclusion:** RestoSmart was useful for decision making and user friendly. While overall response was positive, there exist some areas for improvement such as ease of use, updating evidence-based guidelines, and establishing its helpfulness in teaching and learning.

**Keywords:** Decision making, interactive tool, post-endodontic restoration, undergraduate dental students

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## 129. CLINICAL AUDIT ON QUALITY OF RECORD KEEPING OF DENTAL IMPLANT TREATMENT PERFORMED BY DENTAL PROFESSIONALS

*Chaubal TV, Yi HJ, Shin YY, Rong JT, Seow LL, Bapat R, Parolia A*

**Aims:** To evaluate the quality of clinical record keeping for patients who underwent dental implants placement at International Medical University (IMU) Oral Health Centre (OHC). **Materials and methods:** Quality of record keeping of all dental implants placed in the IMU OHC by dental faculty, dental officers, and postgraduate diploma students between January 2015 to December 2019 was evaluated retrospectively using the electronic records. Interexaminer reliability was evaluated using Fleiss kappa test ( $\kappa \geq 80\%$ ). Each parameter was scored if it was recorded or not recorded. Frequency distributions and percentages of each parameter were calculated and tabulated. **Results:** The retrospective dental records revealed high accuracy of record keeping in age (99.6%), gender (100%), cone-beam computerised tomography (CBCT) (97.8%), written consent (95.1%), dental implant placement site (94%), implant diameter (93.6%), and implant length (93.4%). Low accuracy of record keeping is shown in smoking (15%), periodontal disease (17.4%), preoperative antibiotics (7.9%), preoperative analgesics (1.9%), preoperative chlorhexidine mouth rinse (7.3%), time of placement (11.4%), countersink drill for dense bone (0.9%), intraoperative radiograph with guide pin to check angulation (19.7%), hydration of bone graft particles (3.6%), ice pack (0%), postoperative chlorhexidine (17.2%), loading protocol (1.8%), disinfection of abutment and restoration (3.9%), and clean-up of residual cement for cement retained prosthesis (14.4%). **Conclusions:** The clinical record keeping for patients with dental implants placed at IMU OHC was low. Appropriate measures and intervention are to be implemented to enhance the record keeping.

**Keywords:** Clinical audit, dental implants, dental records

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### 130. EVALUATION OF THE APPLICATION OF UNDERGRADUATE PRE-CLINICAL REMOVABLE PROSTHODONTIC LABORATORY TEACHING IN GENERAL DENTAL PRACTICE

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**Background:** Pre-clinical removable prosthodontic training is an integral part of undergraduate curriculum. The objectives of the study were to evaluate the application of pre-clinical removable prosthodontic laboratory training in general dental practice and relevance of its teaching in undergraduate curriculum. **Methods:** A descriptive questionnaire was developed to assess the extent of practice of pre-clinical removable prosthodontic lab skills in their dental practice. The responses were evaluated and statistically analyzed with a significance value of  $p < 0.05$ . Three hundred-fifty-seven general dental practitioners participated in the study. **Results:** 91% with 20 years of dental practice responded positively on the application of prosthodontic training in their practice. 55.7% with two years of training agreed to dedicate more time to clinical prosthodontics training. **Conclusions:** 52.9% of the respondents agreed that it would be better to dedicate more time on clinical prosthodontics training rather than pre-clinical removable prosthodontics lab training as a part of the undergraduate prosthodontic curriculum, among which more than 60% of the study participants had two or more years of removable prosthodontics pre-clinical training during dental school. **Practical implications:** Clinical expertise of dental graduate is an essential component in the general dental practice. Hence, there is a need to revisit removable prosthodontic curriculum content and time distribution in undergraduate dental program.

**Keywords:** Application, removable prosthodontics, lab training, dental practice

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### 131. BRIDGING ORAL HEALTH AND PRENATAL CARE: MEDICAL PERSONNEL' INSIGHTS

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**Introduction:** Providing preventive oral health during prenatal care is a recognised strategy for improving pregnant women's access to oral health care, and this study uses a qualitative approach to explore medical personnel's perspectives on the implementation of the Oral Healthcare Program (OHCP) for antenatal mothers in Selangor, Malaysia. **Objective:** The study aimed to explore the strengths, identify the weaknesses, investigate opportunities for improvement, and examine the threats to the OHCP for antenatal mothers from the perspectives of medical personnel. **Methods:** This qualitative study employed three Focus Group Discussions (FGD) and six In-Depth Interviews (IDI) to gather data from two groups of medical personnel: medical officers (MO-MCH) and medical staff nurses/midwives/community nurses (SN-CN-MCH) specifying maternal and child health care. The study was conducted across three districts in Selangor. The data were analysed using a SWOT (Strengths, Weaknesses, Opportunities, and Threats), which was further categorised into three categories: provider-level factors, provider perceived-patient level factors and organisational-level factors. **Results:** The study included six MO-MCH and twelve SN-CN-MCH. Strengths identified included proactive outreach and engagement by healthcare providers, the effective dissemination of oral health knowledge among antenatal mothers as perceived by healthcare providers, and collaborative efforts that strengthened the program's structure. The weaknesses highlighted were time limitations, a lack of awareness of the mothers, and communication gaps between dental and medical staff. Opportunities for improvement are focused on improving communication and coordination, using innovative educational tools to enhance education delivery, and better allocation of resources into antenatal care. Threats included limited resources, high turnover rates of dental officers, and technological barriers in certain demographic areas. **Conclusion:** To improve OHCP effectiveness, it is crucial to address weaknesses and threats, enhance dental-medical communication, and utilise innovative educational tools. Continuous training and better resource allocation are essential for ensuring the long-term success of oral health integration into prenatal care.

**Keywords:** Communication, integrated care, interprofessional collaboration, medical personnel, pregnancy, qualitative study, referral

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## **DOMAIN 4**

# **Traditional and Complementary Medicine in Oral Healthcare**



### 132. CHEMICAL COMPOSITION OF ESSENTIAL OIL FROM LINDERA SUBUMBELLIFLORA KOSTERM AND ITS EFFECT ON THE SUSCEPTIBILITY AND BIOFILM ACTIVITIES OF CANDIDA ALBICANS AND STREPTOCOCCUS MUTANS

Zaini NN, Salleh WM, Arzmi MH, Salihu AS, Ab Ghani N

The chemical composition of the essential oil of *Lindera subumbelliflora* (Lauraceae) was investigated for the first time. The essential oil was obtained by hydrodistillation and fully characterised by gas chromatography (GC) and gas chromatography-mass spectrometry (GC-MS). The antifungal activity of *L. subumbelliflora* essential oil was tested against *Candida albicans* and *Streptococcus mutans* using the broth microdilution assay, whereas the microbial biofilms were determined using a semi-quantitative static biofilm. A total of 28 components (99.6%) were successfully identified, which were characterised by  $\beta$ -eudesmol (14.6%), *cis*- $\alpha$ -bergamotene (11.0%),  $\alpha$ -copaene (8.5%), dodecen-1-ol (8.5%), and (E) nerolidol (8.3%). The essential oil exhibited activity against *Candida albicans* and *Streptococcus mutans* with MIC values of 250 and 500  $\mu$ g/mL, respectively. The essential oil increased the biofilm of *Candida albicans* by 38.25%, however, decreased the biofilm of *Streptococcus mutans* by 47.89% when treated with 500  $\mu$ g/mL. Thus, the essential oil has a promising application in dentistry via inhibition of the growth of *Candida albicans* and *Streptococcus mutans*. However, the antibiofilm activity of the essential oil is only applicable for cariogenic *Streptococcus mutans*.

**Keywords:** Essential oil, *lindera subumbelliflora*,  $\beta$ -eudesmol, antifungal, antibiofilm, *candida albicans*

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### 133. THE EFFECT OF OIL PULLING IN COMPARISON WITH CHLORHEXIDINE AND OTHER MOUTHWASH INTERVENTIONS IN PROMOTING ORAL HEALTH: A SYSTEMATIC REVIEW AND META-ANALYSIS

Jong FJ, Ooi DJ, Teoh SL

**Objectives:** A meta-analytic review was performed to critically synthesize the evidence of oil pulling on improving the parameters of gingival health, plaque control and bacteria counts against chlorhexidine and other mouthwash or oral hygiene practices. **Methods:** Databases including Medline, Embase and bibliographies were searched from inception to 1 April 2023. Randomized controlled trials (RCTs) with 7 days or longer duration of oil pulling with edible oils in comparison to chlorhexidine or other mouthwashes or oral hygiene practice concerning the parameters of plaque index scores (PI), gingival index scores (GI), modified gingival index scores (MGI) and bacteria counts were included. Cochrane's Risk of Bias (ROB) tool and the Grading of Recommendations Assessment, Development and Evaluation (GRADE) framework were employed to determine the quality of evidence. Two authors independently conducted study selection and data extraction. Meta analyses of the effect of oil pulling on the parameters were conducted using an inverse-variance random-effects model. **Results:** Twenty-five trials involving 1184 participants were included. Twenty-one trials comparing oil pulling (n=535) to chlorhexidine (n=286) and non-chlorhexidine intervention (n=205) were pooled for meta-analysis. More than half of the trials (n=17) involved participants with no reported oral health issues. The duration of intervention ranged from 7 to 45 days, with half of the trials using sesame oil. When compared to non-chlorhexidine mouthwash interventions, oil pulling clinically and significantly improved MGI scores (Standardized mean difference, SMD = -1.14; 95% confidence interval [CI]: -1.31, -0.97). Chlorhexidine was more effective in reducing the PI scores compared to oil pulling, with an SMD of 0.33 (95% CI: 0.17, 0.49). The overall quality of the body of evidence was very low. **Conclusions:** There was a probable benefit of oil pulling in improving gingival health. Chlorhexidine remained superior in reducing the amount of plaque, compared to oil pulling. However, there was very low certainty in the evidence albeit the clinically beneficial effect of oil pulling intervention.

**Keywords:** Alternative medicine, dental hygiene, oil pulling, randomized controlled trials

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### 134. ELUCIDATION ON THE EFFECT OF THEOBROMA CACAO AQUEOUS EXTRACT (COCOA) ON THE SUSCEPTIBILITY AND BIOFILM-FORMING ABILITY OF STREPTOCOCCUS MUTANS ON DIFFERENT SIZES AND SHAPES OF NICKEL-TITANIUM AND STAINLESS-STEEL ORTHODONTIC ARCHWIRES

Sinnasamy S, Arzmi MH, Mohd Ali AS

**Introduction:** The extract of Theobroma cacao beans was reported to possess antimicrobial activity against the dental caries pathogen. Meanwhile, Nickel-Titanium (NiTi) and Stainless-Steel (SS) orthodontics archwires are commonly used for aligning teeth in the initial stages of orthodontic treatment. However, the antimicrobial effect of T. cacao on the Streptococcus mutans on the archwires as well as its effect on the biofilm formation is not completely understood. This study aimed to determine the effects of T. cacao on the presence of S. mutans on orthodontic archwires with different materials and sizes. **Methods:** Corresponding 0.014", 0.018", 0.017x0.025, and 0.019x0.025" dimension NiTi and SS archwires were used. To determine the antimicrobial effects of T. cacao on S. mutans, sterile 10 mm archwire sections were soaked in 200 mg/mL of T. cacao aqueous extract for 30 sec, 1 min and 2 min. Later, the archwires were placed on a Mueller-Hinton agar pre-swabbed with S. mutans (Ingbritt), standardized at optical density OD620nm 0.5. Finally, the plate was incubated at 37°C for 24 h and the inhibition zone was measured. To determine the antibiofilm activity of T. cacao on the S. mutans, a 10 mm length sterile archwire was treated with 2 mL of 200 mg/mL of T. cacao for 1 min. Following that, the archwires were transferred into a 6-well plate containing 2 mL BHI broth. Then, 2 mL of S. mutans standardized to an OD620nm 0.5 was inoculated into the well and incubated at 37°C for 24 h. The archwires were transferred into a 2 mL tube containing 2 mL of PBS and sonicated for 1 min. Later, 100 µL of the suspension was collected and the total colony-forming unit was enumerated using the serial dilution method on brain heart infusion agar. BHI and 0.12% chlorhexidine gluconate (CHX) were used as the positive and negative control, respectively. The experiment was conducted in three biological replicates. Scanning electron microscope (SEM) analysis was conducted to observe biofilm formation over orthodontic archwires. **Results:** The present study showed that S. mutans on orthodontic archwires were resistant to treatment with T. cacao aqueous extract. Furthermore, the antibiofilm assay showed that T. cacao-treated archwire had a comparable antibiofilm effect with CHX for 0.017x0.025" NiTi and SS archwires, and 0.018" NiTi. However, they were not statistically significant ( $P>0.05$ ). T. cacao treatment significantly reduced S. mutans biofilm on 0.014" SS archwire ( $P<0.05$ ). In addition, S. mutans cell count was found to reduce on all archwires compared with untreated controls except for 0.014" NiTi archwires where treatment with both CHX and T. cacao showed no difference. The biofilm adhesion was found to be significantly higher on NiTi compared to SS archwires on both 0.018" and 0.019x0.025" sizes ( $P<0.05$ ). Finally, SEM images showed that T. cacao prevented the dispersion of S. mutans biofilm. **Conclusion:** In conclusion, T. cacao does not inhibit the growth of S. mutans on archwires, however, it possesses antibiofilm properties against the bacterium.

**Keywords:** Theobroma cacao, Streptococcus mutans, archwires, antibiofilm, antimicrobial

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### 135. COMPARATIVE EFFECTIVENESS OF PROPOLIS WITH CHLORHEXIDINE MOUTHWASH ON GINGIVITIS—A RANDOMIZED CONTROLLED CLINICAL STUDY

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**Background:** To assess and compare the effectiveness of propolis mouthwash with chlorhexidine mouthwash in the reduction of plaque and gingivitis. **Methods:** A single centre, latin-square cross-over, double masked, randomized controlled clinical trial was conducted on 45 chronic generalized gingivitis subjects who were chosen from the dental clinic of MAHSA University, Malaysia. A total of 45 subjects were randomly assigned into one of the three different groups (n = 15 each) using a computer-generated random allocation sequence: Group A Propolis mouthwash; Group B Chlorhexidine mouthwash; and Group C Placebo mouthwash. Supragingival plaque and gingival inflammation were assessed by full mouth Plaque index (PI) and gingival index (GI) at baseline and after 21 days. The study was divided into three phases, each phase lasted for 21 days separated by a washout period of 15 days in between them. Groups A, B and C were treated with 0.2% Propolis, Chlorhexidine, and Placebo mouthwash, respectively, in phase I. The study subjects were instructed to use the assigned mouthwash twice daily for 1 min for 21 days. On day 22nd, the subjects were recalled for measurement of PI and GI. After phase I, mouthwash was crossed over as dictated by the Latin square design in phase II and III. **Results:** At baseline, intergroup comparison revealed no statistically significant difference between Groups A, B and C ( $p > 0.05$ ). On day 21, one-way ANOVA revealed statistically significant difference between the three groups for PI ( $p < 0.001$ ) and GI ( $p < 0.001$ ). Bonferroni post-hoc test showed statistically significant difference between Propolis and Chlorhexidine mouthwash ( $P < 0.001$ ), with higher reduction in the mean plaque and gingival scores in propolis group compared to chlorhexidine and placebo groups. **Conclusions:** Propolis mouthwash demonstrated significant improvement in gingival health and plaque reduction. Thus, it could be used as an effective herbal mouthwash alternative to chlorhexidine mouthwash. **Trial registration:** The trial was retrospectively registered on 25/07/2019 at [clinicaltrials.gov](https://clinicaltrials.gov) and its identifier is NCT04032548.

**Keywords:** Chlorhexidine, gingivitis, mouthwash, plaque control, propolis

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### 136. CLINICAL AND MICROBIOLOGIC EFFECT OF LOCAL APPLICATION OF CURCUMIN AS AN ADJUNCT TO SCALING AND ROOT PLANING IN PERIODONTITIS: SYSTEMATIC REVIEW

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**Background:** The main aim of periodontal therapy is to halt the progression of periodontitis. Curcumin, one of the main components of Curcumin longa, has been well known to possess antimicrobial, anti-inflammatory, and even anticarcinogenic properties. This systematic review assessed the impact of local application of curcumin in the pocket on the clinical and microbiologic parameters as an adjunct to scaling and root planing in periodontitis patients. **Methods:** The electronic literature search retrieved 61 studies from PubMed, MEDLINE, and ScienceDirect. After screening titles, abstracts, and keywords and reading through these articles, we identified 9 articles meeting all inclusion criteria, which were included for systematic review. **Results:** There was a significant difference in both clinical parameters in a short duration of a month after curcumin chips were placed as an adjunct to scaling and root planing as compared to the control. Local application of curcumin also results in slight to significant reduction in the red complex microorganisms. **Conclusion:** This review suggested that local application of curcumin can be considered as a viable adjunct to mechanical debridement in periodontitis. However, further studies need to be conducted to establish its optimum dose, delivery method, and frequency in achieving the best clinical outcomes.

**Keywords:** Curcumin, dental scaling, microbiology, periodontitis, root planing

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### 137. FORMULATION AND CHARACTERIZATION OF A NOVEL PALM-OIL-BASED $\alpha$ -MANGOSTIN NANO-EMULSION (PO-AMNE) AS AN ANTIMICROBIAL ENDODONTIC IRRIGANT: AN IN VITRO STUDY

Sultan OS, Kantilal HKA, Phaik KS, Choudhury H, Davamani F

**Aim:** To formulate and characterize a palm-oil-in-water-based  $\alpha$ -Mangostin nano-emulsion (PO-AMNE) endodontic irrigant, in order to evaluate its antibacterial efficacy against *Enterococcus faecalis*, *Staphylococcus epidermidis*, and *Candida albicans* biofilms, as well as its capacity to remove smear layer. **Methods:** The solubility of  $\alpha$ -Mangostin in various oils was determined and selected, surfactants and co-surfactants were used for the nano-emulsion trial. PO-AMNE was prepared and optimized. The MIC was performed, and the antimicrobial efficacy was estimated against biofilms. The optimized 0.2% PO-AMNE irrigant antimicrobial efficacy in a tooth model was done using colony-forming units. The treated teeth were processed by scanning electron microscopic examination for debris and smear layer removal. An Alamar Blue assay was used to evaluate cell viability. The optimization of the PO-AMNE irrigant was performed using Box–Behnken statistical design. **Results:** The optimized 0.2% PO-AMNE irrigant was found to have a particle size of 340.9 nm with 0.246 PDI of the dispersed droplets, and a zeta potential (mV) of  $-27.2 \pm 0.7$  mV. The MIC values showed that 0.2% PO-AMNE ( $1.22 \pm 0.02$ ) were comparable to 2% CHX ( $1.33 \pm 0.01$ ), and 3.25% NaOCl ( $2.2 \pm 0.09$ ) had the least inhibition for *E. faecalis*. NaOCl (3.25%) showed the maximum inhibition of *S. epidermidis* ( $0.26 \pm 0.05$ ), whereas 0.2% PO-AMNE ( $1.25 \pm 0.0$ ) was comparable to 2% CHX ( $1.86 \pm 0.07$ ). For *C. albicans*, 2% CHX ( $8.12 \pm 0.12$ ) showed the least inhibition as compared to 0.2% PO-AMNE ( $1.23 \pm 0.02$ ) and 3.25% NaOCl ( $0.59 \pm 0.02$ ). The 0.2% PO-AMNE irrigant was then evaluated for its antimicrobial efficacy against the three biofilms, using colony-forming units. The 0.2% PO-AMNE was comparable to both 3.25% NaOCl and 2% CHX in inhibiting the growth of biofilms. The 0.2% PO-AMNE and 17% EDTA eliminated the smear layer with the lowest mean scores ( $p < 0.001$ ). Finally, 0.2% PO-AMNE was shown to be biocompatible when compared to 17% EDTA, 3.25% NaOCl, and 2% CHX in immortalized oral keratinocyte cells. **Conclusion:** Overall, the formulated 0.2% PO-AMNE irrigant was an effective antimicrobial and biocompatible which could combat endodontic-infection-related polymicrobial biofilms.

**Keywords:** Palm oil,  $\alpha$ -Mangostin, nano-emulsion, antimicrobial, endodontic irrigant

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### 138. THE EFFECT OF TUALANG HONEY ON THE MIGRATION OF HUMAN GINGIVAL FIBROBLAST

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**Introduction:** Tualang honey is harvested from the Tualang tree where Asian rock bees build their hives. It has antibacterial effects against pathogenic bacterial species. **Objectives:** To determine the effect of Tualang honey on the migration of human gingival fibroblast (HGFs) in cell culture. **Materials and methods:** HGFs were cultured in standard medium in a 5% CO<sub>2</sub> incubator at 37°C in a humidified atmosphere. The cells were seeded at a cell density of 10x10<sup>3</sup> cells/well in a 24-well culture plate until 95% confluence. The scratch wound assay was performed on fibroblast monolayer, then the monolayer was washed with phosphate buffered saline to remove cell debris. Cultures were re-fed with 2 ml medium in the presence of four different concentrations of Tualang honey (5%, 1%, 0.3% and 0.02%). Negative control comprised cells treated with growth media alone while the positive control group was treated with 0.1% GenGiGel® mouthwash. Scratch wounds were measured at 0 hour then cultured cells were incubate in CO<sub>2</sub> incubator at 37°C with 5% CO<sub>2</sub>. Scratch wounds were measured and photographed at the beginning, 24-hour, and 48-hour. Wound widths were calculated using ImageJ public domain software. Statistical analysis was carried out using SPSS version 26. A p value <0.05 was considered as statistically significant. **Results:** There was migration effect on HGFs based on scratch wound assay at concentration of 0.02% to 1% in both duration of treatment. The highest migration rate was demonstrated at 0.1% GenGiGel® mouthwash. **Conclusions:** Both GenGiGel® mouthwash and Tualang honey have beneficial effect on HGFs migration, indicating they have ability to repair periodontal wounds.

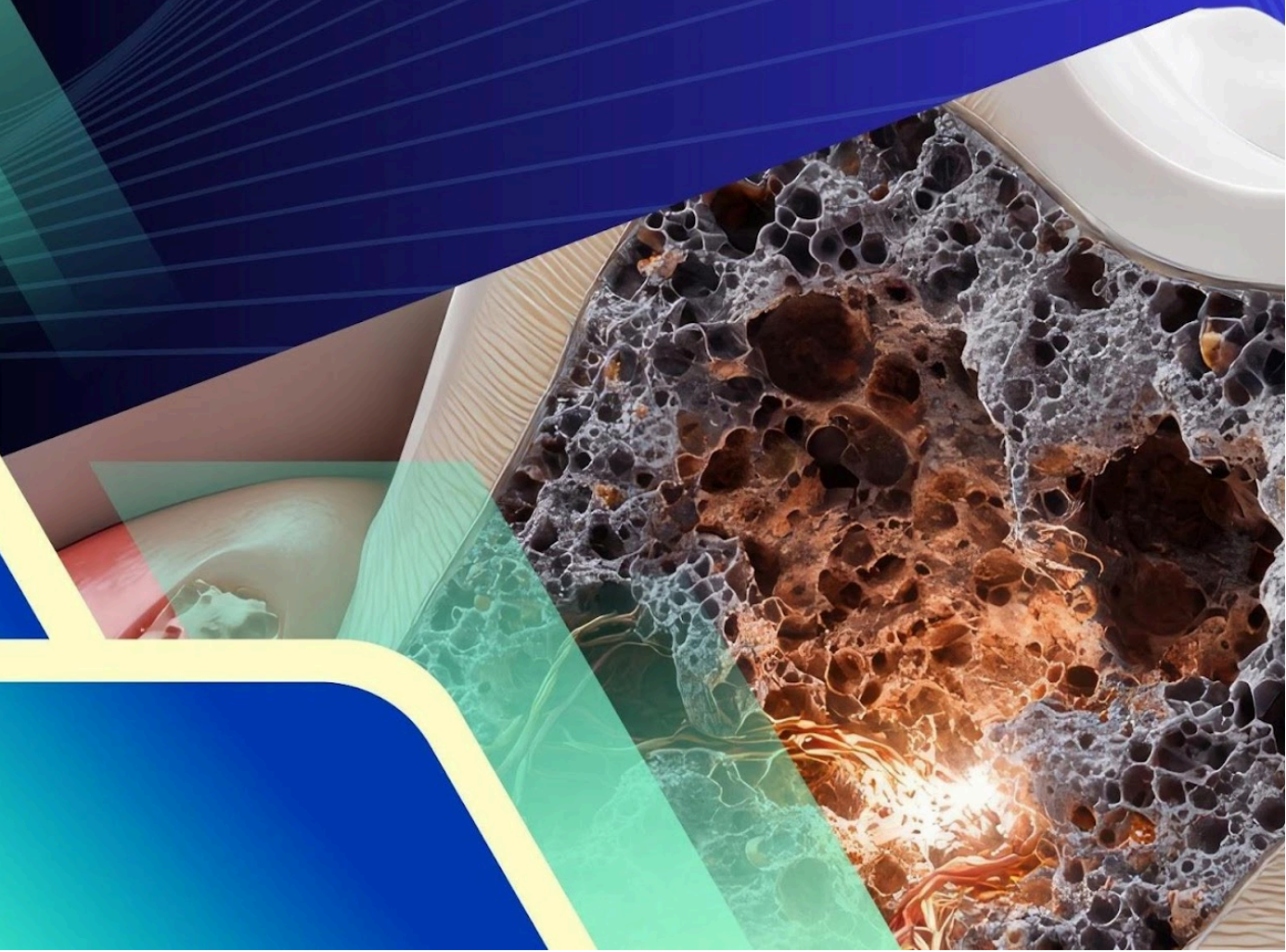
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## **DOMAIN 5**

# **Oral Tissue Engineering and Regenerative Dentistry**



### 139. ELUCIDATING PERIODONTAL FIBROBLAST PROLIFERATION ON HUMAN AMNIOTIC MEMBRANE IMPREGNATED HONEY

*Sabri FS, Taib H, Berahim Z, Ahmad A, Ab Hamid SS*

**Introduction:** Human amniotic membrane (HAM) has emerged as a promising material in periodontal tissue regeneration, due to its exceptional anti-inflammatory properties and its capacity to support cell attachment and proliferation. Similarly, honey has shown potential in promoting periodontal healing by effectively inhibiting bacterial growth and reducing inflammation. Together, these natural substances offer a convincing opportunity for enhancing periodontal regeneration. **Objective:** This study aimed to evaluate the human periodontal ligament fibroblast (HPDLF) cell proliferation on the human amniotic membrane (HAM) impregnated with Tualang honey. **Methods:** HAM was soaked in 0.02% and 0.3% concentration of Tualang honey and incubated for 24 hours. HPDLF cell was seeded onto HAM with honey (HAM+honey) and its proliferation was analysed by using Presto blue reagent for day 1, 3, 7, 14, 21 and 28. HAM samples of day 1, 3, 7, 14, 21 and 28 were prepared for histological analysis by hematoxylin and eosin (H&E) staining. HAM without honey was used as a control. **Results:** The proliferation of HPDLF on HAM+honey and control increased steadily from day 1 until day 28. However, HPDLF proliferation on HAM+honey was higher than HAM without honey. Additionally, histological analysis confirmed that HPDLF cells were well-attached to the HAM. **Conclusions:** The combination of HAM and Tualang honey significantly enhances HPDLF cell growth, demonstrating that these cells can effectively attach to and proliferate on HAM. This duo shows promising potential for use in treating periodontitis and promoting periodontal healing.

**Keywords:** Periodontitis, human amniotic membrane, Tualang honey, scaffold, periodontal regeneration

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#### 140. SALIVARY METABOLOMIC PROFILING FOR DISCRIMINATING PRIMARY SJOGREN SYNDROME FROM HEALTHY CONTROLS: IDENTIFYING POTENTIAL BIOMARKERS- A PILOT STUDY

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**Background:** Salivary biomarkers such as proteins, metabolites, hormones, and nucleic acid can provide biological information for a variety of medical problems such as cancer, stress, systemic disorders, and neurodegenerative and infectious diseases. The proteome and metabolomic alterations observed in saliva appear to match those observed in blood, reflecting the cells' cellular activity and physiological status. **Objectives:** This study aims to identify the potential salivary biomarkers that can help distinguish patients with primary Sjogren syndrome (pSS) from healthy controls. **Methods:** A case-control study of salivary metabolome of two different groups of subjects; 5 control cases, and 5 pSS patients. Salivary metabolites profiling was carried out using 2 analytical approaches: Nuclear magnetic resonance (1H-NMR) and Liquid Chromatography Quadrupole Time-of-Flight Mass Spectrometry (LC-Q-TOF-MS) with HMDB, BRMB, and Metlin databases respectively. Metabolite biomarkers identified will be further interpreted through chemometric analysis (unscrambler software) and statistical packages for the social sciences (SPSS) software to evaluate the diagnostic ability of each of the discriminant metabolites. **Results:** A total of 269 metabolites were obtained using LC-QTOF-MS, there was one metabolite that was associated with pSS which is purine. Purine was significantly upregulated in the saliva of pSS when compared to control (p-value = 0.01). For 1H-NMR, a total of 241 metabolites were found with only 63 metabolites with VIP scores >1. The top 5 upregulated metabolites were mapped into 12 metabolic pathways. **Conclusion:** There was a significant difference in the salivary metabolites profile (purine) between patients with pSS and healthy control subjects thus the study hypothesis was accepted, and the null hypothesis rejected.

**Keywords:** Saliva biomarkers, primary Sjogren syndrome, metabolomics, liquid chromatography-quadrupole time-of-flight mass spectrometry, nuclear magnetic resonance

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## 141. IN VIVO EVALUATION OF A NANOANTIBIOTIC-INTEGRATED COLLAGEN-CHITOSAN SCAFFOLD FOR BONE REGENERATION IN A CRITICAL-SIZE RAT DEFECT MODEL

Zayi NA, Halim ML, Harun AF, Arzmi MH, Subramaniam PK, Mohamad MY

**Background:** Bone loss resulting from periodontal disease, trauma, or anatomical factors is a prevalent challenge in periodontology. This study evaluates the effectiveness of a biodegradable collagen-chitosan scaffold loaded with metronidazole nanoantibiotics to enhance bone regeneration in vivo using a Sprague-Dawley rat skull defect model. The scaffold was surgically placed in critical-size defects, with groups either receiving scaffolds loaded with metronidazole nanoparticles (MNP), empty scaffolds, or no scaffold. The aim of the research is to offer an alternative to conventional non-biodegradable scaffolds, which often require additional surgical removal. **Materials and methods:** A sample size of 18 rats was determined based on the Resource Equation Method, ensuring an adequate sample while anticipating a 20% attrition rate, in line with ethical guidelines for animal testing (3Rs: replacement, reduction, and refinement). Male Sprague-Dawley rats (8 weeks old, 250-300g) were divided into three groups: a scaffold loaded with metronidazole nanoparticles (MNP), an empty scaffold, and a scaffold-free control. Anaesthesia was administered using intraperitoneal injections of ketamine (80 mg/kg) and xylazine (10 mg/kg). A 5 mm defect was surgically created in the skull using a trephine bur, followed by placement of the respective scaffold treatment. The surgical site was closed, and post-operative monitoring focused on pain and healing indicators over a four-week period four weeks post-surgery; X-ray imaging was employed to assess bone healing at the defect site. Radiographic images were analysed using Image J software, measuring the percentage of new bone formation as a function of the original defect size. Bone regeneration was quantified by calculating the area of defect closure based on ROI measurements. Following radiographic evaluation, histological analysis was conducted on decalcified tissue sections, stained with hematoxylin and eosin (H&E), and examined microscopically to evaluate new bone morphology. **Results:** Results demonstrated that the MNP-loaded scaffold group showed significantly higher rates of organisation than the empty scaffold and control groups. The histological analysis confirmed a denser bone regeneration and compact bone formation compared to both within the defect area, suggesting that the MNP-infused scaffold enhances cellular activity and tissue integration. This study highlights the potential of a biodegradable, antibiotic-loaded scaffold to support bone regeneration in critical defects, providing a sustainable solution that reduces the need for secondary surgeries and may be suitable for clinical translation in periodontal applications.

**Keywords:** Bone regeneration; Periodontal disease, Biodegradable scaffold; collagen-chitosan scaffold; metronidazole nanoantibiotics

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## 142. ENHANCED OSTEOGENESIS POTENTIAL OF MG-63 CELLS THROUGH SUSTAINED DELIVERY OF VEGF VIA LIPOSOMAL HYDROGEL

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**Introduction:** The challenges of using VEGF to promote osteoblastic differentiation include a short half-life and a narrow therapeutic window. A carrier system combining hydrogel and liposomes may improve the therapeutic efficacy of VEGF for bone regeneration. This study aimed to investigate the effects of delivery of VEGF via liposomal hydrogel on the osteogenesis of MG-63 cells. **Methods:** Liposomal hydrogel scaffold was fabricated and then characterized in terms of the morphological and chemical properties using FESEM and FTIR. In 2.5D analysis, the MG-63 cells were cultured on liposomal hydrogel + VEGF as the test group. The osteogenic effects of VEGF were compared with the control groups, i.e., hydrogel without liposomes + VEGF, osteogenic medium (OM) supplemented with a bolus of VEGF, and OM without VEGF. Cell morphology, viability, and differentiation and mineralization potential were investigated using FESEM, MTT assay, ALP activity, and Alizarin red staining. **Results:** The characterization of scaffold showed no significant differences in the morphological and chemical properties between hydrogel with and without liposomes ( $p > 0.05$ ). The final 2.5D culture demonstrated that cell proliferation, differentiation, and mineralization were significantly enhanced in the liposomal hydrogel + VEGF group compared with the control groups ( $p < 0.05$ ). **Conclusion:** In conclusion, liposomal hydrogel can be used to deliver VEGF in a sustained manner in order to enhance the osteogenesis of MG-63 cells.

**Keywords:** Hydrogel, liposomes, MG-63 osteoblast-like cells, osteogenesis, vascular endothelial growth factor

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### 143. THE EFFECT OF PLATELET RICH FIBRIN AND PLATELET RICH PLASMA IN SECONDARY ALVEOLAR BONE GRAFTING IN CLEFT LIP AND PALATE PATIENTS: A SYSTEMATIC REVIEW

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**Background:** Cleft lip, alveolus, and palate are the most common congenital abnormalities in the world, occurring in one in seven hundred live births. Secondary alveolar bone grafting (SABG) is usually performed when the permanent canine root shows one-half to two-thirds of root development. To improve the surgical outcome, supplemental grafting materials such as platelet-rich fibrin (PRF) and platelet-rich plasma (PRP) have been used as an adjunct. This review is designed to assess the efficacy of PRF and PRP in improving the outcome of SABG. **Methods:** A comprehensive literature search was performed until 13 October 2022 on MEDLINE, EMBASE, The Cochrane Library, and Pubmed. The full text of potentially relevant studies was reviewed, and only randomised clinical trials (RCTs) were included based on the inclusion criteria. **Results:** A total of 656 studies were screened, of which four were included for final review. All of the four included studies that evaluated the quantitative or qualitative surgical outcome in varied ways. **Conclusions:** Results of this review suggest that both PRF or PRP and control group (without the use of PRF/PRP) achieved similar successful outcomes in bone height, bone density, and bone volume in both qualitative and quantitative assessment.

**Keywords:** Platelet rich fibrin, platelet rich plasma, secondary alveolar bone grating, cleft lip and palate, systematic review

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#### 144. PHYSICOCHEMICAL AND BIOLOGICAL PROPERTIES OF PULP CAPPING AGENTS: A SYSTEMATIC REVIEW OF IN VITRO STUDIES

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**Aim:** The primary aim was to evaluate the physicochemical and biological characteristics of pulp capping materials. **Materials and methods:** The systematic review report adhered to the latest Preferred Reporting Items for Systematic Reviews and Meta-Analysis statements, and the protocol was pre-registered (CRD42023471030) in the PROSPERO database before its commencement. To retrieve relevant literature, electronic searches were conducted using the Medline and Google Scholar databases from January 2000, up to August 2023. The records obtained through our electronic search were managed using a specialized web application for systematic review screening, and data were extracted using a standardized form. The evaluation of potential bias within the studies employed the modified Consolidated Standards of Reporting Trials (CONSORT) checklist specifically designed for reporting in vitro dental material research. **Results:** The results revealed that out of 255 identified records, 16 studies were included. An analysis based on the modified CONSORT checklist identified a moderate risk of bias in the included studies, with compliance scores ranging from 50% to 70%. Studies scoring below 50% were omitted from the discussion because of a higher risk of bias. **Conclusion:** This study concludes that the physicochemical properties of resin-incorporated materials are better than those of calcium silicate cement (CSCs). However, the biological properties of CSCs are superior to those of resin-incorporated materials.

**Keywords:** Biological phenomena, dental caries, dental materials, dental pulp capping, physical phenomena

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## 145. EFFECTIVENESS OF GOLD NANOPARTICLES IN PREVENTION AND TREATMENT OF ORAL MUCOSITIS IN ANIMAL MODELS: A SYSTEMATIC REVIEW

*Choudhury M, Brunton P, Schwass D, Pletzer D, Ratnayake J, Dias G, Tompkins G*

**Background:** Oral mucositis remains a significant complication during cancer therapy with no effective treatment. Gold nanoparticles offer anti-inflammatory, antioxidant properties with low toxicity. This study systematically reviews the literature assessing gold nanoparticles in the management of oral mucositis in animal models. **Methods:** A literature search was undertaken using MEDLINE, Embase, PubMed, and Web of Science databases, using the format for Systematic Review Centre for Laboratory Animal Experimentation. Prior to the review, the protocol was registered in the systematic review register, PROSPERO (registration no. CRD42021272169). Outcome measures included ulceration, histopathological scores, inflammatory mediators, microbial growth, and pain. Study quality was analysed by SYRCL risk-of-bias tool. **Results:** Only one study met the inclusion criteria, documenting reduction in ulceration, inflammatory, and oxidative biomarkers. Exposure to AuNPs prevented inflammatory response induced by 5-fluorouracil in oral mucosa of hamsters. However, a high risk of bias necessitates further research. **Conclusion:** This review identifies a potential therapeutic strategy for prevention and management of oral mucositis. It also provides future direction for gold nanoparticle research in oral mucositis; however, there is lack of sufficient evidence to derive any conclusion. Research with standardized parameters including nanoparticle size, capping agent, surface charge, and appropriate oral mucositis animal models will establish risk-benefit balance and margin of safety for therapeutic use of gold nanoparticles for oral mucositis.

**Keywords:** Animal model, gold nanoparticles, oral mucositis, systematic review

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## **DOMAIN 6**

# **Information and Communication Technology Support Systems of Oral Healthcare**



## 146. VOLUMETRIC ASSESSMENT OF CANINES USING POST-MORTEM COMPUTED TOMOGRAPHY (PMCT) FOR SEXUAL DIMORPHISM IN A MALAYSIAN POPULATION

Harudin MH, Franco A, Jaffar N, Noor MHM, Ibrahim MA, Manica S

**Background:** Recent research has explored volumetric assessment in three-dimensional (3D) imaging procedures for sexual dimorphism. The 3D techniques have enabled a more realistic, accurate, and non-invasive visualization of sex-related anatomical parameters, such as the size and shape of human teeth. **Aim:** To perform sexual dimorphism based on dental tissue volumes of permanent left maxillary and mandibular canines in a Malaysian population. **Methods:** A cross-sectional study was carried out on 220 post-mortem computed tomography (PMCT) scans of Malaysian subjects (114 males and 106 females) aged between 18 and 40 years old. The permanent left maxillary and mandibular canines were analysed based on the volume of their (I) enamel cap, (II) coronal dentine, and (III) root, as well as the combination between the three dental tissue volumes (DTV). 3D Slicer version 4.10.2 computer software was used to perform a semi-automated segmentation of the anatomic regions of interest of each tooth. **Results:** The DTV of the permanent left maxillary and mandibular canines showed sexual dimorphism as the males presented larger DTV than females ( $p < 0.05$ ). After binary logistic regression, the DTV revealed an overall sex classification rate of 60 to 74.1%. The DTV of the permanent left mandibular canine had more discriminant power to correctly classify males and females compared to the left maxillary canine. **Conclusions:** The volumetric assessment of the dental tissues of the permanent left maxillary and mandibular canines could discriminate sex in the Malaysian population. Given the limited classification rate, this approach could act solely as a supplementary tool to existing sex estimation methods.

**Keywords:** Forensic dentistry, sexual dimorphism, sex estimation, post-mortem computed tomography

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## 147. PERSEPSI ANGGOTA KESIHATAN PERGIGIAN TERHADAP PENGGUNAAN FIXED FORMAT REPORT (FFR) KEPAKARAN PERIODONTIK SECARA DIGITAL DI UNIT KEPAKARAN PERIODONTIK NEGERI KEDAH

*Chow CS, Yahaya NH, Sa'idin M, Zakaria N, Ahmad Yaziz Y*

**Latar Belakang:** Pelaporan hasil kerja klinikal menggunakan Fixed Format Report (FFR) telah dimulakan di semua klinik primer dan kepakaran sejak tahun 2023. Selaras dengan Dasar Kesihatan Pergigian Kebangsaan, di mana transformasi digital dan inovasi telah disenaraikan sebagai salah satu bidang keutamaan, penggunaan FFR secara digital amat digalakkan. Kajian ini dijalankan untuk mengenal pasti persepsi anggota pergigian di semua unit kepakaran Periodontik negeri Kedah terhadap penggunaan FFR Kepakaran Periodontik secara digital. **Metodologi:** Borang soal selidik diedarkan menggunakan platform Google Form. Borang soal selidik yang telah divalidasi tersebut mengandungi tiga bahagian. Kumpulan sasaran adalah semua anggota kesihatan pergigian yang bertugas di Unit Kepakaran Periodontik negeri Kedah dan terlibat secara langsung dalam penggunaan empat jenis borang FFR Kepakaran Periodontik. **Hasil Kajian:** Sebanyak 19 orang anggota pergigian telah menjawab soal selidik yang disediakan. Kebanyakan responden menggunakan PG 101B secara manual sepenuhnya (47.4%), PG 211B secara kombinasi manual dan digital (47.4%), PG PER 201H (47.4%) dan PG PER 201 pind. 2/2022 (52.6%) secara digital sepenuhnya. Anggota pergigian di daerah Kota Setar mencatat penggunaan FFR secara digital sepenuhnya yang paling tinggi, iaitu 66.7% ( $p=0.039$ ). Ini diikuti dengan daerah Kuala Muda (25%) dan Baling (0%). Kekangan penggunaan FFR secara digital adalah disebabkan infrastruktur ICT dan sumber manusia yang meliputi kekurangan bilangan anggota serta kemahiran menggunakan komputer yang rendah. **Kesimpulan:** Peratus penggunaan FFR Kepakaran Periodontik secara digital sepenuhnya di semua unit kepakaran Periodontik di negeri Kedah masih rendah. Penambahbaikan segera berkaitan infrastruktur ICT perlu dilaksanakan bagi meningkatkan penggunaan FFR secara digital sepenuhnya.

**Keywords:** Fixed Format Report, *periodontik, digital, manual, persepsi*

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## 148. USER EXPERIENCE AND PERCEIVED BENEFITS OF ORAL HEALTH IMPACT PROFILE MOBILE APPLICATION (OHIPMA)

*Mukhtar IM, Goh NMD, Azmi NN, Masud M*

**Introduction:** Mobile applications (MA) has tremendous impact in academic life and there is lack of MA utilization for academic teaching and learning. **Objective:** This study evaluated user experience and perceived benefits of MA for Oral Health Impact Profile (OHIP), in clinical teaching. **Method:** An iPad equipped with Oral Health Impact Profile Mobile Application (OHIPMA) was used as the survey tool. Validated questionnaires were asked on the patients by 114 clinical year students, and subsequently, the students answered online survey regarding their perception and experience of using OHIPMA. Descriptive analysis and chi-square test were done using IBM SPSS version 27. The results showed that 60% of students owned an iPad with 42% recorded everyday usage. **Results:** The response was positive with 67.5% agreeing it was useful for patients in clinics, and 68.4% thought it was beneficial if it was made available for them online. OHIPMA's potential were given a high rating for records on personal detail (83%), patients treatment (76%), appointments (71%), patients' examination, diagnosis and treatment plan (69%). **Conclusion:** The responses by the students highlighted the user experience and benefits for digital technology, and gathering feedback on OHIP of the patients, could benefit the community in attaining quality health services.

**Keywords:** Mobile application, oral health impact profile, usage, perceived benefits

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## 149. FROM PAPER TO PIXELS: EXPLORING THE ADOPTION AND ACCEPTANCE OF ELECTRONIC DENTAL RECORDS (EDR) IN PENANG INTERNATIONAL DENTAL COLLEGE (PIDC), MALAYSIA

*Kugashini S, Lahari T*

**Introduction:** The use of Electronic Dental Records (EDR) facilitates organized and easy access to patient health information in the dental office. Successful implementation of EDR is dependent on technical, financial and socio-organizational factors. **Objectives:** This study focuses on the implementation of the new EDR system (KUMODENT) with the aim of evaluating its acceptance and adaptation by students, faculty members and clinical staff of PIDC. **Methods:** The entire process of implementation was spread across a 12-month period. An initial SWOT analysis was conducted among faculty members to gauge the general awareness and preparedness. This laid the foundation to a mixed methods study using online questionnaires within 2 months of implementation. This was followed by a series of focus group discussions (FGD) with students, clinical staff and faculty members within 4 months of implementation to understand the experiences of end users. **Results:** The results of SWOT analysis displayed mixed sentiments among faculty members (n=18; mean age=46.6) with apprehensions regarding time management, technological competency and increased workload. The strengths were attributed to accurate record keeping, less paper use and ease of accessibility of patient data. One hundred and fifteen participants (M=25 (22%), F=90 (78 %)) answered the online questionnaire. Participants (49, 43%) perceived the retrieval of data is easier with the EDR system. Themes derived from thematic analysis of the FGDs were “ease of records retrieval”, “device factors”, “interface appeal”, “paperless solution” and “enhanced communication”. **Conclusion:** Implementation of the EDR system in dental learning institutions can be a daunting task with multiple stakeholders and factors that need to be taken into consideration. As the adoption of EDR continues to rise across healthcare sectors in Malaysia, it is crucial to ensure a smooth transition during this adaptation process. Overall positive acceptance of the EDR was noticed with successful change management.

**Keywords:** Digital dental records, EDR adoption, electronic dental record system (EDR), EDR implementation

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## 150. CHALLENGES AND CONCERNS OF INTEGRATING ARTIFICIAL INTELLIGENCE IN DENTAL TECHNOLOGY: A QUALITATIVE STUDY AMONG DENTAL TECHNICIANS IN MALAYSIA

*Sim GSL, Ng YS, Nik Abdul Ghani NR, Chua KH*

**Introduction:** The integration of artificial intelligence (AI) in dentistry has the potential to revolutionise the field of dental technologies. However, dental technicians' views on the use of AI in dental technology are still sparse in the literature, specifically in Malaysia. **Objective:** This study aimed to explore the challenges and concerns of Malaysian dental technicians regarding the use of AI in their dental laboratory practice. **Methods:** This was a qualitative study using in-depth-interview (IDI) as the method of data collection, involving 12 dental technicians who are currently working in Malaysia with at least five years of working experience. The IDIs were recorded, transcribed verbatim and translated. Thematic analysis was conducted using NVivo software 12.6 to identify patterns, themes, and categories within the interview transcripts. **Results:** The analysis revealed three key themes, job security and professional identity that highly overlap with AI applications, ethical considerations on patients' privacy and data security, and the continuous training and support needs for sustainable AI utilisation. **Conclusions:** This research sheds light on the concerns and challenges associated with the integration of AI in dental laboratory practices. Understanding these concerns and addressing the challenges can support the ministry and stakeholders in advancing our dental healthcare industry with the integration of AI technology.

**Keywords:** Artificial intelligence, computer-aided design, dental technician, dental technology, qualitative study

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## 151. SEX AND AGE ASSESSMENT BASED ON MANDIBULAR MORPHOMETRY ANALYSIS VIA DENTAL PANORAMIC TOMOGRAPH—A RETROSPECTIVE STUDY

*Ismail IN, Mohd Samani NN, Subramaniam PK*

**Introduction:** Mandible is the strongest and most durable facial bone. **Methods:** 202 Dental Panoramic Tomograph (DPT) consisted of 116 females and 86 males between ages of 18-34 years old were selected from the computer server at radiology department of Kuliyah of Dentistry ranging from 2010 until 2020. The DPT were viewed on Planmeca Romexis software where linear and angular mandibular parameters were assessed accordingly in millimetres and degree, respectively. Relationship and correlation analysis among the mandibular morphometry measurements with regards to sex and age were tested respectively. **Results:** Four bilateral linear mandibular parameters (maximum ramus breadth, MxRB; minimum ramus breadth, MnRB; coronoid height, CH and condylar height, CdH) showed statistically significant difference ( $p < 0.05$ ) in terms of relationship between sex and mandibular. Meanwhile, only maximum ramus breadth (MxRB) bilaterally, right minimum ramus breadth (MnRB), right coronoid height (CH) and right gonial angle (GA) were found to be statistically significant and correlated with age. Hence, the regression equations for the correlated mandibular measurements were generated accordingly. **Conclusion:** In conclusion, DPT mandibular measurements were proved to be a good tool for sex and age assessment for certain morphometry.

**Keywords:** Mandibular morphometry, dimorphism, sex, age, dental panoramic tomograph

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## 152. DEVELOPMENT OF AN INTEGRATED TAM AND KHAN MODEL ON THE INTENTION TO USE BLENDED LEARNING IN MALAYSIAN ORTHODONTIC POSTGRADUATE PROGRAMME

Said SS, Nasir SH, Abu Bakar N, Sinniah SD, Romli A

**Introduction:** Blended learning educational approach has become more evident since the COVID-19 pandemic. Most studies on blended learning in orthodontics focused on the acceptance, effectiveness, and efficiency of blended learning but were not grounded methodologically on the theoretical modelling. In addition, studies examining the factors affecting behavioural intention to use blended learning are lacking. **Aim:** This cross-sectional descriptive study was aimed to develop an integrated theoretical model that can identify factors that contribute to the intention to use blended learning in Malaysian orthodontic programmes. **Methods:** This study combined factors from an acceptance model, which was the Technology Acceptance Model (TAM), and a blended learning model, which was the KHAN Octagonal Framework, as the foundation for the theoretical modelling. A total of 12 factors were identified from the integrated TAM and Khan model based on the models' dependent and independent variables. The factors were: 1-Perceived Ease of Use, 2-Perceived Usefulness, 3-Attitude, 4-Behavioural Intention, 5-Content Quality, 6-Availability, 7-Accessibility, 8-Effectiveness, 9-Teaching Style, 10-Resource Support, 11-Communication, and 12-Responsiveness. Twelve hypotheses were developed to examine the influence of the TAM and Khan model in order to isolate significant factors that influence the behavioural intention to use blended learning. A questionnaire was distributed to respondents comprising of students and academicians from four universities (UIAM, UM, UKM and UiTM) that offer orthodontic programmes. **Results:** The online questionnaire was validated and had a total of 172 items based on a 5-point Likert scale to address the ranking of the identified factors. A total of 76 respondents completed the questionnaire. Partial Least Squares Structural Equation Modelling (PLS-SEM) analysis using Smart PLS software was utilised to validate the research model and the related factors. The model measurement was used to assess the relationships between factors and their indicators, whereas the model structure was used to evaluate the relationships between the endogenous latent constructs and exogenous latent constructs. 9 out of 12 hypotheses were found to be significant and supported (weight>0.1 and t-value>1.65, p-value<0.001). **Conclusions:** This study was able to develop and validate an integrated TAM and Khan theoretical model. The model identified 9 factors that determine the intention to use blended learning in Malaysian orthodontic programmes. These factors are important components that need to be considered by institutional bodies to ensure students' and academician's attitude towards blended learning is positive, and that the implementation of blended learning is perpetual.

**Keywords:** Blended learning, TAM, Khan model

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### 153. A COMPARATIVE EVALUATION OF STATISTICAL PRODUCT AND SERVICE SOLUTIONS (SPSS) AND CHATGPT-4 IN STATISTICAL ANALYSES

*Shahrul AI, Syed Mohamed AMF*

**Background:** The objective of this study was to assess the accuracy of Chat Generative Pre-trained Transformer 4.0 (ChatGPT-4; OpenAI, San Francisco, CA ) compared to Statistical Product and Service Solutions (SPSS; IBM SPSS Statistics for Windows, Armonk, NY) in performing statistical analyses commonly used in medical and dental research. **Methods:** The datasets were analysed using SPSS (version 26) and ChatGPT-4. Statistical tests included the independent t-test, paired t-test, ANOVA, chi-square test, Wilcoxon signed-rank test, Mann-Whitney U test, Pearson and Spearman correlation, regression analysis, kappa statistic, intraclass correlation coefficient (ICC), Bland-Altman analysis, and sensitivity and specificity analysis. Descriptive statistics were used to report results, and differences between the two tools were noted. **Results:** SPSS and ChatGPT-4 produced identical results for the independent sample t-test, paired t-test, and simple linear regression. In one-way ANOVA, both tools provided consistent F-values, but post-hoc analysis revealed discrepancies in mean differences and confidence intervals. Pearson chi-square and Wilcoxon signed-rank tests showed variations in p-values and Z-values. Mann-Whitney U test had differences in interquartile range (IQR), U, and Z-values. Pearson and Spearman's correlations were consistent, with IQR differences in Spearman. Sensitivity, specificity, and area under the curve (AUC) analyses were consistent, though differences in standard errors and confidence intervals were observed. **Conclusion:** ChatGPT-4 produced accurate results for several statistical tests, matching SPSS in simpler analyses. However, discrepancies in post-hoc analyses, confidence intervals, and more complex tests indicate that careful validation is required when using ChatGPT-4 for detailed statistical work. Researchers should exercise caution and cross-validate results with established tools such as SPSS.

**Keywords:** Statistics, artificial intelligence

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## 154. ARTIFICIAL NEURAL NETWORK AND CONVOLUTIONAL NEURAL NETWORK FOR PREDICTION OF DENTAL CARIES

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Dental caries has high prevalence among kids and adults thus it has become one of the global health concerns. The current modern dentistry focused on the preventives measures to reduce the number of dental caries cases. The employment of machine learning coupled with UV spectroscopy plays a crucial role to detect the early stage of caries. Artificial neural network with hyperparameter tuning was employed to train spectral data for the classification based on the International Caries Detection and Assessment System (ICDAS). Spectra preprocessing namely mean center (MC), autoscale (AS) and Savitzky Golay smoothing (SG) were applied on the data for spectra correction. The best performance of ANN model obtained has accuracy of 0.85 with precision of 1.00. Convolutional neural network (CNN) combined with Savitzky Golay smoothing performed on the spectral data has accuracy, precision, sensitivity and specificity for validation data of 1.00 respectively. The result obtained shows that the application of ANN and CNN capable to produce robust model to be used as an early screening of dental caries.

**Keywords:** Caries, ultra-violet spectroscopy, chemometrics, ANN, CNN

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## 155. PRACTICAL APPLICATIONS OF TELEDENTISTRY DURING THE COVID-19 PANDEMIC IN ASEAN MEMBER STATES – A SYSTEMATIC REVIEW

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**Objective:** The objective of this review is to determine the utilisation and adoption of teledentistry based solutions and technologies during the Covid-19 Pandemic in the Asean region. **Background:** Teledentistry is a branch of telemedicine that has rapidly advanced in the last few years and has the potential to provide solutions to oral health problems of patients and locations that do not have prompt and immediate access to a dentist or dental services. The Covid-19 has increased the adaption of all digital health technologies and teledentistry is no exception. **Methodology:** The study utilized online databases such as Pubmed (Medline), Scopus (Embase) and CINAHL for the purpose of document search. Newcastle Ottawa (NOS) scale was used to determine the quality of the studies included in our systematic review. PRISMA guidelines were used as the criteria for reporting items in the systematic review. **Results:** A total of 1297 documents were found after applying the search criteria and the keywords for the selected study. After applying the Prisma guidelines, removal of duplicates and irrelevant entries, 10 studies that were conducted during the Covid-19 pandemic were selected, fitting the inclusion criteria. All the studies included were evaluated for quality and risk of bias through the Newcastle Ottawa scale. Only high-quality studies were included for the final review. **Conclusion:** Teledentistry is a cost-effective solution to screen, diagnose and treat dental patients from a distance. Teledentistry also has the potential to continue seamless continuation of dental education to dental students, during disruptive and non-disruptive periods. ASEAN countries should fully utilise the potential of teledentistry, however sound and effective legislation would be the key first step to achieving that potential.

**Keywords:** ASEAN, dental health, dentistry, digital health, teledentistry, telemedicine

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## 156. ORTHODONTIC TREATMENT WITH MINISCREW ANCHORAGE: ANALYSIS OF QUALITY OF INFORMATION ON YOUTUBE

Yahya MA, Wang GM, Nimbalkar S

**Introduction:** The evaluation of the quality of information (QOI) and clarity of information (COI) among oral health-related videos on the video-streaming Web site YouTube is scarce. This study evaluated QOI and COI regarding temporary anchorage devices contained within videos uploaded by dental professionals (DPs) on YouTube. **Methods:** YouTube videos were systematically acquired with 4 search terms. The top 50 videos per search term by the number of views were stored in a YouTube account. A set of inclusion/exclusion criteria were applied, videos were assessed for viewing characteristics, a 4-point scoring system (0-3) was applied to evaluate QOI in 10 predetermined domains, and a 3-point scoring system (0-2) was applied to evaluate COI. Descriptive statistical analyses and intrarater and interrater reliability tests were performed. **Results:** Strong intrarater and interrater reliability scores were observed. Sixty-three videos from the top 58 most-viewed DPs were viewed 1,395,471 times (range, 414-124,939). Most DPs originated from the United States (20%), and orthodontists (62%) uploaded most of the videos. The mean number of reported domains was  $2.03 \pm 2.40$  (out of 10). The mean overall QOI score per domain was  $0.36 \pm 0.79$  (out of 3). The "Placement of miniscrews" domain scored highest ( $1.23 \pm 0.75$ ). The "Cost of miniscrews placement" domain scored the lowest ( $0.03 \pm 0.25$ ). The mean overall QOI score per DP was  $3.59 \pm 5.64$  (out of 30). The COI in 32 videos was immeasurable, and only 2 avoided using technical words. **Conclusions:** The QOI related to temporary anchorage devices contained within videos provided by DPs through the YouTube Web site is deficient, particularly in the cost of placement. Orthodontists should be aware of the importance of YouTube as an information resource and ensure that videos related to temporary anchorage devices contain comprehensive and evidence-based information.

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**DOMAIN 7**

# **Digital Technologies in Dentistry**

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## 157. PERFORMANCE OF GENERATIVE AI MODELS IN THE TREATMENT PLANNING FOR COMMON DENTAL CASE-BASED SCENARIOS

*Magendran A, Vasu V, Telang L*

**Introduction:** Large language models (LLMs) are advanced generative AI (artificial Intelligence) tools that have been extensively trained on large datasets, allowing them to generate human-like text with remarkable precision. These generative AI models can become easy tools for everyday clinical decision making and simplify search methodology for dental students and early career dentists. The aim of this study was to compare the performance of latest generative AI models in the treatment planning for common dental case-based scenarios. **Methods:** Ten real-life case-based scenarios for common dental problems were prepared and verified for technical accuracy and level of difficulty. These were tested on Chat Sonic and Google Gemini 1.0 pro for generation of treatment plan. The responses given by the AI platforms were assessed by dental faculty (n=10) using AI generated rubrics and scores were provided. **Results:** Mean scores for each case-based treatment plans were calculated and compared for interrater reliability. A strong agreement between scores for treatment plans provided by the gen AI models was noticed (Cohen's kappa value= 0.87). Written feedback provided by the dental faculty suggested that the responses were easy to understand, relevant and relatable to clinical practice. Logical consistency and completeness of the responses were also positive attributes. **Conclusion:** Large Language Models (LLMs) have demonstrated their usefulness in addressing the learning needs of students across various fields of dentistry. Our study's findings indicate that generative AI models have the potential to assist dental students in making clinical decisions. However, while the current generative AI models cannot replace dentists in clinical decision-making, their performance is expected to improve in the future, leading to responses that are more human-like.

**Keywords:** Large language models (LLMs), generative AI, treatment planning, clinical decision making

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## 158. A MORPHOMETRIC APPROACH TO MORPHOLOGY ANALYSIS OF PALATAL RUGAE IN SIBLING GROUPS

*Tey SN, Syed Mohamed AM, Marizan Nor M*

**Introduction:** Recent advances in imaging technologies, such as intra-oral surface scanning, have rapidly generated large datasets of high-resolution three-dimensional (3D) sample reconstructions. These datasets contain a wealth of phenotypic information that can provide an understanding of morphological variation and evolution. The geometric morphometric method (GMM) with landmarks and the development of sliding and surface semilandmark techniques has greatly enhanced the quantification of shape. **Objective:** This study aimed to determine whether there are significant differences in 3D palatal rugae shape between siblings. **Methods:** Digital casts representing 25 pairs of full siblings from each group, male-male (MM), female-female (FF), and female-male (FM), were digitized and transferred to a GM system. The palatal rugae were determined, quantified, and visualized using GMM computational tools with MorphoJ software (University of Manchester). Principal component analysis (PCA) and canonical variates analysis (CVA) were employed to analyze palatal rugae shape variability and distinguish between sibling groups based on shape. Additionally, regression analysis examined the potential impact of shape on palatal rugae. **Results:** The study revealed that the palatal rugae shape covered the first nine of the PCA by 71.3%. In addition, the size of the palatal rugae has a negligible impact on its shape. Whilst palatal rugae are known for their individuality, it is noteworthy that three palatal rugae (right first, right second, and left third) can differentiate sibling groups, which may be attributed to genetics. **Conclusion:** Therefore, it is suggested that palatal rugae morphology can serve as forensic identification for siblings.

**Keywords:** Digital casts, forensic odontology, geometric morphometric, morphology, palatal rugae, siblings

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## 159. APPLICATION OF ARTIFICIAL INTELLIGENCE IN CONE-BEAM COMPUTED TOMOGRAPHY FOR AIRWAY ANALYSIS: A NARRATIVE REVIEW

*Ismail IN, Subramaniam PK, Chi Adam KB, Ghazali AB*

**Introduction:** Cone-beam computed tomography (CBCT) has emerged as a promising tool for the analysis of the upper airway, leveraging on its ability to provide three-dimensional information, minimal radiation exposure, affordability, and widespread accessibility. The integration of artificial intelligence (AI) in CBCT for airway analysis has shown improvements in the accuracy and efficiency of diagnosing and managing airway-related conditions. **Objective:** This review aims to explore the current applications of AI in CBCT for airway analysis, highlighting its components and processes, applications, benefits, challenges, and potential future directions. **Methods:** A comprehensive literature review was conducted, focusing on studies published in the last decade that discuss AI applications in CBCT airway analysis. **Results:** Many studies reported the significant improvement in segmentation and measurement of airway volumes from CBCT using AI, thereby facilitating accurate diagnosis of airway-related conditions. In addition, these AI models demonstrated high accuracy and consistency in their application for airway analysis through automated segmentation tasks, volume measurement, and 3D reconstruction, which enhanced the diagnostic accuracy and allowed predictive treatment outcomes. **Conclusion:** Despite these advancements, challenges remain in the integration of AI into clinical workflows. Furthermore, variability in AI performance across different populations and imaging settings necessitates further validation studies. Continued research and development are essential to overcome current challenges and fully realize the potential of AI in airway analysis.

**Keywords:** Cone-beam computed tomography, CBCT, artificial intelligence, AI, airway analysis

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## 160. ORTHOGNATHIC SURGERY MADE EASY WITH 3D PRINTING: CLINICAL EXPERIENCE AND SHARING OF OUR METHODS

*Tham YW, Maisi S, Baharom A, Lee JJK, Muthusamy R*

**Introduction:** The realm of orthognathic surgery has faced tremendous transformation with the introduction of virtual surgical planning (VSP) and 3D technology in recent years. This preoperative process uses computer software to simulate surgical procedures virtually in which planning and rehearsals of surgical procedures are done completely within a virtual 3D environment. Conventionally, the planning of orthognathic surgery involves the tracing of 2D cephalogram, studying dental cast models on articulators and fabrication of surgical splints using facebow mounting and bite registration. The recognized drawbacks of traditional surgical planning include inherent lack of 3D insight into anatomical structures and failure in identifying facial reference planes due to overlapping of the different bony structures. Implementation of 3D technologies including fabrication of stereolithographic models, cutting guides, surgical plates, splints, and even patient-specific implants show synergistic benefits including precision, patient-specificity, high surgical safety, excellent surgical outcome, time efficiency and cost effectiveness. We aim to evaluate the efficacy of VSP and 3D printing technology and to describe our methods in conducting VSP and the application of 3D printing technology in orthognathic surgery. **Methods:** 10 patients underwent orthognathic surgeries in which VSP and 3D printing technology were used. Surgical and post- operative outcomes were documented, tabulated, compared and analyzed. **Results:** The mean operative time was 438 minutes (range: 300 - 900 minutes) and the mean length of ward stay was 5.6 days (range: 2 - 8 days). There were no major complications for all patients. **Conclusion:** VSP and 3D printing technology offer a level of versatility that empowers surgeons to conceptualize and implement intricate, complex, and comprehensive orthognathic surgeries. Astute application of knowledge is crucial to expand the boundaries of the surgical landscape to its full potential.

**Keywords:** VSP, 3D printing technology, orthognathic surgery

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## 161. IMPACT ABSORPTION OF 3D PRINTED MOUTHGUARD MATERIAL IN SELECTED PRINTING ANGULATIONS

*Idris SS, Li CY, Thida A, Kaung ST, Zhu QS, Yumi T, Hiroshi C*

**Introduction:** Nowadays, mouthguard can be produced based on digital impression using intraoral scanner. However, the relationship between printing angulations and material properties during printing has not been fully investigated. **Objective:** To assess the impact absorption on 3D printed mouthguard material in selected printing angulations. **Methods:** A standard tessellation language (STL) file of a circle mouthguard sheet with 50mm diameter and 2mm thickness used to design the samples using the Cara® Print 4.0 software (Kulzer Japan) at the selected printing angulation at 0°, 10°, 20°, 30°, 40° and 50° used and 18 samples produced using the Dima® Print Soft Splint (Kulzer Japan) blue. All samples stored for 24 hours at 23°C before testing. Impact force generated by releasing the stainless steel ball from 600 mm above each sample using a modified IM-201 impact testing machine (Tester Sangyo Co., Saitama, Japan). **Results:** The lowest maximum force was 403.5N (samples 10° angulations) and the highest maximum force was 491.2N (samples 50° angulations). The highest maximum impact force time was 0.91ms (samples at 10° angulations) and the lowest maximum impact force time was 0.40ms (sample at 0° angulations). **Discussion:** Printing angulations had significant influence on the impact absorption of 3D mouthguard sheet material. There is a significant result in between groups reported for selected printing angulation. The lowest impact absorption with the longest impact force time are preferred to prevent the oral injuries due to impact during sports. **Conclusion:** The relationship between printing angulations and impact absorption properties was investigated for 3D printed soft material of mouthguard. Printing angulations has significantly influenced the impact of absorption properties.

**Keywords:** Impact absorption, mouthguard, printing angulations

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## 162. LONGITUDINAL ANALYSIS OF DIAGNOSTIC ACCURACY OF PANORAMIC RADIOGRAPHY IN ORAL PATHOLOGY

*Nayak S, Sahoo S, Chaturvedi M, Jerry A, Al-Ghaith AR, Ausare SS, Bagewadi S*

**Objective:** The purpose of this 5-year longitudinal study was to assess the diagnostic accuracy of panoramic radiography (PR) in identifying oral pathology at a tertiary care facility. **Methods:** A retrospective review of patient files was done, encompassing those of patients who had PR for suspected oral lesions, followed by a biopsy. At various times, several diagnostic accuracy metrics were computed, such as sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV), and diagnostic odds ratio (DOR). **Results:** The research had 250 patients in total. In terms of identifying oral pathology, PR showed a sensitivity of 85% and a specificity of 90%. There were 80% and 92% PPV and NPV, respectively. With a computed DOR of 25, PR's total discriminating power was found to be high. **Conclusion:** In summary, PR consistently demonstrates great diagnostic accuracy in identifying oral pathology at a tertiary care facility. These results confirm that PR is a useful screening technique for oral lesions in standard clinical practice. In order to overcome PR's shortcomings and investigate methods for enhancing its diagnostic effectiveness, more investigation is necessary.

**Keywords:** Diagnostic accuracy, longitudinal analysis, oral pathology, panoramic radiography, tertiary care center

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### 163. A COMPARATIVE ANALYSIS OF BACTERIAL ADHESION ON DIFFERENT LONG-TERM PROVISIONAL FIXED PROSTHESES FABRICATED BY CAD/CAM MILLING, 3D PRINTING, AND HEAT CURE TECHNIQUE: AN IN VIVO STUDY

*Kumari MK, Mohapatra A, Rath S, Choudhury GK, Garhnayak M, Mohapatra A*

**Objective:** This study compares the bacterial susceptibility to three different provisional restorations manufactured with different laboratory techniques, i.e., heat cure, CAD/CAM, and 3D printing. **Materials and methods:** Totally, 45 health patients with age group of 30–60 years undergoing complete veneer crown treatment were selected for the study and divided into three groups with 15 samples in each as Group 1: the crowns were made from polymethyl methacrylate polymer fabricated by the conventional heat cure method, Group 2: the crowns were made from polymethyl methacrylate fabricated by subtractive manufacturing CAD/CAM method, and Group 3: the crowns were made from oligomers fabricated by additive manufacturing 3D printing. The samples were examined for bacterial adherence at scanning electron microscope. The colony-forming units (CFUs) were calculated, and statistically analyzed. **Results:** It has been determined that the digitally fabricated provisional restorations prove to be superior in terms of surface topography than to the conventionally fabricated provisional restorations. **Conclusion:** The study concludes that 3D-printed provisional restorations are more precise with reduced bacterial susceptibility than milled ones.

**Keywords:** 3Dprinting, bacterial susceptibility, CAD/CAM, PMMA polymethyl methacrylate

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## 164. DIGITAL TECHNOLOGIES IN DENTISTRY: A STUDY ON CAD/CAM, 3D PRINTING, DIGITAL IMPRESSIONS AND DIGITAL X-RAY AMONG DENTAL PROFESSIONALS - A CROSS-SECTIONAL STUDY

Saeidi AA, Fareed WM, Alshahrani AA, Mashhour N, Naseem F, Vasanth S, Fathima L

**Background:** Digital technologies such as CAD/CAM, 3D printing, digital impressions, and digital X-rays are increasingly being integrated into modern dental practices. These advancements offer significant improvements in precision, workflow efficiency, and patient care. However, the extent of adoption and integration of these technologies varies among practitioners due to factors such as cost, training, and perceived benefits. This study aims to evaluate the adoption and implementation of CAD/CAM systems, 3D printing, digital impressions, and digital X-rays among dental practitioners. It seeks to identify the factors influencing their integration, the challenges faced, and the perceived impact on clinical outcomes and patient satisfaction. **Materials and methods:** A cross-sectional survey was conducted among dental practitioners, including general dentists and specialists, using an online questionnaire. The survey covered demographic information, knowledge and awareness of digital technologies, adoption rates, barriers to implementation, and perceived impact. Descriptive statistics and multivariate logistic regression were used to analyse the data and identify key factors influencing technology adoption. **Results:** The survey revealed that while digital technologies are widely recognized for their benefits, the rate of adoption varies significantly among practitioners. CAD/CAM systems and digital X-rays were the most commonly adopted technologies, while 3D printing and digital impressions had lower uptake due to higher costs and a steeper learning curve. Practitioners in larger, urban-based practices were more likely to adopt these technologies compared to those in smaller or rural practices. Major barriers to adoption included high initial investment, lack of training, and challenges with system integration. **Conclusion:** The study highlights both the opportunities and challenges associated with the adoption of digital technologies in dental practice. While these tools have the potential to improve clinical outcomes and patient satisfaction, cost and accessibility remain significant barriers. Efforts to make these technologies more affordable and provide comprehensive training may accelerate their adoption, ultimately enhancing dental care delivery.

**Keywords:** Digital technologies, adoption, 3D printing, digital impressions, digital x-ray

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## 165. ASSESSMENT OF QUALITY IMPROVEMENT OF SIMULATION-BASED LEARNING USING AN EVIDENCE-BASED FRAMEWORK IN DENTAL EDUCATION

*Zain E, Talreja N, Hesarghatta Ramamurthy P, Muzaffar D, Rehman K, Khan AA, Jubapu AS, Termizi A*

**Introduction:** Simulation-based education is of paramount importance in a dental pre-clinical setting. Hence, continuous quality improvement is crucial to optimize students' knowledge and clinical skills. This study aimed to evaluate the impact of evidence-based simulation learning (EBSL) compared with traditional-based simulation learning (TBSL) using Plan-Do-Study-Act (PDSA) model. **Materials and methods:** This quality improvement project was undertaken at a private university. Guided by the PDSA model, rubber dam application tasks were conducted in the simulation lab in 2 phases. Phase 1 included TBSL and phase 2 included EBSL comprising of 2 PDSA cycles. 'Plan' stage involved obtaining feedback from students and the concerned staff. 'Do' stage included implementation of EBSL in eight steps adopted from Higgins's framework. 'Study' stage evaluated the outcomes and in 'Act' stage amendments were made to the first EBSL cycle. In the second PDSA cycle re-implementation and evaluation of the rubber dam application exercises were carried out. Descriptive data were presented as percentages and mean scores were compared using paired t-test. **Results:** Thirty-seven year 2 students participated in this study. A significant improvement in the mean scores was observed between TBSL and EBSL ( $3.02 \pm 0.16$  and  $3.91 \pm 0.27$ , respectively,  $p < .001$ ) using PDSA model with the highest mean score for rubber dam application in the second PDSA cycle for EBSL ( $4.00 \pm 0.01$ ). Ninety-five per cent of the students provided positive feedback pertaining to EBSL. **Conclusion:** EBSL was effective in achieving high student satisfaction, desired knowledge, and skills required during simulation-based exercises. The PDSA cycle can be considered to optimize pre-clinical skills learning.

**Keywords:** Dental education, evidence-based simulation, quality improvement, rubber dam

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## 166. DIFFERENT IMPLANT DIAMETERS AND THEIR EFFECT ON STRESS DISTRIBUTION PATTERN IN 2-IMPLANT MANDIBULAR OVERDENTURES: A 3D FINITE ELEMENT ANALYSIS STUDY

Patil PG, Seow LL, Uddanwadikar R, Pau A, Ukey PD

**Statement of problem:** The edentulous mandible is commonly treated with a 2-implant overdenture. A change in diameter of the implants may affect the biomechanical behavior of the overdenture, but information on these effects is lacking. **Purpose:** The purpose of this 3D finite element analysis study was to evaluate the biomechanical behavior of 2-implant mandibular overdentures (2IMO) and their individual components by using implants of different diameters. **Material and methods:** A 3D mandibular model was obtained from the cone beam computed tomography (CBCT) images of a 59-year-old edentulous man, and a 3D denture model was developed from intraoral scanning files in the Mimics software program. A 3D model of different diameters of implants (2.5 mm, 3.0 mm, 3.5 mm, and 4.0 mm) with a LOCATOR attachment was developed in the Solidworks software program. Two same-sized implants were inserted in the mandibular model at 10 mm from the midline in the 3Matics software program. A vertical load of 100 N was applied on the first molar region on the right side or both sides in the ANSYS software program. The maximum von Mises stresses and strains were recorded and analyzed. **Results:** Stresses within the implants decreased with an increase in diameter (from 2.5 mm to 3 mm, 3.5 mm, and 4.0 mm) of the implants. The highest stresses were observed with 2.5-mm-diameter implants (0.949 MPa under unilateral and 0.915 MPa under bilateral loading) and the lowest with Ø4-mm implants (0.710 MPa under unilateral and 0.703 MPa under bilateral loading). The strains on the implants ranged between 0.0000056 and 0.0000097, and those on the mandible ranged between 0.0000513 and 0.0000566 across all diameters of the implants without following a specific trend. **Conclusions:** In 2IMO, the stresses in the implants and mandible decreased with an increase in the diameter of the implants. The implants of lesser diameter (2.5 mm) exhibited the highest stresses and strains, and the implants of the largest diameter (4 mm) exhibited the lowest stresses and strains under unilateral and bilateral loading conditions.

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## **167.DIGITAL WORKFLOW AND VIRTUAL VALIDATION OF A 3D-PRINTED DEFINITIVE HOLLOW OBTURATOR FOR A LARGE PALATAL DEFECT**

*Jamayet NB, Farook TH, Ayman AO, Johari Y, Patil PG*

This clinical report describes how a hollow obturator prosthesis was designed and fabricated for an 82-year-old partially edentulous patient with a large palatal defect. Computer-aided design (CAD) was used to design, articulate, and align the mandibular denture with the obturator prosthesis. The prosthesis was printed, adjusted chairside, rescanned, and made hollow by using a CAD software program. The prosthesis was printed in resin with a dental 3D printer. Quantitative evaluations of clinical (prosthesis dimensions, rest, and occlusal vertical dimensions) and virtual (surface area, volume, weight, interpoint mismatches, spatial overlap) parameters found that the 3D-printed prosthesis required an additional 5% chairside modification. The greatest differences in volume (24.7% less) and weight (22.2% less) were observed when the modified obturator bulb was made hollow via CAD. Hollowing the bulb, therefore, reduced the spatial overlap in volume by 16.8%.

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## 168. CLINICAL OUTCOMES OF IMPLANT-SUPPORTED AND TOOTH-SUPPORTED FIXED PROSTHESES FABRICATED FROM DIGITAL VERSUS ANALOGUE IMPRESSION: A SYSTEMATIC REVIEW AND META-ANALYSIS

*Mahat NS, Shetty NY, Kohli S, Jamayet NB, Patil P*

**Objective:** To analyze the clinical outcomes of implant-supported prostheses and tooth-supported fixed prostheses, fabricated from digital and conventional impression. **Materials and methods:** The literature search was carried out on two electronic databases (PubMed and Cochrane Library). Randomized controlled trials (RCT) published from January 2011 to September 2022 were included. The bias risk was evaluated using Cochrane Risk of Bias Tool 2.0. Further screening was done for meta-analysis according to modified Newcastle-Ottawa scoring criteria. Forest plot was generated using a statistical method of inverse variance of random effect with 95% confidence interval. **Results:** A total of 8 randomized controlled trials were included for systematic review out of which four studies were based on tooth-supported fixed prosthesis and remaining four were based on implant-supported prosthesis. Further screening was conducted and three studies were eligible for meta-analysis. Tooth-supported fixed prosthesis fabricated from digital impression showed no significant difference in the marginal fit in any region measured, except for occlusal region where conventional impression showed more favorable marginal fit. Implant-supported prosthesis fabricated from digital impression showed survival rates ranging from 97.3 to 100% and there was no statistically significant difference in marginal bone loss ( $p = 0.14$ ). **Conclusion:** Implant-supported prostheses fabricated from digital and conventional impressions show no significant differences in their clinical outcomes. Tooth-supported fixed prostheses fabricated from digital impression have shown favorable findings in terms of marginal fit. Despite that, there is still lack of clinical trials with larger sample size and longer follow-up periods. Future studies that fulfill these two criteria are deemed necessary.

**Keywords:** Dental diseases, fixed prosthodontics

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## **169. THE USE OF INTRAORAL SCANNING AND 3D PRINTED CASTS TO FACILITATE THE FABRICATION AND RETROFITTING OF A NEW METAL-CERAMIC CROWN SUPPORTING AN EXISTING REMOVABLE PARTIAL DENTURE**

*Patil PG, Lim HF*

Fabricating a new crown to retrofit with an existing removable partial denture (RPD) is a complex procedure for both clinician and dental laboratory technician. The presented technique facilitates the fabrication and retrofitting of a metal-ceramic crown onto the principal abutment of the existing RPD by using 2-step intraoral scanning (with and without the RPD in place) and 2 different 3-dimensionally printed casts. The technique enables the dental laboratory technician to precisely reproduce the retentive areas, guiding planes, and rest seats on the retrofitted crown.

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# **DOMAIN 8**

## **Others**



## 170. ASSESSING ECO-FRIENDLY DENTAL PRACTICES: A STUDY OF AWARENESS AND ATTITUDES AMONG UNDERGRADUATE DENTAL STUDENTS OF PENANG INTERNATIONAL DENTAL COLLEGE.

Ahmad Siddiqui FS, Lim D, Amira NA, Chin FL

**Introduction:** The escalating threat of global warming has underscored the urgency of environmental responsibility across all sectors. Consequently, waste management and resource conservation have become paramount considerations in shaping environmental policies. **Objectives:** This study sought to investigate the ecological consciousness within the dental field by assessing the awareness and disposition of dental students at Penang International Dental College (PIDC) in Malaysia towards eco-friendly dental practices. **Methods:** Employing a cross-sectional, descriptive design, the study utilized a validated semi-structured questionnaire to gather data from PIDC students. The data collected was nominal and therefore analyzed using appropriate descriptive statistics (proportion, per cent, frequency) and inferential statistics (Chi-square test). **Results:** The analysis revealed a concerning lack of comprehensive understanding regarding eco-friendly dentistry practices amongst the student body. However, a hearteningly positive attitude towards environmental sustainability in dentistry was demonstrably present. Notably, final year students exhibited the highest level of awareness, while year three students displayed the least. Interestingly, a consistent and positive disposition towards implementing eco-friendly practices was observed across all year groups. **Conclusion:** In conclusion, the study suggests a critical need to bridge the knowledge gap regarding eco-friendly dentistry amongst PIDC students. Despite this, their demonstrably positive attitude signifies a promising foundation for fostering a culture of environmentally responsible dental practices within the institution. By prioritizing educational initiatives focused on eco-dentistry, dental educational institutions can take a significant step towards achieving a more sustainable dental environment.

**Keywords:** Environmental dentistry, dental students, sustainability in dentistry, dental education, attitude of health personnel.

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## **171. EFFECTIVENESS OF PERIAPICAL RADIOGRAPHY TRAINING KIT FOR DENTAL UNDERGRADUATES: A PRELIMINARY STUDY**

*Ahmad Fauzi A, Md Ashar NA, Kamal I, Kamar SS*

Rejected periapical radiographs among dental undergraduates are commonly caused by misplacement of the radiographic armamentarium. Proper positioning of the radiographic armamentarium through supervision by a dental radiographer is a way to improve radiographic taking among dental undergraduates. However, the number of trained staff to provide continuous training among dental students in radiographic taking is usually inadequate in most dental institutions, including UKM. To overcome this problem, a periapical radiography training kit (PRTK) is potentially useful as a self-directed learning aid to improve periapical radiographic skill among dental students. This study is aimed to determine the effectiveness of the PRTK and demonstration videos in radiographic taking among dental undergraduates. This type of study is an experimental (parallel group design) to compare the rejection rate between a group of students who are exposed to the radiography training kit (trial group) and a group of students who are not exposed to the intervention (control group). This study involved a convenient sampling of 10 students within the clinical year (Year 4 and Year 5) who had at least one rejected radiograph at undergraduates' polyclinics from March until July 2022. Results showed the mean rank of the radiograph rejection rate in the trial group was lesser than the control group, following the intervention period. In addition, there is a statistically significant difference between the means of radiograph rejection rate before and after exposure to the PRTK ( $p$ -value < 0.05). In conclusion, PRTK is an efficient tool to facilitate dental undergraduates in improving their radiographic skills.

**Keywords:** Periapical, radiography, undergraduates

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## 172.EFFECTS OF CLEANING AGENTS ON LIGHT TRANSMITTANCE OF POLYPROPYLENE DENTAL MATERIAL

*Liew LH, Soh EX, Yahya NA, Mohd Razi R*

Polypropylene is commonly used as a clear plastic retainer in orthodontics. Maintaining translucency is crucial for aesthetic appeal. Previous studies have primarily focused on commercial chemical cleaning agents, but the effects of baking soda, vinegar and Polident® Pro Retainer & Guard remain unexplored. The aim of this study was to evaluate the effects of baking soda, vinegar, and Polident® Pro Retainer & Guard as cleaning agents on the translucency of polypropylene dental material. The objectives were to compare the light transmittance of polypropylene dental material at baseline and after 30 days of exposure to the above-mentioned cleaning agents and to analyse the mean difference in light transmittance among the cleaning agents after the 30-day period. Eighty-five thermoformed polypropylene thermoforming foil of 1-mm thickness (Erkolign, Erkodent) with the dimensions of 50.0mm x 35.0mm were exposed to different cleaning agents (10% baking soda solution, 5.0% vinegar, 2.5% vinegar, Polident® Pro Retainer & Guard, and distilled water) for 30 days. Light transmittance was measured at baseline and after 30 days. Light transmittance at baseline and after 30 days of exposure to cleaning agents were compared using Student t-test. Mean differences in light transmittance among the cleaning agents after the 30-day period were evaluated using Analysis of Variance. Significant statistical differences were observed in light transmittance ( $p < 0.05$ ) of polypropylene dental material between baseline and after 30 days of exposure to cleaning agents. The mean difference in light transmittance ( $p < 0.001$ ) after 30 days varied significantly among the cleaning agents. 2.5% vinegar differed significantly from other cleaning agents except for 5.0% vinegar. It can be concluded that baking soda, vinegar, and Polident® Pro Retainer & Guard enhanced the translucency of polypropylene dental material by increasing its light transmittance, while the mean difference in light transmittance varies between cleaning agents.

**Keywords:** Cleaning agents, light transmittance, polypropylene, retainer

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### 173.COMPARISON BETWEEN APICAL AND OCCLUSAL BENT WIRES IN PATIENTS ON ERICH ARCH BAR: A PROSPECTIVE SPLITMOUTH RANDOMISED CLINICAL TRIAL

Ng KT, Omar M

**Introduction:** Erich arch bar is the gold standard for closed reduction of facial bone fractures. Conventionally, the ending of the wires has always been directed apically. This research delves into an alternate occlusal ending and its effects on mucosal trauma, arch bar stability and plaque. **Objective:** The study aimed to compare the incidence of mucosal trauma, arch bar stability and plaque score between apical and occlusal ending of wires. **Methodology:** This split-mouth randomized controlled trial involves 23 participants. The oral cavity is divided into left, right and randomized into apical and occlusal ending respectively. Mucosal trauma, Turesky-Gilmore-Glickman modification of Quigley Hein plaque index and arch bar stability were assessed using standardized protocols. All data were collected and analyzed using SPSS Version 27. Statistical analysis, employing the paired t-test, was conducted to identify significant differences between the two groups. The p-value was set as significant at  $p < 0.05$ . **Results:** Occlusal bent wires had significantly lower mucosal trauma and better arch bar stability compared to apical wires ( $p < 0.001$ ). There were no differences in plaque score between the two groups. **Conclusion:** Within the limitations of this study, it can be concluded that occlusal ending is better than apical ending in terms of mucosal trauma and arch bar stability.

**Keywords:** Erich arch bar, mucosal trauma

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## 174. NEWLY DISCOVERED CLOUTING INTERPLAY BETWEEN MATRIX METALLOPROTEINASES STRUCTURES AND NOVEL QUATERNARY AMMONIUM K21: COMPUTATIONAL AND IN-VIVO TESTING

Bapat RA, Mak KK, Pichika MR, Pang JC, Lin SL, Khoo SP, Daood U

**Aims and objectives:** To analyze anti-MMP mode of action of Quaternary Ammonium Silane (QAS, codenamed as k21) by binding onto specific MMP site using computational molecular simulation and Anti-Sortase A (SrtA) mode of action by binding onto specific site using computational molecular simulation. **Materials and methods:** In silico Molecular Dynamics (MD) was used to determine the interactions of K21 inside the pocket of the targeted protein (crystal structure of fibroblast collagenase-1 complexed to a diphenyl-ether sulphone based hydroxamic acid; PDB ID: 966C; Crystal structure of MMP-2 active site mutant in complex with APP-derived decapeptide inhibitor. MD simulations were accomplished with the Desmond package in Schrödinger Drug Discovery Suite. Blood samples (~ 0.5 mL) collected into K2EDTA were immediately transferred for further processing using the Litron MicroFlow® PLUS micronucleus analysis kit for mouse blood according to the manufacturer's instructions. Bacterial Reverse Mutation Test of K21 Molecule was performed to evaluate K21 and any possible metabolites for their potential to induce point mutations in amino acid-requiring strains of Escherichia coli (E. coli) (WP2 uvrA (tryptophan-deficient)). **Results:** Molecular Simulation depicted that K21 has a specific pocket binding on various MMPs and SrtA surfaces producing a classical clotting effect. K21 did not induce micronuclei, which are the result of chromosomal damage or damage to the mitotic apparatus, in the peripheral blood reticulocytes of male and female CD-1 mice when administered by oral gavage up to the maximum recommended dose of 2000 mg/kg. The test item, K21, was not mutagenic to Salmonella typhimurium (S. typhimurium) strains TA98, TA100, TA1535 and TA1537 and E. coli strain WP2 uvrA in the absence and presence of metabolic activation when tested up to the limit of cytotoxicity or solubility under the conditions of the test. **Conclusion:** K21 could serve as a potent protease inhibitor maintaining the physical and biochemical properties of dental structures.

**Keywords:** Antimicrobial, cell death, K21, MMPs, osmoregulation, proteases, QAS, S1 binding

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## 175. EFFECT OF STRONTIUM FLUORIDE ON MECHANICAL AND REMINERALIZATION PROPERTIES OF ENAMEL: AN IN-VITRO STUDY ON A MODIFIED ORTHODONTIC ADHESIVE

Saxena K, Ann CM, Azwar MA, Banavar SR, Matinlinna J, Peters OA, Daood U

**Objectives:** Evaluate the ability of strontium fluoride on bond strength and enamel integrity after incorporation within orthodontic adhesive system as a delivery vehicle. **Methods:** Experimental orthodontic adhesive system Transbond™ XT were modified with 1% Sr2+, 0.5% SrF2, 1% strontium, 0.5% Sr2+, 1% F-, 0.5% F-, and no additions were control. Mixing of formulation was monitored using Fourier transform infrared spectroscopy. Small-molecule drug-discovery suite was used to gain insights into Sr2+, F-, and SrF2 binding. Shear bond testing was performed after 6-months of ageing. Enamel blocks were cut, and STEM pictures were recorded. Specimens were indented to evaluate elastic modulus. Raman microscope was used to collect Raman spectra and inspected using a scanning electron microscope. Crystal structural analysis was performed using X-ray diffraction. Effect of material on cellular proliferation was determined. Confocal was performed to evaluate the effect of formulation on biofilms. **Results:** FTIR of modified adhesives depicted peak changes within range due to various functional groups existing within samples. TEM represented structurally optimized hexagonal unit-cell of hydroxyapatite. Mean shear bond strength is recorded highest for Transbond XT with 1% SrF2. Dead bacterial percentage appeared higher in 0.5% SrF2 and 1% F- specimens. Crystal lengths showed an increase in 0.5% and 1% SrF2 specimens. Phase contrast within TEM images showed a union of 0.5% SrF2 crystal with enamel crystal with higher elastic modulus and highly mineralized crystalline hydroxyapatite. Intensity of  $\nu_1$  PO<sub>4</sub><sup>3-</sup> and  $\nu_1$  CO<sub>3</sub><sup>2-</sup> along with carbonate - /  $\nu_1$ PO<sub>4</sub><sup>3-</sup> ratio displayed good association with strontium fluoride. The formulation showed acceptable cell biocompatibility ( $p < 0.353$ ). All specimens displayed characteristic diffraction maxima of different apatite angles within XRD. **Significance:** Experimental results suggested good biocompatibility, adequate mechanical strength, and far-ranging crystallization ability. This would provide a new strategy to overcome the two major challenges of fixed orthodontics, biofilm growth, and demineralization of enamel.

**Keywords:** Nano-indentation, remineralization, STEM, scanning electron microscopy, Strontium, laser Raman

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## 176.A NOVEL COATED SUTURE DISPLAYS ANTIMICROBIAL ACTIVITY WITHOUT COMPROMISING STRUCTURAL PROPERTIES

Daood U, Ilyas MS, Ashraf M, Akbar M, Asif A, Khan AS, Sidhu P, Sheikh Z, Davamani F, Matinlinna J, Peters OA, Yiu C

**Background:** Treated or coated sutures promise to prevent contamination of wounds. **Purpose:** The purpose of the study was to coat surgical sutures with a new quaternary ammonium silane (QAS) antimicrobial compound at two different application temperatures and then to evaluate the resulting structural, physical, mechanical, and biological properties. **Study design, setting, sample:** In vitro and in vivo studies were conducted using male albino Wistar rats approved by the Joint Ethical Committee of IMU and Postgraduate Medical Institute, Lahore. Only suture samples, coated uniformly with verified presence of the compound and of adequate length were used. Samples which were not coated uniformly and with inadequate length or damaged were excluded. **Predictor variable:** Predictor variables were sutures with and without QAS coatings and different temperatures. Sutures were coated with QAS at 0.5 and 1.0% wt/vol using the dip coating technique and sutures with and without QAS coating were tested at 25 and 40 °C temperatures. **Main outcome variable(s):** Outcome variables of structural and physico-mechanical properties of QAS-coated and non-coated sutures were measured using Fourier transform infrared spectroscopy (for structural changes), confocal laser and scanning electron (for diameter changes), and tensile strength/modulus (for mechanical testing). Biologic outcome variables were tested (bacterial viability); macrophage cultures from Wistar rats were tested (M1/M2 polarization detecting IL-6 and IL-10). Macrophage cells were analyzed with CD80+ (M1) and CD163+ (M2). Chemotaxis index was calculated as a ratio of quantitative fluorescence of cells. **Covariates:** Not applicable **Analyses:** Ordinal data among groups were compared using the Wilcoxon Mann-Whitney U test along with the comparison of histological analysis using the Wilcoxon Sign-rank test ( $P < .05$ ). **Results:** Fourier transform infrared spectroscopy peak at 1490  $\text{cm}^{-1}$  confirmed the presence of QAS on suture's surfaces with a significant increase ( $P < .05$ ) in diameter ( $0.99 \pm 0.5\text{-mm}$ ) and weight ( $0.77 \pm 0.02\text{-mg}$ ) observed for 1% QAS groups treated at 40 °C. Non-coated samples heated at 25 °C had significantly ( $P < .05$ ) less diameters ( $0.22 \pm 0.03\text{-mm}$ ) and weights ( $0.26 \pm 0.06\text{-mg}$ ). Highest tensile strength/modulus was observed for 0.5% QAS-coated samples which also had significantly higher antibacterial characteristics than other sutures ( $P < .05$ ). QAS-coated sutures significantly increased M1 and M2 markers. **Conclusion and relevance:** QAS coating conferred antibacterial action properties without compromising the physical and mechanical properties of the suture.

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## 177. IN VITRO CHARACTERISATION OF 3D PRINTABLE FILAMENTS SUBJECTED TO EDIBLE LIQUIDS: AN ANALYSIS OF FUSED DEPOSITION MODELLING FOR INTRAORAL APPLICABILITY

Jamayet NB, Barman A, Rashid F, Eusufzai SZ, Özcan M, Dudley J, Farook TH

**Purpose:** To evaluate the influence of edible liquids on the characteristic properties of 3D printable materials compared to conventionally used dental resin acrylic. **Method:** Dental polymethyl methacrylate (PMMA) specimens were fabricated from preformed molds while polylactic acid (PLA) and polyethylene terephthalate glycol (PETG) specimens were 3D printed using fused deposition modelling at 0.1 mm layer thickness. All specimen forms adhered to ISO 37:2017 and ISO 604:2002 specifications. Specimens underwent controlled immersion for 180 hr into different media (no immersion (control), oil, soda, milk, and caffeine). Changes in mass (g), plastic deformity (N/mm<sup>2</sup>), ultimate tensile stress (N), flexural deformity (N/mm<sup>2</sup>), and break force (N) were evaluated using analysis of variance. **Results:** There was an increase in mass for all specimens following immersion with significant interactions between immersion media and the materials. The materials exhibited significant differences in plastic deformity ( $F(df) = 156.632(2)$ ,  $P < 0.001$ ), ultimate tensile stress ( $F(df) = 109.521(2)$ ,  $P < 0.001$ ), and break force ( $F(df) = 319.785(2)$ ,  $P < 0.001$ ) with no significant interactions with immersion media ( $P > 0.05$ ) on both accounts. Materials showed no significant differences in flexural deformity ( $F(df) = 2.693(2)$ ,  $P = 0.074$ ) but with significant interactions ( $F(df) = 4.984(8)$ ,  $P < 0.001$ ) between acrylic and immersion media. **Conclusion:** Commercially available 3D printable PLA and PETG filaments printed at 0.1 mm thickness possess approximately half the mechanical resilience as dental PMMA with comparable flexural deformity after exposure to edible liquids.

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## 178. NOVEL GSK-3 INHIBITOR BASED UNIVERSAL DENTIN BONDING SYSTEM: A COMPREHENSIVE ANALYSIS OF DENTINAL REPAIR AND IMPROVED BOND STRENGTH

Daood U, Al-Nabulsi M, Qasim S, Sidhu P, Saxena K, Banavar SR, Nogueira LP, Seow LL, Yiu C, Matinlina J, Sheikh Z

**Abstract:** The aim of the study was to describe the formulation of a novel universal adhesive system, based on a GSK-3 (glycogen synthetase kinase-3) inhibitor (Tideglusib®), and to evaluate its bond strength and dentinal repair capability. Tideglusib® was added to Ultradent Peak Universal Dentin Bonding Agent to make experimental adhesives (0.5 %, 1 %, 2 % final concentration). They were applied to teeth which were sectioned, stored for 24 h, or 2 years then bond strengths measured. Baseline stiffness of bonded dentin beams was tested using the three-point bending test. Animal experiments were performed to provide specimens for microcomputed tomography imaging after adhesive application. Collagen matrix was evaluated using transmission electron microscopy. The cytotoxicity of the modified adhesives was determined using fibroblastic cells. Molecular modelling evaluated binding of the Tideglusib® molecule to active sites on collagen and the adhesive components. TGFβ-1/and BMP-2 in human dentin matrices were measured and interfaces were scanned using SkyScan 2211. Adhesives' stability tests were done. **Results:** RMSD (root mean square deviation) analysis indicated simulation has equilibrated with changes for globular proteins ( $p < 0.05$ ). Specimens from 0.5 %, and 1 % Tideglusib® groups displayed adhesive penetration with Micro-CT imaging and a significant increase in dentin density was seen. Specimens from the same groups showed cells with large masses of cytoplasm with focal adhesion points. Bond strength decreased significantly ( $p < 0.05$ ) with increased storage time. Gradual release ( $p < 0.05$ ) of both TGFβ-1 and BMP-2 from hTDMs with 0.5 % and 1 % Tideglusib® groups occurred and higher elastic moduli ( $p < 0.05$ ). Collagen-based amide and proline Raman bands were seen in the Tideglusib® groups. **Conclusion:** Incorporation of Tideglusib® in experimental Universal Adhesive System at 1 % improved adhesive bond strength and promoted dentinal repair. Application of Tideglusib® based adhesive conserve mechanical properties of the tooth structure and promote regenerative capability so can be expected to extend the service life of adhesive restorations in clinical situations.

**Keywords:** Dentin, Collagen, Adhesive, Tideglusib, Nano-ct, Hybrid layer

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## 179.UNRAVELLING THE PROGRAMMED INFLAMMATION AND TISSUE REPAIR BY A MULTIPOTENTIAL ANTIMICROBIAL K21 SILANE

*Daood U, Ilyas MS, Bashir S, Yousuf N, Rashid M, Kaur K, Bapat RA, Bijle MN, Pichika MR, Mak KK, Zhang S*

**Aims and objectives:** To examine if a novel antimicrobial silane K21 can alter macrophage polarisation and affect fibroblast proliferation by deciphering the molecular pathways for programmed healing using a combined in vitro and in vivo (animal) burn model. **Materials and methods:** An injectable silane-based antimicrobial aimed to modulate macrophage polarisation was manufactured. Experimental analysis included colorimetric cell migration assays on gingival fibroblasts, macrophage phagocytosis characterisation, immunofluorescence staining, triacylglycerol accumulation within macrophages by LCMS, cellular metabolic/proliferation assays, macrophage exposure quantification with morphology assessment using FE-SEM, Raman spectral analysis, RNA isolation for relative gene expression and animal study model to morphometrically and microscopically analyse partial thickness burn wound healing under QAS/K21. **Results:** M1 and M2 polarisation both appeared exaggerated under QAS/K21 treatment. The wounds treated with K21 had depicted accelerated healing as compared to control ( $P < .05$ ) in dorsal skin of rabbits. Relative gene expression results demonstrate reduced cytokine and anti-inflammatory response under the influence of K21. While M1 expression, TG accumulation, and associated characterisations demonstrate the programmed inflammatory potential of K21. **Conclusion:** The antimicrobial and reparative efficacy of K21 silane aids in programmed inflammation for enhanced tissue healing and repair.

**Keywords:** Laser Raman, macrophage, polarisation, M1, M2, cytotoxicity, burn

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## 180. EFFECT OF VARIOUS ACID SOLUTIONS AS AN AID IN REMOVING THE ORTHOMTA-BASED ROOT CANAL FILLING

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**Objectives:** The objectives of this study were to compare the effects of various acid solutions combined with ultrasonics as an aid to remove mineral trioxide aggregate (MTA)-based root canal filling and to assess their effect on the surface topography and microhardness of root canal dentin. **Materials and method:** Fifty human permanent single rooted and single canaled freshly extracted teeth were decoronated and sectioned apically to prepare the middle third of root sections of 5 mm length. The canals were prepared in a step-back manner. OrthoMTA was packed throughout the prepared canals. These root sections were incubated for one week and subsequently randomly allocated to five groups (n = 10) according to the OrthoMTA removal method: No treatment (NT); 5% glycolic acid + ultrasonics (5% GA+U); 10% glycolic acid + ultrasonics (10% GA+U); 10% citric acid + ultrasonics (10% CA+U); Distilled water + ultrasonics (DW+U). A 1 mm deep well was created within the coronal end of the set OrthoMTA. Wells were filled with each respective test solution and left for 5 min. Thereafter, further removal of OrthoMTA used a specific ultrasonic tip. Finally, the canals were flushed using 1 mL of the respective test solutions and activated with a Controlled Memory ultrasonic tip for two cycles of 20 s each followed by flushing with 1 mL of distilled water and paper point drying of the canals. Then, specimens were longitudinally split into two halves and examined under a scanning electron microscope (1000×) to assess the residual OrthoMTA and surface topography of root canal dentin. The Vickers surface microhardness of treated radicular dentin was measured using the HMV-2 microhardness tester. **Result:** Data were analysed using one-way ANOVA followed by Tukey's post hoc test. Significant differences for residual OrthoMTA were observed between (10% GA+U) with (5% GA+U), (10% CA+U), (DW+U) and (NT) (p value < 0.01). In the context of microhardness, (5% GA+U) and (10% GA+U) showed statistically significant difference compared to (NT), (10% CA+U) and (DW+U) (p value < 0.01). **Conclusion:** 10% GA+U was superior to other tested groups in removing OrthoMTA, but it substantially reduced dentin microhardness.

**Keywords:** Endodontic retreatment, OrthoMTA, citric acid, glycolic acid

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## 181. OPACIFIERS ON COLOR STABILITY OF MAXILLOFACIAL SILICONE UNDER AGING AND INDIAN WEATHERING CONDITIONS: AN IN VITRO STUDY

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**Statement of problem:** Resistance to long-term color change is a desirable property for facial prosthetic elastomers. Evidence for the color stability of maxillofacial silicones under aging and hot and humid Indian weathering conditions is lacking. **Purpose:** The purpose of this in vitro study was to evaluate the effect of adding opacifiers on the color stability of maxillofacial silicone under human aging and Indian weather conditions. **Material and methods:** A total of 93 specimen disks were obtained from the A-2186, platinum-based, room-temperature vulcanized, maxillofacial silicone elastomer by using a Ø30×6-mm stainless-steel die. The specimens were divided into 3 main groups (n=30), C (control), T (titanium dioxide), and B (barium sulfate), and 1 additional specimen (n=1) from each group was stored in a closed box and further subgrouped as outdoor weathering (COut, TOut, BOut), acidic perspiration (CAcid, TAcid, BAcid), sebum (CSebum, TSebum, BSebum) (n=10), and visual comparison (CVis, TVis, BVis) (n=1). Baseline L\*, a\*, b\* values were recorded by using a spectrophotometer and visual perception. The specimens were subjected to human and extraoral aging conditions, and the values were recorded again after 6 months. Data were analyzed statistically by using analysis of variance (ANOVA) and post hoc analysis with the Tukey post hoc test. **Results:** In group C, the mean color change for COut was  $3.69 \pm 0.49$ ; CAcid,  $3.58 \pm 0.68$ ; and CSebum,  $7.53 \pm 0.22$  ( $P < .001$ ). In group T, the mean color change for TOut was  $2.60 \pm 0.24$ ; TAcid,  $2.35 \pm 0.13$ ; and TSebum,  $4.91 \pm 0.44$  ( $P < .001$ ). In group B, BOut was  $1.59 \pm 0.28$ , BAcid was  $1.46 \pm 0.28$ , and BSebum was  $4.03 \pm 0.71$  ( $P < .001$ ). The specimens containing barium sulfate showed the maximum color stability. The least color stability was observed in all specimens exposed to sebum solution and was significantly different ( $P < .001$ ) from the outdoor weather and acidic perspiration specimens. Visually perceivable color changes were observed in specimens exposed to the sebum solution. **Conclusions:** The addition of titanium dioxide and barium sulfate as opacifiers resulted in clinically acceptable color change when exposed to outdoor weathering and acidic perspiration but not in sebum solution.

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## 182. STRESS AND STRAIN PATTERNS OF 2-IMPLANT MANDIBULAR OVERDENTURES WITH DIFFERENT POSITIONS AND ANGULATIONS OF IMPLANTS: A 3D FINITE ELEMENT ANALYSIS STUDY

Patil PG, Seow LL, Uddanwadikar R, Pau A, Ukey PD

**Statement of problem:** The 2-implant mandibular overdenture is a popular treatment for the edentulous mandible, but information on optimum implant positions and/or angulations and their stress and strain patterns is lacking. **Purpose:** The purpose of this finite element analysis study was to evaluate stress and strain distribution patterns in 2-implant mandibular overdentures with different positions and angulations of implants under unilateral and bilateral loading. **Material and methods:** A cone beam computed tomography (CBCT)-based, 3-dimensional (3D) model of the mandible and an intraoral scanning-based 3D model of the denture were developed in the Mimics software program. A 3D model of a standard-sized implant with a low-profile overdenture attachment (LOCATOR) was developed in the Solidworks software program. Two implants were inserted in the 3D model of the mandible, with implants placed at different positions, 5, 10, 15, and 20 mm from the midline, and different distal angulations, 0-5, 0-10, 0-15, 5-5, 10-10, and 15-15 degrees (at 10-mm distance), in the 3Matics software program. Unilateral and bilateral vertical loads of 100 N were applied on the first molars in the ANSYS software program to record maximum von Mises stresses and strain values. **Results:** The stresses in the implants were maximum when placed at a 20-mm distance (4.18 MPa under unilateral and 4.2 MPa under bilateral loading), while for the implants placed at 5 mm, 10 mm, and 15 mm, the indicated stresses were less than 2.46 MPa following an increasing trend with an increase in the distance. The stresses in the implants were maximum when placed at 15-15-degree angulations (0.93 under unilateral and 0.92 MPa under bilateral loading). For lower angulations, the stresses on the implants ranged from 0.05 to 0.87 MPa. No specific trend was observed in stresses and strains with 0-5-, 0-10-, and 0-15-degree angulations, but an increasing trend was observed with 5-5-, 10-10-, and 15-15-degree angulations under unilateral loading. Under bilateral loading, the stresses and strains on the implants and the mandible showed negligible variations across all 6 angulations. **Conclusions:** The most posterior position of implants (20 mm) exhibited the highest stresses and strains on the implants and the mandible under both loading conditions. Implants placed with 15-15-degree angulations exhibited the highest stresses. Stresses and strains were similar in implants with lower angulations.

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### 183. IN-VITRO EVALUATION OF THE EFFECTIVENESS OF POLYPHENOLS BASED STRAWBERRY EXTRACTS FOR DENTAL BLEACHING

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**Objective:** To formulate a dental bleaching agent with strawberry extract that has potent bleaching properties and antimicrobial efficacy. **Methods:** Enamel specimens ( $3 \times 3 \times 2$  mm<sup>3</sup>) were prepared. Quaternary Ammonium Silane (CaC<sub>2</sub> enriched) was homogenized with fresh strawberries: Group 1: supernatant strawberry (10 g) extract < Group 2: supernatant strawberry (10 g) extract + 15%HA (Hydroxyapatite) < Group 3: supernatant strawberry (10 g) extract + 15% (HA-2%K<sub>21</sub>) < Group 4: supernatant strawberry (20 g) extract only (20 g strawberries) < Group 5: supernatant strawberry (20 g) extract + 15% HA < Group 6: supernatant strawberry (20 g) extract + 15% (HA-2%K<sub>21</sub>) < Group 7: In-office Opalescence Boost 35%. Single-colony lactobacillus was examined using confocal microscopy identifying bacterial growth and inhibition in presence of bleaching agents using 300 µL aliquot of each bacterial culture. Images were analysed by illuminating with a 488 nm argon/helium laser beam. Colour difference ( $\Delta E_{00}$ ) was calculated using an Excel spreadsheet implementation of the CIEDE2000 colour difference formula and colour change measured between after staining and after bleaching. Scanning electron microscope was used to image specimens. Raman spectra were collected, and enamel slices were used for STEM/TEM analysis. HPLC was used for strawberry extract analysis. Nano-indentation was performed and X-ray photoelectron spectroscopy. Antioxidant activity was determined along with molecular simulation. hDPSCs were expanded for Alamar Blue Analysis and SEM. **Results:** Mean colour change was significantly reduced in group 1 compared to other groups ( $p < 0.05$ ). CLSM showed detrimental effects of different strawberry extracts on biofilms, especially with antimicrobial ( $p < 0.05$ ). Groups 1, 2 and 3 showed flatter/irregular surfaces with condensation of anti-microbial in group 3. In strawberry specimens, bands predominate at 960 cm<sup>-1</sup>. HPLC determined the strawberry extracts content. Molecular simulation verified interaction between calcium and polyphenol components. XPS peak-fitted high-resolution corresponding results of Ca2p<sub>3/2</sub> and Ca2p<sub>1/2</sub> for all k<sub>21</sub> groups. Combination of 10 g strawberry extract supernatant and 15% (hydroxyapatite 2%k<sub>21</sub>) improved the whiteness and provided additional antimicrobial potential. **Conclusion:** The novel strawberry extract and antimicrobial based dental formulation had immediate bleaching effect without promoting significant changes in enamel morphology.

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## 184. DEVELOPMENT OF A BIOACTIVE DENTIN ADHESIVE RESIN MODIFIED WITH MAGNESIUM-DOPED SYNTHETIC HYDROXYAPATITE CRYSTALS

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The aim is to evaluate the development of an experimental multi-mode/Universal resin-based dentin adhesive modified with synthetic Mg<sup>2+</sup> doped hydroxyapatite crystals (HAp) having self-remineralization and antibiofilm properties. HAp doped with Mg<sup>2+</sup> was prepared by the precipitation method. Experimental adhesives were subjected to degree of conversion and X-ray diffraction test for size and crystal structure. Bond strength was tested, and electron microscopy (SEM/TEM) imaging of resin-dentin interface was done along with nanoleakage, nanoindentation, confocal and Raman analyses. *S. mutans* was analysed using CLSM images against modified adhesive specimens. Nucleating abilities within the resin-dentin specimens are determined by measuring Ca<sup>2+</sup>. Alkaline phosphatase, Runx2, and Ocn transcripts are amplified using quantitative polymerase chain reaction (q-PCR). A calcium assay is performed to quantify level of mineralisation. When compared to control adhesives, the 0.5% Hap/Mg<sup>2+</sup> containing experimental dentin adhesive demonstrated improved interaction with dentin. The preservation of uniform intact hybrid layer with the absence of nanoleakage indicated dentin bond integrity with 0.5% HAP/Mg<sup>2+</sup> modified adhesive. Self-remineralization and antibiofilm potentials are supported.

**Keywords:** Carious, demineralization, dentin, hydroxyapatite, magnesium, raman, remineralization, TEM, universal adhesive

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