14th UKM DENTAL STUDENTS’ COLLOQUIUM 2016

20th – 21st April 2016

‘CULTIVATING EXCELLENCE THROUGH RESEARCH’
Abstract Book

14th UKM Dental Students’ Colloquium

20th – 21st April 2016

Faculty of Dentistry
University Kebangsaan Malaysia
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Editor:
Norziha Yahaya

Designed by:
Norziha Yahaya
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MESSAGE FROM DEAN

In the name of Allah, the Most Merciful, the Most Benevolent.

On behalf of the Colloquium Organizing Committee, I am honoured to welcome everyone to the 14th UKM Dental Students’ Colloquium. This yearly event has become an important agenda in the faculty’s calendar, showcasing final year research projects. The diversity in the topics presented brings by the plurality of interest shown by the graduates.

We are also pleased to have invited eminent speakers from the industries to share their expertise in their respective areas.

The theme for this year’s colloquium is “Cultivating Excellence Through Research”. As future dental professionals, apart from clinical experience, the final year students are also required to equip themselves with knowledge and skill from the research components of the course.

It is our hope that this colloquium be an exciting interaction platform for future dental professionals, clinicians and dental science academics to share their ideas through recent research finding as well as establishing research networks in dentistry.

I would like to extend my deepest appreciation to all the presenters, attendees as well as to our sponsors, judges and committee members for making this colloquium a successful event.

Associate Prof. Dr. Tuti Ningseh Mohd Dom
Dean, Faculty of Dentistry
Universiti Kebangsaan Malaysia
To all friends and respected guests,

On behalf of the committee members, I take great pleasure to welcome all students, lecturers, judges and guests to our 14th UKM Dental Students’ Colloquium. This annual event marks the summit of research activities carried out by the final year dental students by sharing their research findings through poster and oral presentations.

The theme for this year is ‘Cultivating Excellence Through Research’. Indeed, it is hoped that through these research undertakings, we have nurtured the passion to know and to have a sense of curiosity in a subject to drive students to enquire and discover.

Aim of these research activities was to expose students to evidence-based dentistry and to teach them to apply research to practice. This hopefully will further cultivate the spirit of problem solving and innovating towards improved patient care. My sincere thanks to all lecturers who have guided them through this journey, making them understand the process of research. Findings of the research, which showcase all the hard work put in by the students, are ready to be presented in this remarkable event.

We are fortunate that this year’s Colloquium is held with other student enrichment programmes to unlock their potentials and further prepare them to face this challenging profession. Students will be involved with activities that enhance communication and entrepreneurship skills.

Last but not least my heartiest thanks to my committee members who have worked very hard over the last few months in order to make this event a success. At the same time, I must thank the industries and traders who have been generously supporting us.

I wish all the best to all students and hope everyone will have enjoyable and fruitful sessions throughout this two-day event.

Associate Prof. Dr. Badiah Baharin
Chairperson
14th UKM Dental Students’ Colloquium
ORGANISING COMMITTEE
MEMBERS

Patron
Associate Prof. Dr. Tuti Ningseh Mohd Dom

Advisor
Associate Prof. Dr. Dalia Abdullah

Chairperson
Associate Prof. Dr. Badiah Baharin

Secretary
Dr. Nik Madiahah Nik Azis

Assistant Secretary
Puan Zulasikin Abdullah

Treasurer & Sponsorship
Dr. Murshida Marizan Nor  Puan Siti Hajar Zakaria  Puan Nurulain Hamzah

Scientific Programme
Dr. Tanti Irawati Rosli  Dr. Amy Liew Kia Cheen

Judges
Dr. Siti Salmiah Mohd Yunos  Dr. Goo Chui Ling

Registration
Dr. Farinawati Yazid  Puan Nor Aiza  Puan Marlina Hasan

Opening and Closing Ceremony
Dr. Nurulhuda Mohd  Puan Wan Normawati Wan Hassan  Puan Nor Hasbiah Abu Asan
ORGANISING COMMITTEE MEMBERS

Abstract Book
Dr. Norziha Yahaya  Dr. Azizah Ahmad Fauzi

Presents & Souvenirs
Dr. Ho Ting Khee

Moderator
Dr. Teh Lay Ann  Dr. Mohd Zulkifli Kassim

Technical Support & Audiovisual
Dr. Victor Goh  Dr. Ahmad Shuhud Irfani Zakaria  Encik Rohaizam Pisol
Encik Mohd Firdaus Zulkafli  Encik Ithnin Mansur  Encik Mohd Safuan Md Yunos

Food & Beverages
Dr. Asma Alhusna Abang Abdullah  Puan Munirah Samsudin  Puan Norazean Adam
Puan Rodiah Ahmad  Puan Adlin Airiana Abu Hashim  Puan Nur Faiza Zaharin
Puan Normaidah Khalil  Puan Rafidah Sharifuddin  Puan Noor Fadzlizan Abd Ghafar

Slot with the Industry
Dr. Alida Mahyuddin  Dr. Tew In Meei

‘Program Pembangunan Mahasiswa’
Dr. Nor Atika Md Ashar

Protocols & Publicity
Che Suhaida Abd Rahman

‘IMPAK’ Magazine
Associate Prof. Dr. Dalia Abdullah
STUDENT CREW

Ahmad Nazirul Mubin Norazman

Jowayne Choo Chin Kang

Ezzatul Raihan Pauuzzi

Loo Chu Mian

Hazel Koh Shueh Yi

Joanne Grace a/p James

Nur Syazwina Binti Marzuki
LIST OF JUDGES

Associate Prof. Dr. Rohaya Megat Abdul Wahab
Lecturer, Faculty of Dentistry, UKM

Dr. Masfueh Razali
Lecturer, Faculty of Dentistry, UKM

Prof. Suzana Shahar
Lecturer, Faculty of Health Sciences, UKM

Prof. Baharuddin Omar
Dean, Faculty of Health Sciences, UKM

Associate Prof. Dr. Zamros Yuzadi Mohd Yusof
Head of Department, Department of Dental Public Health, Faculty of Dentistry, UM

Dr. Salleh bin Zakaria
Deputy Director, Department of Dental Health Technology, Ministry of Health
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<td>Prof. Dato Dr. Mazlin Mokhtar</td>
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| 09.00 am | Slot ‘CITRA’  
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| 10.00 am | Morning Break  
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| 10.30 am | Public Speaking Competition  
Voicing the Voiceless Pitch  
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ABSTRACTS OF ORAL PRESENTATION
AIM To assess antibiotic prescription practices in the Faculty of Dentistry of UKM and adherence to prescription guideline. MATERIALS AND METHODS A retrospective review of patients’ case notes was conducted and relevant information was written into a structured proforma. These case notes were sampled from the prescription record book for prescriptions made between 1\textsuperscript{st} January 2015 to 31\textsuperscript{st} December 2015. This information was then assessed to determine if prescription practices adhere to the following guidelines: the National Antibiotic Guideline by the Ministry of Health, Malaysia (MOH) and the Scottish Dental Clinical Effectiveness Programme (SCDEP) document. RESULTS Three most commonly prescribed antibiotics were metronidazole (47.6\%), amoxicillin(38.5\%) and augmentin (14.0\%). The highest frequency of prescription was made by undergraduate dental students(33.3\%), followed by general practitioners(25.1\%), then specialist(20.9\%) and finally postgraduates(20.8\%). Study shows very few (22.1\%) prescriptions adhered to the MOH guideline while fewer (14.2\%) adhered to the SCDEP guideline. CONCLUSIONS Antibiotic prescription practices in the UKM Faculty of Dentistry do not adhere to the MOH and SCDEP guidelines used in this study. There is a need to align and ensure that clinicians prescribe antibiotics according to standard guidelines.
O-02

A Retrospective Study of Impacted Permanent Mandibular Second Molar
Balqis Zulkifle, Nur Iman Amin-Tai,
Khairil Aznan Mohamed Khan

**AIM** To study the prevalence of MM2 impaction cases and treatment received in patients attending UKM KL dental clinic from June 2011 to June 2015.

**MATERIALS AND METHODS** Ethical approval was obtained. Orthodontic records of 1148 patients of UKM KL over a period of 5 years who have undergone screening, ongoing or completed treatment were reviewed. Inclusion criteria includes patients aged >11 years old, recorded presence of impacted MM2 and radiograph or screening form. Demographic data were recorded. Radiographic assessment includes angulation and depth of impaction using Winter’s WAR lines. Treatment received, types, duration of treatment and problems associated with MM2 impaction were recorded.

**RESULTS** 24 out of 1148 orthodontic patients with impacted MM2 were identified, presenting a prevalence of 2%. The patients consist of 9 males and 14 females ranging from 13 to 25 years of age. A total of 34 impacted MM2 were analyzed with more bilateral impaction (54.5%), mesially angulated (70.6%) and present on Class II skeletal pattern (47.4%). The most common problems associated with impaction MM2 are overeruption of opposing maxillary second molar and impacted mandibular third molar. The success rate of treatments given is 88.9%.

**CONCLUSIONS** The prevalence of MM2 impaction in this study is similar to other studies. Majority of the cases are bilateral impaction with mesial angulation on class II skeletal pattern, indicating retrognathic mandible and subsequent MM2 impaction. The most common treatment given is fixed appliance and the success rate is 83%. Early diagnosis is crucial to prevent further complex treatment.
O-03

Site-directed Mutagenesis Effects on Selected HPV genes: In silico Approach
Nor Faizah Daud @ Ibrahim, Nursyuhada Aris, Suraya Hani Mohd Sinon, Leong Xin Fang, Ahmad Tarmidi Sailan

**AIM** To study the effects of mutagenesis on E2 protein, E6 and E7 oncoproteins of high and low risk human papillomavirus (HPV) types towards their protein structures and biological functions. **MATERIALS AND METHODS** This retrospective bioinformatics studies focus on the protein sequences and structure templates of both high and low risk HPV genes and were retrieved from NCBI database, BLAST and Protein Data Bank. The constructed protein structure models (SWISSMODEL) were visualized by Rasmol and DeepViewer application to calculate the Root Mean Square Deviation (RMSD) value for protein structural difference. The mutation effects on protein and oncoproteins were reviewed with recent scientific literature. **RESULTS** E2, E6 and E7 play roles in regulating viral gene replication, cell survival and modulate cell differentiation. The mutated low risk HPV11 E2 (R37K and I73L) shows impaired transcriptional activity of the protein with no changes in RMSD value while HPV16 shows reduction in gene expression rate (R37A and I73A) which are 0 to 0.01, respectively. The range RMSD value of HPV16 E6 compared protein structures is in between 0 to 0.04 on different sites of mutation but exhibit a strong dominant negative effect on p53 degradation activity. Zinc-binding domain of E7 oncoprotein is important for its nuclear localization. Mutated amino acid residues (C58A and C91A) in zinc binding domain clearly disrupted its function in high and low risk (HPV11 and HPV16) with the RMSD value 0.04 to 0.55 in range. **CONCLUSIONS** The mutation effects on selected HPV genes were relatively independent of protein structural changes.
O-04 Factors That Impede Intention to Quit Betel Quid Chewing Among Head and Neck Cancer Patients in University Kebangsaan Malaysia Medical Centre (UKMMC) Based on Betel Quid Dependence Scale (BQDS)- A Pilot Study
Raihan Nadhirah Mohd Redzuan, Nursyahirah Ahmad Radzi, Siti Salmiah Mohd Yunus, Tan Huann Lan, MF Nizam Rashdi

AIM To assess suitability of BQDS tools among head and neck cancer in UKMMC, by identifying sociodemographic factors impeding the intention to quit betel quid chewing among head and neck cancer in UKMMC. MATERIALS AND METHODS 245 head and neck cancer patients who had treatment at UKMMC OMFS department from November 2015-January 2016 were reviewed. 62.9% (N=154) answered the call and 91% (141) of them did not chew betel quid. 13 patients who met the criteria were selected and further interviewed via telephone using the BQDS. Factors ‘physical & psychological urgent needs’, ‘increasing dose’ and ‘maladaptive use’ were evaluated. RESULTS Prevalence among head and neck cancer who chewed betel quid was 8.4%. Statistical test was not available to run at 95% confidence due to lack of number in sample (n=13). BQDS has high internal consistency Cronbach’s α= 0.88 among head and neck cancer patients. Descriptive statistics showed a high total score of BQDS (Median = 7.0 IQR = 8). Malay ethnic scored the highest of BQDS (Median = 8.0, IQR = 0). Male showed a higher score (Median = 9.0, IQR = 0) than female. Low income patients scored the highest of BQDS (Median = 9.0, IQR =8). Those with primary school education had the highest score (Median = 7.0, IQR = 9). CONCLUSIONS The BQDS score showed high dependency among head and neck cancer patients, thus it can be used as a tool to access the betel quid chewing habit among head and neck cancer patients.
O-05

Index of Clinical Consequences of Untreated Dental Caries (PUFA) of Malaysian Adult Sub-population
Ang Hui Chyi, Tay Ying Xi,
Amy Liew Kia Cheen, Eason Soo, Dalia Abdullah

AIM The purpose of this study was to evaluate the diagnostic accuracy of PUFA index in assessing clinical consequences of untreated dental caries among Malaysian adult subpopulation as compared to Periapical Index (PAI) and conventional clinical diagnosis. The prevalence of caries in this group was also assessed. MATERIALS AND METHODS Based on convenient sampling, 80 Malaysian adults who attended Primary Care Clinic at Faculty of Dentistry, University Kebangsaan Malaysia, Kuala Lumpur were examined. Caries experience was evaluated according to WHO criteria (DMFT index). Clinical consequence of untreated dental caries was assessed by the presence of pulpal involvement, ulceration, fistula and abscess (PUFA) index. Periapical status of all the teeth in the orthopantomograph (OPG) was scored using Periapical Index (PAI). All teeth were diagnosed based on American Association of Endodontology periapical disease classification. RESULTS Prevalence of DMFT > 0 was 95%(n=76) with the mean index of 6.26. Prevalence of PUFA > 0 was 33.8%(n=27). Mean number of teeth affected (PUFA) was 0.55. Out of 2166 teeth assessed, 2.0%(n=45) were diagnosed with pulpal infection, 2.9 %(n=65) periapical infection while the OPG showed presence of periapical lesions in 3.4%(n=75) teeth. The sensitivity of PUFA index was moderate (0.49) but the specificity was high (0.99) when compared with the clinical diagnosis. Similar result was obtained when PUFA was compared with the PAI (sensitivity 0.39 and specificity 0.99). CONCLUSIONS The study revealed high prevalence of DMFT index with moderate PUFA index in Malaysian adult subpopulation. PUFA Index can be used to complement DMFT Index in assessing the consequences resulting from untreated dental caries. ACKNOWLEDGMENT This project is supported by Fundamental Research Grant Scheme FRGS1/2015/SKK14/UKM/02/1.
AIM To investigate the various indications for removal of impacted lower third molars in Faculty of Dentistry, Universiti Kebangsaan Malaysia (UKM) following the introduction of NICE guidelines. MATERIALS AND METHODS The data in this retrospective study were obtained from the clinical and radiographic records of 270 patients seen in the Oral and Maxillofacial Surgery Department for lower third molar surgery from 2010 until 2015. The demographic data, type of impaction, indications for removal, symptoms related to third molar and the evidence of disease were recorded and analysed. RESULTS A total of 303 mandibular third molars were surgically removed from 270 patients (131 male, 139 female) aged between 18 to 55 years. The mean age is 28.1 years old. The commonest indication for removal was recurrent pericoronitis (36.2%) followed by unrestorable caries on third molar (24.0%) and caries on distal second molar (17.5%). The most common type of impaction indicated for removal was mesio-angular (48.8%) with unrestorable caries being the most common pathology (57.4%). About 54.3% of teeth removed due to pericoronitis were from the above 25 years age group. There is a statistically significant association between presence of symptoms and evidence of disease (p<0.01). CONCLUSIONS The commonest indication for removal of third molar was pericoronitis. Although there is no association between age, race and gender with evidence of disease related to third molar, the removal of impacted third molar due to pericoronitis was higher in the older age group. However, asymptomatic third molar does not necessarily reflect absence of disease.
Patients’ Awareness on the Effects of Tobacco and the Relationship of Smoking Status and Periodontal Disease
Yeoh Siu Ming, Yeo Wan Ying, Nurulhuda Mohd, Nurul Asyikin Yahya

AIM To assess patients’ attitude and knowledge on smoking and the relationship of smoking status and severity of periodontal disease. MATERIALS AND METHODS A cross-sectional study was conducted using a self-administered questionnaire and patient’s clinical record. The questionnaire was adapted from previous studies and validated by two dental specialists. Only patients with complete information of full periodontal charting were included in the study. The severity of periodontitis for this study was divided into mild, moderate and severe categories. Data collected were analysed using SPSS version 23.0. Chi-square test and the t-test were used to detect statistical differences. RESULTS Out of 83 subjects participated in this study, 64 were non-smokers and 19 were smokers. Bad breath (n=76, 91.6%) and teeth staining (n=79, 95.2%) were the most known consequences of smoking by the subjects. The least known effect of smoking was poor wound healing (n=37, 44.6%). Most patients (n= 58, 69.9%) agreed that dentists should provide smoking cessation advice. Regardless of smoking status, most patients (n=48, 57.8%) had moderate and severe periodontitis. However, there was no significant difference (p>0.05) between severity of periodontal disease and smoking status. CONCLUSIONS Patients have positive attitude towards tobacco cessation counselling and good general knowledge on the effects of smoking on general and oral health. Therefore, dentists should advice patients on the common oral health effects of smoking in the clinic. Although studies have shown that smoking is a risk factor for periodontitis, however, in this study other factors might have influenced the possible causes of periodontitis.
Impact of Denture Essential Kit: A Randomized Controlled Trial

Lim Lay Heng, Lim Zhi Wei,
Natasya Ahmad Tarib, Nor Atika Md Ashar, Ho Ting Khee,
Marlynda Ahmad

**AIM** To introduce Denture Essential Kit (DEK) that comprises of denture cleansing tablets, denture adhesive, labelled denture and to evaluate the impact of DEK on the denture care regime among denture wearers. **MATERIALS AND METHODS** A total of 78 patients were recruited in this study (n=78). Patients were divided into two groups; first time denture wearers and previous denture wearers. Randomization was carried out with half of the patients received DEK and the other half did not. A set of questionnaire was given during delivery and review stage to assess the knowledge and habits on denture care before and after DEK respectively. **RESULTS** From 78 patients, 25 were first time denture wearers (32.1%) while 53 were previous denture wearers (67.9%). Out of 67.9%, 56.6% claimed that they have never received instructions on denture care during delivery stage. Only 48 patients completed review visit. Both groups showed significant effect on acknowledgment of receiving instructions on denture care (p<0.05). During review appointment, there was an increase from 37.9% to 50% in the use of cleansing tablet among previous denture wearers group. There is a significant relationship between the use of denture adhesive and denture cleanser following the delivery of DEK (p<0.05). **CONCLUSIONS** Denture Essential Kit issued to patients during delivery appointment positively influenced their denture care behaviour.
Comparison of Dental Aesthetic Index between Down Syndrome (DS) and Normal Subjects
Tan Zhen Wei, Cheh Jing Sean, Alizae Marny Mohamed, Murshida Marizan Nor

AIM To compare the Dental Aesthetic Index (DAI) and orthodontic treatment needs between Down Syndrome (DS) and normal subjects. MATERIALS AND METHODS This cross-sectional study involved study model of 111 DS and 111 normal subjects that fulfilled the inclusion criteria and were matched by gender and age. All study models were digitized with Rexcan CS+ scanner into 3-dimensional (3D) images. Ten occlusal characteristics of the DAI were measured on the 3D images with Geomagic software to determine the degree of malocclusion. A single score represented the dentofacial anomalies that determined the level of malocclusion severity and the need for orthodontic treatment. Data were analysed with SPSS version 23.0. RESULTS There were 58 (52.3%) male and 53 (47.7%) female in both groups. Respectively, the DS subjects reveal a significant number (p<0.05) of malocclusion compared to the normal subjects; number of missing teeth [63(56.8%); 3(2.7%)]; spacing in incisal segment [81(73.0%); 33(29.7%)]; maxillary overjet [34(30.7%); 77(69.3%)]; reverse overjet [40(36.0%); 7(6.3%)]; an antero-posterior molar relationship of half cusp [26(23.4%); 47(42.3%)] and full cusp [68(61.3%); 20(18.1%)]. The DS subjects show a significant difference (p=0. 000) of the malocclusion and treatment need compared to normal subjects for all levels of the DAI total score. Most of the DS subjects (67; 60.4%) presented with severe or very severe malocclusion, which implies a highly desirable or mandatory orthodontic treatment need (DAI ≥ 35). CONCLUSIONS DS group presented with higher percentages in the malocclusion severity. This implies higher need for orthodontic treatments among DS subjects than normal subjects.

ACKNOWLEDGMENT This project is supported by Fundamental Research Grant Scheme FRGS/1/2012/SKK11/UKM/02/3.
In vitro Antibacterial Effects of Eugenia caryophyllata (Clove) Essential Oil on Porphyromonas gingivalis and Aggregatibacter actinomycetemcomitans Grown as Single- and Mixed Species Biofilm

Siti Nurshakinah Azman, Shafina Mohd Nor, Zamirah Zainal Abidin, Shahida Mohd Said

AIM To investigate the antibacterial effects of Eugenia caryophyllata (clove) essential oil on P. gingivalis and A. actinomycetemcomitans grown as single and mixed species biofilm. MATERIALS AND METHODS The clove oil was prepared in various concentrations to determine their minimum inhibitory concentrations (MIC). Anti-adhesion activities of the clove oil were determined by co-incubation with P.gingivalis or A.actinomycetemcomitans cultures for 12, 24 and 48 hours. Biofilm disruption activities were determined by adding the clove oil into preformed mixed species P. gingivalis and A. actinomycetemcomitans biofilm. The effects on the morphology of P.gingivalis and A.actinomycetemcomitans grown as biofilm were studied using scanning electron microscopy (SEM). RESULTS The MIC of P. gingivalis were 1.3 mg/mL and for A. actinomycetemcomitans were 0.16 mg/mL. Clove oil showed anti-adhesion activities at concentrations 1.3-5 mg/mL on single species A. actinomycetemcomitans and no anti-adhesion activities on single species P. gingivalis after 12h exposure, 5mg/mL on A. actinomycetemcomitans and 0.02-5mg/mL for P. gingivalis following 24h, 0.16-1.35 mg/mL on A. actinomycetemcomitans and 0.3-2.5mg/mL for P. gingivalis following 48h exposure. No biofilm disruption activity of clove oil against mixed A. actinomycetemcomitans and P. gingivalis biofilm were observed. SEM analyses shows A. actinomycetemcomitans and P. gingivalis cell surface changes in the treated mixed species biofilm. CONCLUSIONS Clove oil may have compromised the integrity of the bacteria cell membrane. The clove oil showed better antibacterial activities against both bacteria in suspension mode compared to mixed biofilm mode.
Competency of UKM Dental Graduates from the Perspective of the Graduates and their Employers

Lok Yi Ying, Chan Lai Peng, Badiah Baharin, Dalia Abdullah, Nik Madihah

AIM: To assess the competencies of dental graduates of Faculty of Dentistry, Universiti Kebangsaan Malaysia (UKM) as perceived by the graduates and their employers, based on the core competencies listed by the five-year DDS undergraduate curriculum introduced in 2008. MATERIALS AND METHODS: A self-administered questionnaire consisting of 43 questions based on 8 domains of competencies was sent to 177 UKM dental graduates of years 2012, 2013, 2014 and 2015 as well as 33 senior dental officers of MOH who represented their employers. The domains covered aspect of skills involved in gathering information at chairside, diagnosis, treatment planning, treatment and prevention, community-based, management and administrative, communication, and personal management and professional development. RESULTS: A total of 132 out of 177 graduates (75%) and 17 out of 33 employers (52%) responded. Overall, competency rated by the graduates and employers on all domains were more than 72% and 66.2% respectively. The highest competency rated by the graduates and employers, was gathering information at chairside which were 98.8% and 100% respectively. Basic life support rated the least competency level by both groups which were 38.6% and 23.5% respectively. The employers underrated the graduates in treatment and prevention, community-based skill, management and administrative skills, and communication skill. CONCLUSIONS: The graduates showed good level of competency in majority of the domains. However the employers were reserved on treatment and prevention, community-based skill, management and administrative skills, and communication skill which may need to be addressed in order to improve the DDS undergraduate program in UKM. ACKNOWLEDGEMENT This project was supported by UKM PTS-2011-153.
The Use of External Marker in Minimizing Error When Using Bisecting Angle Technique
Muhammad Aqil Ab Aziz, Mohd Amirul Zulzamri, Azizah Ahmad Fauzi, Atika Ashar

AIM To assess the effect of external marker on the number of errors occurring during periapical radiography by dental students. MATERIALS AND METHOD Twelve sets of full mouth periapical radiographs were taken by final year dental students using simulated dental phantom head. Views were taken using the traditional bisecting angle technique – without external marker (BWM) and with the use of external marker (BM) and paralleling technique (PT). The receptor was a digital sensor. Radiographic images were evaluated and errors were classified and tabled according to the frequency and type. Chi-square test was used to compare the frequency of radiographic errors made using these three techniques. RESULTS In PT, the most common error recorded is crown cut (20.0%). This is followed by horizontally misplaced sensor (10.3%), apical cut (6.3%) and cone cut (2.5%). In bisecting angle techniques, BWM shows similar percentage in the frequency of both cone cut and crown cut errors (13.8%), while, BM recorded crown cut (10.0%) and cone cut (1.3%). Presentation of errors in BM is lesser in comparison to PT. A chi-square test was performed and no significant association was found between techniques (PT and BWM), p=0.206 and the frequency of errors=51.3%. However, the frequency of errors was significantly lesser for BM compared to BWM, p < 0.05. CONCLUSIONS The use of external marker for bisecting angle technique provides significant reduction in radiographic errors. The use of external marker is recommended for bisecting angle technique to reduce the number of radiographic errors made by dental students. ACKNOWLEDGEMENT This research is supported by Geran Penyelidik Muda GGPM-2014-049.
The Sensitivity and Specificity of Autofluorescence Imaging (Velscope) for Detection of Oral Potentially Malignant Disorders in Primary Dental Care Setting
Gary Sih Jiawei, Tan Yen Nee,
Ahmad Tarmidi Sailan, Noor Sam Ahmad, Suraya Hani Mohd Sinon

AIM To determine the sensitivity and specificity of autofluorescence (AF) imaging (VELscope) as an adjunctive diagnostic tool in detection of oral potentially malignant disorders (OPMDs) in primary dental care. MATERIALS AND METHODS 20 patients were selected and divided into two groups: test (OPMDs)(n=10) and control (normal oral mucosa-NOM)(n=10). Validated questionnaires were given to access their demographic background and habitual risk factors. Absence and presence of oral lesions were noted using conventional oral examination (COE) and verified using VELscope Vx device (LED Dental Vancouver, Canada) by looking for areas with changes of fluorescence (retained, increased or loss of fluorescence). Clinical photographs were taken for both groups following COE and VELscope Vx examination. Oral brush biopsies samples (Oral Advance Kit™) were stained with Feulgen-Thionin reagent and was sent for DNA ploidy analysis using ClearCyte™ device. Sensitivity, Specificity, Positive predictive value (PPV), Negative predictive value (NPV) and accuracy between COE and DNA ploidy, between AF imaging and DNA ploidy and between COE and AF imaging were calculated. RESULTS The sensitivity and specificity between AF imaging and DNA ploidy analysis were 11.11% and 80% whereas the PPV and NPV were 33.33% and 50% respectively. AF imaging showed no significant differences in sensitivity and specificity when compared to COE. The accuracy of AF imaging was 100%. CONCLUSION AF imaging showed high specificity but low sensitivity in detecting OPMDs and differentiating it from NOM. AF imaging has great potential as an adjunctive diagnostic tool in conjunction with COE in diagnosing OPMDs. ACKNOWLEDGEMENT This research is supported by Geran Penyelidik Muda GGPM-2013-097.
Clinical Efficiency Measured by Visit Per Operatory in Teaching Clinic at Universiti Kebangsaan Malaysia
Nor Syairah Othman, Nursyamimi Samsuddin, Jasmina Qamaruz Zaman, Yew Hsu Zenn, Safura Anita Baharin, Tuti Ningseh Mohd Dom

AIM To determine the efficiency of utilization of resources (namely dental chair) for provision of teaching and learning experience to dental trainees and care to patient.

MATERIALS AND METHODS This is a prospective research. It was conducted by collecting data regarding utilization and non-utilization of dental chairs and determining the reasons for the non-utilization. Clinicians were asked regarding the reasons why their patient failed to attend; which was verified by patient interview in the next clinical session. The data were analyzed using Microsoft Excel 2010.

RESULTS The percentage of chairs being utilized per teaching session for a period of three months in Surgery 1, Surgery 4, Surgery 5, Surgery 6 and Surgery 7 are 43%, 43%, 42%, 55% and 23% respectively. The reasons for non-usage of dental chairs during clinical sessions are due to non-functional chairs (30%), chairs are not booked (64%) and patient FTA (3%). Only one patient was booked per chair per teaching session for almost all types of treatment done during the predetermined period of time.

CONCLUSIONS The clinical efficiency in optimization of dental resources in teaching clinic at Universiti Kebangsaan Malaysia is at the level where more improvement can be made to maximize the usage of these resources.
ABSTRACTS
OF
POSTER
PRESENTATION
AIM To determine the relationship between reading strategies and comprehension performance among UKM undergraduate dental students. MATERIALS AND METHODS This study involved a sample of 20 UKM undergraduate dental students from year 2 – year 5, 10 of whom had low scores and another 10 whom had high scores in the Survey of Reading Strategies (SORS) obtained from a previous study. A multiple-choice Cloze test based on 4 scientific texts was used, whereby a number of words were omitted. Four options were given for the students to choose to fill in the blanks. The total scores and mean scores of correct answers were calculated and recorded in percentage. Data analysis was done using Microsoft Office Excel 2007.

RESULTS Among the SORS low-score participants, no students (0%) was in the ‘frustrational’ level (score=0-34%), 2 students (20%)were in the instructional level (score=35-49%) and 8 students (80%) were in the ‘independent’ level (score=50-100%). On the other hand, all students (100%) of the SORS high-score group were in the ‘independent’ level. There was significant and positive relationship between the use of reading strategies and comprehension performance from the SORS low-score students \[r= 0.907, p=0.0001\] and the SORS high-score student \[r= 0.878, p=0.0008\].

CONCLUSIONS Majority of UKM undergraduate dental students has an ‘independent’ level of reading comprehension, which indicates that these students could read the passage easily and without assistance or instructions. ACKNOWLEDGEMENT This project is supported by UKM PTS-2014-051
P-02

Comparison of Salivary pH Changes with Different Chewing Gum in High and Low Caries Risk Patients
Tey Wei Tian, Ng Jia Ying,
Farinawati Yazid, S Nagarajan MP Sockalingam

AIM To compare the salivary pH changes between low and high caries risk patients at different time intervals after consuming different types of chewing gum. MATERIALS AND METHODS This is a case-control study involved 30 patients, of which 15 of them are high caries risk patients (DMFT≥6), and the rest are low caries risk patients (DMFT≤3). Patients were instructed to brush their teeth in 2 minutes time. After two hours, baseline saliva was collected. 3 types of chewing gum were used which is xylitol, sugar based and sugar-free and types of chewing gums were assigned to patients randomly. Saliva was collected at 5th, 10th, 15th, 20th and 30th minutes and pH was measured by a calibrated pH meter. Data analysis was done using SPSS version 23. Ethical approval was obtained from UKM Research Ethics Committee. RESULTS The sample comprised of 13.3% males and 86.7% female with a mean age of 23. There is no significant difference on the salivary pH of low and high caries risk patients at baseline level. Consequently, no significant difference on salivary pH changes showed between low and high caries risk patients after consuming different types of chewing gum over 30 minutes. CONCLUSIONS There is no correlation between caries risk and salivary pH regardless the types of chewing gum used.
Screening of Unrecognised Diabetes Mellitus in Dental Patients
Heng Zi Qian, Pauline Tan Hui Li, Amy Liew Kia Cheen, Noriah Haji Yusoff

AIM  To assess the detection of unrecognized diabetes mellitus in dental patients.

MATERIALS AND METHODS  A cross-sectional study in a convenient sample of new patients was carried out in Faculty of Dentistry, Universiti Kebangsaan Malaysia. Recruited volunteers were 30 years and above, never been diagnosed with diabetes, and have any of the risk factors: family history of diabetes, hypertension, hypercholesterolemia, overweight or obese. Individuals who have been diagnosed with diabetes, pregnant or undergone active periodontal treatment within the past 6 months are excluded. Consented patients underwent structured interview and Random Finger Prick Glucose (RFPG) test.

RESULTS  A total of 43 patients were recruited, of which 24 (55.8%) were having RFPG > 5.6mmol/l. Among the risk factors stated, only overweight or obesity shows statistically significant association with increased RFPG (OR=21.3, 95% CI=2.43-186, p=0.001). Age, gender, family history of diabetes, hypertension, hypercholesterolemia, other medical conditions, smoking, periodontal disease did not show significant associations. Of all the patients who have RFPG > 5.6mmol/l, only one-third (n=8) were interested in the referral for diabetic care.

CONCLUSIONS  Dental setting have been demonstrated to be a site for opportunistic screenings of pre-diabetes and diabetes mellitus with moderate detection rate. For individuals who initially only seek dental management, the interest for medical referral for diabetic care is portrayed after simple chair-side screenings. Obesity or overweight is an important indication for RFPG test before invasive dental treatment. Further studies are required to determine the associations of other risk factors and increased RFPG.
Antibacterial Effects of Garbage Enzyme towards Enterococcus faecalis
Fazlin Nazirah Ahamad Rusly, Nashitah Redzlan, Ahmad Shuhud Irfani Zakaria, Shahida Mohd Said, Alida Mahyuddin

AIM To study the antibacterial effects and the efficacy of garbage enzyme against Enterococcus faecalis. MATERIALS AND METHODS Minimum inhibitory concentration (MIC) and anti-adhesion effect of garbage enzyme towards Enterococcus faecalis were determined after an incubation period of 24 and 48 hours respectively. The readings for both MIC and anti-adhesion effects were obtained using ELISA plate reader. The microscopic features of the bacteria following 24 hours exposure to sodium hypochlorite and garbage enzymes were observed using scanning electron microscope (SEM). The differences in MIC and anti-adhesion effect between sodium hypochlorite and garbage enzyme were determined using Mann-Whitney test. RESULTS The differences in MIC between sodium hypochlorite and garbage enzyme of different concentrations were statistically significantly different (p<0.001). Garbage enzyme was found to inhibit less bacteria than sodium hypochlorite at all concentrations. However, for anti-adhesion test, the differences between sodium hypochlorite and garbage enzyme with concentrations of 100% and 50% were not statistically significant (p>0.05). The SEM showed agglutination of Enterococcus faecalis for both sodium hypochlorite and garbage enzyme indicating its antibacterial effects. CONCLUSIONS Garbage enzyme exhibits antibacterial effects against Enterococcus faecalis but not as effective as sodium hypochlorite when compared by MIC. However, in terms of anti-adhesion effect and agglutination of bacteria, the effects exhibited by garbage enzyme is comparable to sodium hypochlorite.
P-05

Awareness of Fake Braces Usage among Y Generation
Siti Khadijah Hasan, Nor Ermamarsila Mohd Yamin,
Rohaya Megat Abdul Wahab, Khairil Aznan Mohamed Khan

AIM To investigate the level of awareness about usage of fake braces among Y generation. MATERIALS AND METHODS This project is a cross sectional-study and involving convenient sampling of 170 students with the range of 19-25 years old from UKM, Kuala Lumpur. A questionnaire was created and validated prior to collection of data about level of knowledge of students regarding the information of overall dental treatment, orthodontic treatment and fake braces. Data analysis was done by using SPSS version 23. RESULTS Majority of respondents (88% females and 12% males) are in first degree level in UKM. Most of respondents concerned about their dental health (99%) and knew all dental treatments available in dentistry such as extraction, fillings, denture construction, gum treatment, root canal treatment and orthodontic treatment but only 71% of them seek treatment when they had dental problems such as tooth ache. Sixty-one percent of respondents had heard about the fake braces from internet (66%) such as Facebook, Instagram, You Tube, reading (29%), dentist and dental clinic (3%). Only 35% of respondents knew about the dangerous side effect of wearing fake braces. Most respondents taught that fake braces are cheaper and stylist. CONCLUSIONS Respondents are well aware of dental health and dental treatment available in Malaysia. However, only minority are aware of the side effects of wearing fake braces.
Fire Scene Reconstruction: What Really Happened to the Teeth?
Izzat Zainal, Mohd Hisham Mamat, Atika Ashar, Azizah Ahmad Fauzi, Khairul Osman

Forensic identification of incinerated bodies in fire accidents can be difficult. Variations of high temperatures result in different effects on the teeth. With fire simulation, these effects on teeth can be postulated to real life situation. **AIM** To observe the effects of high temperature on teeth using fire simulation. **MATERIAL AND METHODS** Three monkeys were obtained from Jabatan Perhilitan following animal ethics approval. The monkeys were euthanized prior to exposure to fire. Each of them was then placed at three different compartments of a car; driver seat, car boot and outside the car. Fire was ignited and the temperature was recorded at 30 second intervals until it was stable. Photographs and radiographs were taken before and after fire reconstruction to simulate the antemortem and postmortem records. Changes in temperature and to the teeth were recorded through observation and measurement of dental tissues. **RESULTS** The results showed that there were colour changes on the teeth, where it changed progressively severe from posterior to anterior. Changes range from black discolouration of anterior teeth to no changes to molar teeth. Crown fractures were observed ranging from half of the crown to the entire crown length on anterior teeth and no fracture to the posterior teeth. The enamel and dentin were identifiable through radiographic examination after exposure temperature of up to 1000°C. **CONCLUSIONS** Previous studies looking at changes to the teeth were performed through laboratory analysis. Through fire scene simulation, the exact pattern of high temperature effects to teeth can be better understood.
Validity and Reliability of 3D Blue-light Scanner for Measurement of Facial Soft Tissue Parameters
Chang Wei Zhi, Lo Kaileen, Murshida Marizan Nor, Atika Ashar, Alizae Marny Mohamed

AIM To evaluate the validity and reliability of a three-dimensional (3D) blue-light scanner to measure soft tissue morphology. MATERIALS AND METHODS Thirty subjects (10 males and 20 females) were recruited and measurements of facial soft tissue parameters were performed using caliper. Subjects’ face were then scanned using Solutionix Rexcan CS scanner and images were processed using the Geomagic software. Eight facial landmarks were identified and recorded for both manual and digital measurements by two examiners. The reproducibility of landmarks at 2-week interval was assessed for one of the examiners. Intraclass correlation coefficients (ICCC) were calculated for intraexaminer reliability and interexaminer reproducibility. Pearson’s correlation was used to analyze the correlation between both measurements. RESULTS Values of ICC above 0.93 for all measurements indicated good intraexaminer repeatability and good interexaminer reproducibility. Comparisons of all measurements of facial soft tissue parameters using caliper and digital methods show no significance difference (p>0.05). All parameters showed a significant correlation coefficient between caliper and digital measurements; pronasale to labiale superius (Ls) (r = 0. 965, p <0.01), pogonion to labiale inferius (Li) (r=0.932, p <0.01), cheilion right to cheilion left (r = 0. 961, p <0.01), Ls to Li (r = 0. 934, p <0.01), crista philtetri (Cph) right to Li (r = 0.954, p <0.01) and Cph left to Li (r = 0. 964, p <0.01). CONCLUSIONS This study has shown a high significant correlation between manual and digital measurements. The blue-light scanner is valid and reliable in measuring facial soft tissue parameters.
AIM To determine the stability of non-alcohol steroid mouthwash for patients with extensive mouth ulceration. MATERIALS AND METHODS This is an experimental study to compare the stability of non-alcohol steroid mouthwash after a storage period of 4 months. This testing was conducted by storing the 60 samples of dexamethasone (n=20), dexamethasone acetate (n=20) and dexamethasone sodium phosphate (n=20) in 60-mL amber glass bottles at room temperature. Changes of the pH was measured, spectrophotometer was used to determine the absorbance of the solutions, while measurement of undissolved mass was determined using centrifuge and weighing scale. RESULTS Weight of undissolved mass between three different steroids was significantly different calculated using oneway ANOVA (p <0.005). Post hoc test (Turkey HSD) showed that dexamethasone sodium phosphate was the most soluble when compared to dexamethasone acetate (p=0.002) and dexamethasone (p=0.000). Significant difference was found for absorbance values between each groups (p=0.000) except between dexamethasone sodium phosphate and dexamethasone acetate. There was no significant difference between the initial and final pH values within all types of steroids (p>0.05). CONCLUSIONS Dexamethasone sodium phosphate was found to be the most stable steroid when compared to dexamethasone and dexamethasone acetate after a duration of 4 months storage.
AIM To assess the oral health knowledge, attitude and behaviour among older patients in Faculty of Dentistry, Universiti Kebangsaan Malaysia. MATERIALS AND METHODS This cross-sectional study involved a convenient sample of patients above 50 years old who attending UKM dental clinic. Data on sociodemographic characteristics and basic oral health knowledge, perceptions towards oral health care and respondents’ self-care practices were obtained from a structured self-administered questionnaire, were analysed using SPSS 22.0. RESULTS From 35 older adults participated in the study, majority were female (n=22; 62.9%). The mean age was 64.4 years (SD 7.3) ranging from 51 to 75 years old. More than ¾ of them had at least one systemic disease. For oral health knowledge, majority answered correctly except for question on signs of oral cancer. In relation to attitude towards oral health care, more than half agreed on the importance of the care but ¾ of them believed tooth loss occurred due to aging process. For oral health behaviour, 77.1% had practiced toothbrushing twice daily but only 2% had regularly used interdental cleaning aids. About 60% had last dental visits more than two years ago, mainly for denture construction (37.1%). CONCLUSIONS Majority of the older adults in this study had good oral health knowledge, attitude and behaviour. However, utilization of dental services among them especially for preventive visits needs to be encouraged.
Prevalence of Dentine Hypersensitivity among Patients Attending Dental Clinics at Universiti Kebangsaan Malaysia

Khaw Chyong Bih, Ho Jia Yi, Victor Goh

AIM To study the prevalence and severity of dentine hypersensitivity (DH) among dental patients at Universiti Kebangsaan Malaysia (UKM). MATERIALS AND METHODS A cross-sectional study was carried out to determine the prevalence of DH. Patient’s demographic data was collected via questionnaire. Clinical evaluation of DH included a one-second air-blast from a triple air syringe and tactile-stimulation using a pressure-controlled probe on the cervical region of the selected tooth. Severity of DH was recorded using a 100mm Visual Analogue Scale (VAS). RESULTS Thirty-two patients were evaluated for DH. Patients were categorized into those who reported DH (DH1) or did not (DH0). Twelve (37.5%) patients self-reported DH with mean air-blast VAS of 23.8 ± 29.1 mm and tactile-stimulation VAS of 17.9 ± 21.2 mm. Of the 20 patients who did not report DH, 9 (45.0%) had clinically detectable DH with mean air blast VAS of 8.5 ± 13.8mm and tactile-stimulation VAS of 3.0 ± 8.0mm. The most common impact on daily performances due to DH amongst DH1 subjects was on eating and drinking, with 6 (50.0%) DH1 subjects affected. Whether or not a subject complained of DH was positively correlated with - number of standing teeth ($r_s = 0.420$, $p = 0.019$) and mean tactile-stimulation VAS ($r_s = 0.419$, $p = 0.017$); and negatively correlated with use of desensitizing agents ($r_s = -0.415$, $p = 0.018$). CONCLUSIONS The prevalence of DH among patients attending dental clinics at UKM was 37.5%. DH mostly affected patients in terms of eating and drinking.
P-11

Effects of Over-The-Counter Tooth Whitening Products on Colour of Stained Composite Resin
Chong Sze Yin, Tan Shu Yu, Jasmina Qamaruz Zaman, Yew Hsu Zenn

AIM To study the effects of over-the-counter tooth whitening products on the colour changes of stained nanohybrid composite resin. MATERIALS AND METHODS Forty discs of 3mm thickness of Filtek™ Z250 XT Nanohybrid Composite Resin were prepared. The specimens were immersed in coffee for 4 hours daily over a 14-day test period. The specimens were then divided into five subgroups (n=8) : [Group A- Regular Toothpaste (RTP), Group B- RTP and whitening mouthwash (WMW), Group C-Whitening TP, Group D-WTP and WMW , Group E- Control]. These tooth whitening products were applied to the surfaces of specimens over 14-day period. Colour of the specimens was measured with a colorimeter (VITA Easyshade®) before staining, after staining and after whitening. The colour changes (ΔE) were calculated using CIELAB system. Data was statistically analyzed using One-way Repeated Measures ANOVA test (P ≤ 0.05) and confirmed with post-hoc test. RESULTS Immersion in coffee resulted in a clinically significant discoloration (E>3.3) for all the composite resin tested. After 14 days of using tooth whitening products, all groups showed statistically significant colour changes (P ≤ 0.001). Compared to control group, only Group C (P=0.048) and Group D (P=0.015) showed statistically significant colour changes and this was achieved only after observation for two weeks. CONCLUSIONS The use of whitening toothpaste is effective in eliminating the discolouration of the coffee-stained nanohybrid composite resin.
Effect of Carbamide Peroxide Concentration and Desensitizing Toothpaste on Post-Bleaching Sensitivity

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**AIM** To investigate the effect of carbamide peroxide concentration and desensitizing toothpaste on post-bleaching sensitivity. **MATERIALS AND METHODS** In this non-randomized control trial, 125 adult participants with good oral hygiene and caries free upper anterior teeth were separated into four groups, each group using a different combination of bleaching agents and toothpastes. Each participant was given a customized bleaching tray, toothpaste and bleaching agent. They were instructed to apply the bleaching agent (10% or 20% carbamide peroxide) at night and brush twice daily with the allocated toothpaste (8% Pro Argine or control) for 15 days. Air blast sensitivity assessment was repeated at Day 5, Day 10 and Day 15. They were instructed to record any sensitivity in the daily logbook throughout the fifteen days of home bleaching. Clinical sensitivity was analysed using two way repeated-measures ANOVA. Self-reported sensitivity was assessed with survival analysis and log rank (Mantel-Cox) test. **RESULTS** A total of 87 participants completed the clinical follow-up. There was a significant effect of time on clinical sensitivity (p<0.001), but the effects for the concentration of carbamide peroxide (p=0.42) and use of 8% Pro Argine toothpaste (p=0.127) were not significant. For self-reported sensitivity, a total number of 102 logbooks were returned. Again, the effects of carbamide peroxide concentration ($X^2=1.34$, p=0.247) and use of desensitizing toothpaste ($X^2=0.14$, p=0.713) were not apparent, even after mutually adjusting for the other factor. **CONCLUSIONS** Post-bleaching sensitivity regressed with time, but the changes were not dependent on carbamide peroxide concentration and 8% Pro Argine toothpaste used.
Referral Patterns of General Dental Practitioners (GDPs) for Oral and Maxillofacial Surgery (OMFS) Treatment in Klang Valley, Malaysia
Nursyafiqi Liana Md Isa, Rabiatul Adawiyah Muhamad @ Ghazali, Tan Huann Lan

GDPs act as the gate keeper in referring patient to the appropriate specialist at the appropriate time. **AIM** To investigate the referral patterns of General Dental Practitioners for oral and maxillofacial surgery care in Klang Valley, Malaysia.

**MATERIALS AND METHODS** 400 questionnaires were distributed via email, postage with reply envelope and site visit to the General Dental Practitioners (GDPs) in Klang Valley, Malaysia from February 1st 2016 to March 31st 2016. 105 GDPs who registered with Malaysian Dental Council replied the questionnaires. All data retrieved was analyzed with Statistical Package for Social Sciences (SPSS) version 23.0. **RESULTS** An average of 5 cases was referred by the GDPs to the OMFS specialist in a month. 40 GDPs have advance training in oral surgery. 47.6% of the GDPs have high level of confidence in performing simple dentoalveolar surgery. The main reasons for referral are the complexity of the surgical procedure (96.2%) and the need of specialist opinion (92.4%). Referral to the specialty clinic is usually influenced by the ease of access for patient (77.1%) and the type of surgery patient required (76.2%). **CONCLUSIONS** Advance training in oral surgery may influence the level of confidence of GDPs in performing an oral surgery procedures and this will reflects the GDPs effort in practicing an ethical and safe dental practice. GDPs should always refer the patients for a specialist consultation if the patient’s condition is beyond their knowledge and capacity to be cared.
AIM To compare the information retention in three different methods of oral hygiene instruction (OHI) delivery. MATERIALS AND METHODS A cross-sectional study was undertaken to a total of 30 participants (7 males and 23 females) with mean age of 22. They were divided into 3 groups (n = 10) which were verbal (received verbal oral hygiene instruction with demonstration on model), written (received information using illustration catalog) and visual (received information from the video). All groups received similar content of information in their preferred languages (Malay or English. After 5 minutes, subjects were asked to answer a questionnaire to test their information retention. Questionnaire comprised of three parts (demographic details, usage of oral health kit and retention of information. The answers from all groups were compared. Data collected was analyzed using SPSS version 22. RESULTS Most of the subjects were able to answer the questions given correctly. Comparison for each method of oral hygiene instruction given shows no significant differences on recall of information between all groups. CONCLUSIONS There is no differences in retention of information between the three methods of oral hygiene instruction which were verbal, written and visual.
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