UG-0-1

Online Learning During the COVID 19 Pandemic: Dental Students' Perspective and Impact on Academic Performance, One Institution Experience

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Introduction: COVID-19 pandemic caused all universities in Malaysia to stop face-to-face learning and practical sessions for dental students and continued with the online learning. The aim of this study was to assess International Islamic University Malaysia (IIUM) dental students' perspectives on the implementation of online learning during the COVID-19 pandemic and its impact on academic performance. **Materials and Methods:** To assess students' perspectives regarding online learning, an online questionnaire containing evaluative statements regarding handling, didactic benefit, motivation and challenges of online learning was distributed to all IIUM dental students. The impact of online learning on academic performance was assessed by comparing the students' results of Professional Exams for the years 2018/2019 (data before online learning implementation) and 2019/2020 (data after online learning implementation). The data were analyzed using SPSS version 26.0. **Results:** 249 IIUM dental students involved in answering the questionnaire. Based on the mean score range, students gave positive responses towards management and benefits of online learning. Most statements in domain motivations scored neutral. From domain challenges, students showed that they faced some difficulties during online learning. Comparison between examination results showed significant improvement in Oral Biology (Year 1), Microbiology and Pharmacology (Year 2) subjects after implementing online learning. Dental Material (Year 2) and GMGS (Year 3) subjects showed declines in mean score while other subjects showed no significant difference. **Conclusion:** Despite some challenges, students showed positive responses towards some aspects of online learning.

UG-0-2

Evaluation of Antifungal effect of *Dracaena.cinnabari* bulf.f resin methanol and water extracts on *Candida.albicans*

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OBJECTIVES: To investigate the antifungal properties of *Dracaena cinnabari* resin methanol & water extract toward *Candida albicans*. To investigate the minimal inhibitory concentration (MIC) of *Dracaena cinnabari* resin methanol & water extract on *Candida albicans*.

METHODS: Antifungal susceptibility tests on *C. albicans* was determined by disk diffusion agar using Muller-Hinton agar. The minimum inhibitory concentration (MIC) was determined by the micro-broth dilution technique. Furthermore, miconazole was used as a control.

RESULTS: Antifungal susceptibility test showed that *C. albicans* is susceptible to both *D. cinnabari* methanol and water extracts, the Zone of Inhibition were 32.2 ± 0.8 mm and 29.0 ± 1.1 mm, respectively. There was no significant difference with the miconazole control. On the other hand, the MICs ranging was from 2.50 and 5.00 mg/mL for both *D. cinnabari* methanol and water extracts.

CONCLUSION: *Dracaena cinnabari* resin extracts showed a potential antifungal effect against *Candida albicans*. This natural extract could seize a role in the treatment planning and management of *candida* disease, especially oral candidiasis.

UG-0-3

KNOWLEDGE, PERCEIVED RISK, AND PREVENTIVE BEHAVIOURS AMIDST COVID-19 PANDEMIC AMONG DENTAL STUDENTS IN MALAYSIA

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Introduction: Coronavirus disease 19 (COVID-19) is a dreadful disease that affected many sectors including dental practice in Malaysia. However, studies on dental students' knowledge, perception, and behaviours with regards to COVID-19 are very limited. Thus, this study aims to determine the knowledge status, perceived risk, and preventive behaviours of dental students in Malaysia on COVID-19. **Materials and methods:** A cross-sectional study was conducted among undergraduate dental students from 13 dental schools across Malaysia using online questionnaires. **Results:** From 355 respondents, 93.5% obtained a high score of knowledge on COVID-19. Female respondents scored higher than males in perceived risks and preventive behaviours. Chinese respondents scored highest in knowledge, while Malay respondents had the highest perceived risk score. The mean preventive behaviours score did not vary across ethnicity. On-campus students scored higher in knowledge and perceived risk whereas off-campus students practiced more preventive behaviours. Clinical students' knowledge score was higher than preclinical students. Final year students scored higher in knowledge and perceived risk compared to their juniors. **Conclusion:** Majority of dental students have good knowledge and high perceived risk of COVID-19, and they practiced most of the preventive behaviours. However, the latest information on this disease should be incorporated into dental schools' curriculums and updated periodically.

Keywords: COVID-19, dental student, knowledge, perceived risk, preventive behaviour

UG-0-4

IMPACT OF COVID-19 AMONG DENTAL STUDENTS IN MALAYSIA

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Introduction: The coronavirus disease 2019 (COVID-19) caused by a novel coronavirus (SARS-CoV-2) has gained worldwide attention and dental students' performances may indirectly be affected following the preventive measures in containing the disease. This study aims to evaluate the impact of COVID-19 pandemic on physical, mental, financial health and academic concern among dental students in Malaysia. **Methods:** The current research implemented a cross sectional study among dental students in Malaysia. Assessment of the impact of COVID-19 on dental education was done by the distribution of a set of online survey consisting of 28 questions to dental students (n=353) from public and private universities in Malaysia. The questionnaires include sociodemographic backgrounds and assessment on the mental health, financial health, physical health and academic concern. Kruskal Wallis test and Mann-Whitney U test were used to analyse the impact of COVID-19 to these 4 domains according to sociodemographic background. **Results:** A total number of 353 respondents was recorded and 76.2% comprised of female. 59.7% were clinical students and 40.3% were preclinical students. Most of students were concerned about their own emotional health, financial concern, physical wellbeing, in which Year 3 students were found to be more concerned about their mental and financial health concern. **Conclusions:** COVID-19 pandemic had indeed significantly affected Malaysian dental students mainly due to fear of the quality of online learning and the amount of clinical skills acquired. Therefore, it is important to identify dental stressors and lessen the impact of COVID-19 to dental students.

Keywords: COVID-19, pandemic, dentistry, medicine, mental health.

UG-0-5

ASCERTAINING THE VALIDITY OF MODIFIED SURVEY METHODS FOR DENTAL AGE ESTIMATIONS OF MALAYSIAN MALAY AND CHINESE JUVENILES

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BACKGROUND AND AIM: The aim of the study is to verify the suitability of dental age estimation surveys based on modified Chaillet and Demirjian's method using artificial multilayer perceptron neural network (ANN) for Malaysian Malay and Chinese juveniles aged 5.00-17.99 years.

METHODS: A total of 199 dental panoramic tomographs of Malaysian Malays and Chinese ranging in age from 5.00 to 17.99 years old were evaluated. A score chart modified from Chaillet and Demirjian's ten developmental stages was used to score the developing teeth of the lower left mandible. Dental age was converted from maturity scores calculated using Artificial neural network (ANN) (separately for Chinese and Malays) and represented as DA_S. The difference between chronological age (CA) and dental age from the maturity score (DA_S) was computed, as well as the mean and standard deviation of CA and DA_S was derived.

RESULTS: Comparison of estimated DA_S derived from modified Chaillet and Demirjian's dental maturity scores with CA showed that DA_S for Malay was significantly overestimated by 0.42 ± 0.91 years (paired t-test, $p < 0.05$) and for Chinese was marginally overestimated by 0.02 ± 0.68 years (paired t-test, $p \geq 0.05$). This shows that dental age estimation by using the modified survey of ANN does not differ significantly from CA for Malaysian Chinese but for Malaysian Malays a difference is noted.

CONCLUSION: The new dental maturity age using ANN is more accurate to be used for dental age estimation for Malaysian Chinese juveniles but must be cautiously employed for Malaysian Malays.

Keywords:

Dental age estimation

UG-0-6

The Effect of Calcium Chloride Dihydrate on the Push-Out Bond Strength of a Locally Produced Radiopaque White Portland Cement

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Objectives: To evaluate the effect of energy drinks on the flexural and optical properties of a conventional and a bulk fill composite.

Methods: One hundred specimens for flexural test and fifty specimens for optical assessment were prepared. Fifty rectangular-shaped specimens (12x2x2mm) and twenty-five disc-shaped specimens (12x2mm) of each composite [Aura Easy (AE) and Aura Bulk Fill (BF)] were prepared using customised stainless-steel moulds and for each test, specimens were divided into 5 subgroups. For flexural test (n=50), subgroup 1 (n=10) were stored in air while for optical assessment (n=25), subgroup 1 (n=5) was conditioned in distilled water for 7 days at 37°C. Subgroups 2, 3, 4 and 5 for both tests were conditioned in Red Bull, Monster, Gatorade and Extra Joss respectively, for 7-days at 37°C. After conditioning, flexural properties were measured using Universal Testing Machine (UTM), and for optical assessment, swept-source optical coherence tomography (SS-OCT) was used. Statistical analysis was performed using One-way ANOVA and independent samples t-test (α=0.05).

Results: Flexural strength and modulus values ranged from 46.96MPa to 112.77MPa; and 0.60GPa to 5.49GPa, respectively. SS-OCT assessment showed sites of increased backscattered intensity on the surface of AE after immersion in Red Bull, Gatorade and Extra Joss and BF after immersion in Monster and Extra Joss.

Conclusion: The immersion of AE and BF in energy drinks for 7-days did not have any significant effect on the flexural properties of AE and BF; surface properties of both AE and BF affected after immersion in energy drinks.

UG-0-7

Colour Stability of CAD-CAM Laminate Veneer After Ageing and Exposure to Spices

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Objective: To evaluate the colour stability of two thicknesses of feldspathic ceramic and zirconia reinforced lithium silicate (ZLS) CAD-CAM materials after artificial ageing and exposure to turmeric and paprika staining solutions.

Methods: Seventy-two CAD-CAM ceramic discs (9mmx7mm) were sectioned from feldspathic ceramic (Cerec Blocs) (n=36) and ZLS blocks (Celtra Duo) (n=36). Each type of ceramic disc was divided into two thicknesses, 0.5mm ± 0.05mm (n=18) and 0.7mm ± 0.05mm (n=18) and cemented onto human maxillary central incisors. Subsequently, the samples were subjected to accelerated ageing for 1000 cycles. Samples were further divided into three subgroups (n=6): distilled water (control), turmeric solution and paprika solution and then soaked respectively for 24 hours. Spectrophotometric colour measurement was recorded and colour difference (ΔE) was calculated between baseline and after ageing (ΔE1) and between after ageing and 24 hours immersion in spice solutions (ΔE2). Two-way ANOVA and Bonferroni's test were used in statistical analysis (α=.05).

Results: ΔE1 mean was not significantly influenced by ceramic materials (p=0.770) and thicknesses (p=0.162). Upon exposure to staining solutions, ΔE2 mean was significantly affected by interaction between thickness and staining solutions in both ceramic veneers (p<0.05). Feldspathic ceramic and ZLS presented with highest colour change after immersion in turmeric solution, while control and paprika solution were within clinical acceptable range (ΔE2 <3.3).

Conclusions: Ceramic veneers show colour changes after artificial ageing. Turmeric shows significant colour change in ceramic veneer after staining. Ceramic thickness influences the amount of colour change after ageing and staining.

UG-0-8

Discolouration potential of a locally produced fast set radiopaque white Portland cement for potential use in Endodontics

Chen Yik Zhen, Yong Ming Jun, Hoda Mohamed Abdelrazek Elnawawy, Noor Azlin Yahya, Muralithran G. Kutty , Hany Mohamed Aly Ahmed.

Objectives: White Portland Cement (WPC) is being known as a potential substitute to white mineral trioxide aggregate (WMTA) for a wide range of endodontic applications in the anterior dentition. With the aid of spectrophotometric analysis, this study assessed the discolouration potential of four groups of cements [radiopaque Malaysian WPC (RMWPC), fast-set RMWPC (FS-RMWPC), WMTA and fast-set WMTA (FS-WMTA)] when placed in the pulp chamber of maxillary central and lateral incisors.

Methods: After optimizing the normal and fast set formulations, a total of 46 extracted permanent maxillary central and lateral incisors teeth were randomly divided into five groups: WMTA, RMWPC, FS-RMWPC, FS-WMTA and control group. Samples of a thickness of 2 mm were packed with respective cement in the pulp chamber coronal to the cemento-enamel junction. Spectrophotometric analysis was performed at 1 day, 1 week, 2 weeks, 4 weeks, 6 weeks, 8 weeks and 17 weeks intervals. Repeated measures ANOVA was performed to analyse the rate of colour change (ΔE), and the level of significance was set at 0.05 (p=0.05).

Results: All groups exhibited constant increase in ΔE over time, however, RMWPC showed the least discolouration potential. FS-WMTA presented the most discolouration at 17 weeks and significant difference can be detected between all groups (p<0.05). Additionally, the ΔE in maxillary central incisors was significantly lower compared to lateral incisors (p<0.05), especially in the RMWPC group.

Conclusion: RMWPC exhibited the best colour stability while WMTA and FS-WMTA demonstrated the greatest tooth discolouration. Lateral incisors showed more discolouration compared to central incisors.

UG-0-9

Capping Agents Incorporation in Silver Diamine Fluoride

Yeoh, YS, Lee, EV, Omar, RA

Objectives: To investigate the effects of incorporation of tannic acid (TA) and sucrose (SUC) in SDF as capping agent on the staining potential and antibacterial properties of SDF. **Methods:** Bovine dentine samples ($6\times6\times2\pm0.2mm^3$) were prepared and divided into 7 groups based on different concentrations (1%, 2.5%, 5% w/v) of TA and SUC incorporated in 38%SDF: SDF (control), TA 1, TA 2.5, TA 5, SUC 1, SUC 2.5 and SUC 5. Colour change (ΔE) was measured spectrophotometrically at: application, 1, 3, 6, 24, 48, 72hrs, after 7 and 14 days.

Results: SUC- and TA-modified SDF exhibited lower ΔE than SDF at most time-intervals. Repeated measures ANOVA revealed significantly lower ΔE for SUC1 (p=0.029) beginning at day-3 and TA2.5 (p=0.020) at day-14 compared with SDF. Shifting of the FTIR peaks in TA-modified SDF at 3369cm^{-1} from the original SDF peak (3200cm^{-1}) indicates the interaction of the phenolic OH groups of TA to cap Ag$^+$ in SDF. Similarly, evidence of capping of Ag$^+$ by SUC-modified SDF was observed due to the absence of 997cm^{-1} and 1056cm^{-1} peaks, corresponding to C-O and C-C stretching in the sucrose. One-way ANOVA revealed antibacterial efficacy differs significantly among groups (p<0.001), with a decrease in TA groups as concentration of TA increased, whereas for SUC groups, it remained relatively constant regardless of SUC concentrations. **Conclusion:** The result concluded that incorporation of TA and SUC in SDF reduces staining potential of SDF, with concentration-dependent reduction of antibacterial properties in TA, but remained constant with SUC.**Keywords:** Silver Diamine Fluoride; Capping agent; Tannic acid; Sucrose; Colour change; Antimicrobial

UG-0-10

SAGITTAL ROOT POSITION AND ALVEOLAR BONE THICKNESS OF MANDIBULAR ANTERIOR TEETH: A CONE-BEAM COMPUTED TOMOGRAPHY (CBCT) STUDY.

Wan JC[1], Chin SY[2], Sulaiman E[3], Farook MS[4]

Objectives: To classify the sagittal root position (SRP) of mandibular anterior teeth in relation to bony walls of the sockets, to evaluate labial and lingual alveolar bone and to measure distance from cemento-enamel junction (CEJ) to mid-labial bone crest using CBCT.

Methods: 207 CBCT images of mandibular anterior teeth were retrospectively reviewed. SRP was classified as Class I, II, III or IV. Labial and lingual alveolar bone thickness (coronal, middle and apical thirds) and CEJ-mid-labial bone crest distance were measured. Descriptive statistics and frequency analyses were performed using SPSS software version 25.0. All the *P* values were set at 0.05.

Results: The frequency distribution of SRP showed that 67.6%, 12.1%, 6.3% and 14.0% of the 207 teeth were classified as Class I, II, III & IV, respectively. Mean labial bone thickness for all teeth were 0.28mm, 0.43mm, 1.37 mm and 3.98mm at coronal, middle third, apical and apex of root. While the mean thickness of the lingual bone wall were 1.46mm, 2.26mm, 3.14mm and 5.24mm at coronal, middle third, apical and apex of root.. The distance between CEJ and mid-labial crest for central incisors, lateral incisors and canines were 1.71mm, 1.65mm and 1.66 mm respectively.

Conclusion: Two-thirds of the CBCT data of mandibular anterior teeth were categorized into Class I SRP. The labial bone was thinner than lingual bone at every root level in sagittal view. The mean distances from CEJ to labial bone crest of all teeth were less than 2mm.

UG-0-11

Flexural Properties and Optical Assessment of Aesthetic Restorative Materials Treated with Energy Drinks

Chai HI, Saw YH, Yahya NA, Abdul Aziz A

Objectives: To evaluate the effect of energy drinks on the flexural and optical properties of a conventional and a bulk fill composite.

Methods: One hundred specimens for flexural test and fifty specimens for optical assessment were prepared. Fifty rectangular-shaped specimens (12x2x2mm) and twenty-five disc-shaped specimens (12x2mm) of each composite [Aura Easy (AE) and Aura Bulk Fill (BF)] were prepared using customised stainless-steel moulds and for each test, specimens were divided into 5 subgroups. For flexural test (n=50), subgroup 1 (n=10) were stored in air while for optical assessment (n=25), subgroup 1 (n=5) was conditioned in distilled water for 7 days at 37°C. Subgroups 2, 3, 4 and 5 for both tests were conditioned in Red Bull, Monster, Gatorade and Extra Joss respectively, for 7-days at 37°C. After conditioning, flexural properties were measured using Universal Testing Machine (UTM), and for optical assessment, swept-source optical coherence tomography (SS-OCT) was used. Statistical analysis was performed using One-way ANOVA and independent samples t-test (α=0.05).

Results: Flexural strength and modulus values ranged from 46.96MPa to 112.77MPa; and 0.60GPa to 5.49GPa, respectively. SS-OCT assessment showed sites of increased backscattered intensity on the surface of AE after immersion in Red Bull, Gatorade and Extra Joss and BF after immersion in Monster and Extra Joss.

Conclusion: The immersion of AE and BF in energy drinks for 7-days did not have any significant effect on the flexural properties of AE and BF; surface properties of both AE and BF affected after immersion in energy drinks.

Keywords: resin composite, bulk fill composite, energy drinks, flexural strength, flexural modulus, optical coherence tomography

UG-0-12

Short-Term Effects of Casein Phosphopeptide-Amorphous Calcium Phosphate and Fluoride on the Optical Reflectivity of Post-Orthodontic White Spot Lesions

Lim HH, Tee YY, Wan Hassan WN, Sukumaran P

Objectives: To evaluate the short-term effects of casein phosphopeptide-amorphous calcium phosphate (CPP-ACP) therapy and fluoridated toothpaste on the optical reflectivity of white spot lesions (WSL) during the first week of post-orthodontic debonding.

Methods: Twenty participants with WSL on the maxillary incisors were equally randomized either into CPP-ACP or control groups. The former applied CPP-ACP plus creme twice daily after brushing with fluoridated toothpaste (1100ppm) while the latter only used fluoridated toothpaste for brushing twice daily. WSL with highest degree of demineralisation was recorded with Swept-Source optical coherence tomography (OCT) at baseline (T1) and one week after baseline reading (T3). Geometry stabilizing unit and individualized jig made of polypropylene polymer sheets by vacuum forming were used to reliably locate the study area. Reliability of the OCT reading acquisitions was assessed by a second reading captured 15 minutes after the baseline reading (T2).

Results: Intraclass correlation coefficient values between T1 and T2 of more than 0.75 and non-significant paired sample t-test results supported the reliability of the method. CPP-ACP group showed significant reduction in lesion depth and severity (integrated reflectivity) up to top 250 microns. Control group showed significant reduction in lesion severity up to top 100 microns but not in lesion depth. Differences in lesion depth and severity between the groups at T3 were not significant (p>0.05).

Conclusion: Changes in optical reflectivity of WSL occured as early as one week with supplementation of CPP-ACP over fluoridated toothpaste alone showing greater tendency for improvements. This suggests remineralisation of WSL commences early post-debond.

affected after immersion in energy drinks.

Keywords: resin composite, bulk fill composite, energy drinks, flexural strength, flexural

UG-0-13

VALIDITY AND RELIABILITY OF A QUESTIONNAIRE ON PATIENT ACCEPTANCE OF ORTHODONTIC RETAINER

Low YX, Bahemia FI, Lau MN, Ashari A, Nik Mustapha NK

Objectives: To cross-culturally adapt and assess the validity and reliability of a questionnaire on patient acceptance of orthodontic retainer.

Methods: The questionnaire underwent a forward and backward translation process before being appraised by nine experienced orthodontists in terms of representativeness, relevance, clarity, and necessity for content validity. Face validity was conducted by interviewing 35 subjects followed by thematic analysis of the transcript. The questionnaire then underwent construct (exploratory factor analysis (EFA)) and criterion validity on 107 samples, and internal consistency and test-retest reliability on 34 samples. Subjects answered Retainer-modified Malaysian Oral Health Impact Profile (S-OHIP(M)) concurrently for criterion validity.

Results: Six out of ten questionnaire items with a threshold value of 0.78 for Item-Content Validity Index and Content Validity Ratio were retained and revised based on the face validity's thematic analysis findings (Fitting of Retainer, Speech, Appearance, Feeling of Mouth Cleanliness, Strength and Durability of Retainer, and Comfort). EFA proved that only one factor was defined. The questionnaire had a moderate correlation (rs = 0.416 and rs = 0.490) with S-OHIP(M) for criterion validity. It had a strong to very strong internal consistency (α = 0.687 to 0.913) and good to excellent test-retest reliability with Intraclass Correlation Coefficient ranged from 0.687 to 0.913.

Conclusions: The questionnaire on patient acceptance of orthodontic retainer has been cross-culturally adapted and found to be valid and reliable for use in the Malaysian population.

Keywords: Cross-cultural adaptation; Validity; Reliability; Orthodontic retainer; Retention;