VISION 2030
المملكة العربية السعودية
KINGDOM OF SAUDI ARABIA

كـــلـيـة طــب الأسـنـان
COLLEGE OF DENTISTRY

King Saud bin Abdulaziz University for Health Sciences

يوم المهنة والأبحاث
CAREER AND RESEARCH DAY

4th Career and Research Day Abstracts Booklet

March 22, 2021

Edited by

Dr. Maryam AlGhilan

Ms. Shahad AlHarbi

Mr. Ikram Ul Haq

DEAN'S MESSAGE

It is my pleasure to welcome you to the 4th Career and Research Day (CARD4). In this important annual event, we emphasize on the importance of research as one of the college's pillars and essential functions of education.

This booklet highlights abstracts from a wide range of research projects which will be presented by faculty, dental interns, postgraduate and undergraduate students. The 50 abstracts show the diverse research activities and outstanding efforts taking place by participants.

I would like to express my deepest appreciation to everyone who tremendously contributes to the event's success and makes it possible to come up with this excellent Booklet.

Furthermore, the abstract booklet would not have been materialized without the presence of the CARD committee. I am confident that you will continue this journey and raise our research asset.

Thank you once again for your continuous efforts and commitment.

Warm Regards,
Dr. Ali Al Ehaideb
BDS, MSc, DABP, FAAPD, FICD

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Ms. Shahad Al Harbi, Admin Assistant, COD, KSAU-HS

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Abstract Title

Abstract No. 1

Factors That Affect Saudi Population Preferences Toward Their Dentist

Suliman Al Saeed,[1,2] Noura Alghurayri,[1] Lamia Almutairy,[1] Afrah Alossimi,[1] Afnan Bin Fadhil,[1] Sadeem Abahussain,[1]

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2. King Abdullah International Medical Research Center, Riyadh, Saudi Arabia

Objectives: To explore the preference of Saudi population when selecting their dentist

Materials and Methods: Cross-sectional observational study. An online questionnaire was distributed in Arabic language. The inclusion criteria were Saudi, aged 18 years or above of both genders. The questionnaire was divided into four sections that include patient related factors, dentist related factors, dental office related factor, and table for the importance of variables.

Results: A sample size of 5317 participants completed the questionnaire with a mean age of 30.5 ± 11.6, 57% were females. Most of the participants had no preference on their dentist's nationality or gender (63% and 44%, respectively). There was a preference for dentists who are consultants (38%) and well known (83.3%) and explanatory (78.1%). Regarding the dentist attire, the scrub and lab coat was preferred for both male (41%) and female (38%) dentists. 44.8% of participants preferred the dentist to have a social media account and Twitter was the most selected one (37%). White clinic color (56%) was more preferable than other colors. The factors that were very important for the participants were dentist rank, recommended dentists, communication skills, reputation, cost of treatment, and location of the clinic.

Conclusion: Overall, the dentist related factors and clinic design play an important role in choosing a dentist. Dentists might consider these factors to improve their dental practice and their patients' experience.

Abstract No. 2

Color stability of three dimensional-printed denture resins: Effect of aging and mechanical brushing

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Objectives: To evaluate and compare the color stability of 3D- printed and conventional heat-polymerized complete denture resins following aging and mechanical brushing.

Materials and Methods: A total of forty disc-shaped specimens (10 mm in diameter and 3 mm thick) were prepared from two 3D- printed (DentaBASE (DB) and Denture 3D-+(D3D)) and one conventional polymethylmethacrylate (PMMA) denture materials (n=40). The specimens were thermo-cycled, subjected to mechanical brushing, and were later individually immersed in either coffee, lemon juice, cola, or artificial saliva (AS). The process of aging and mechanical brushing was performed to simulate one (T1) and two years (T2) of oral use. A spectrophotometer was used to record the specimens' color and the difference in color change (ΔE) were calculated using CIELAB color coordinates. Data analysis was performed using SPSS v.20. Factorial ANOVA followed by Bonferroni post-hoc test was applied (α=.05).

Results: Irrespective of the materials, treatments and time, the highest mean ΔE was observed with PMMA in lemon juice (4.58 ±1.30) and lowest mean ΔE was observed with DB in AS (0.41 ±0.18). The mean ΔE for the material groups at T1 ranged from 1.2 to 2.7 except for coffee (2.74 ±0.35), cola (3.56 ±1.06) and lemon juice (4.58 ±1.30) groups from PMMA. These groups demonstrated values above the acceptability threshold ($\Delta E = > 2.7$). However, at T2 the mean ΔE significantly decreased below the perceptibility threshold ($\Delta E = > 1.2$) except for lemon juice (2.06 ±0.47) and cola (1.88 ±0.66) from PMMA and D3D materials, respectively. These groups demonstrated values above the perceptibility threshold but below acceptability threshold. Regarding the material type, PMMA demonstrated highest mean ΔE (2.31 ± 1.37), followed by D3D (1.67±0.66), and DB (0.85 ± 0.52).

Conclusion: The color stability of 3D-printed denture resins was low compared to conventional heat polymerized PMMA. Furthermore, the color difference between the two 3D-printed resin dentures also varied significantly indicating that color stability is material dependent. 3D-printed resins can be recommended as a superior alternative to conventional PMMA resins in terms of color stability.

Abstract No. 3

The Variations of Root Canal Configuration of Permanent Dentition Among Saudi population; Systematic review

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Objectives: To critically appraise the studies that discussed the variations in root canal anatomy of permanent dentition among Saudi Arabian population. To identify the prevalence of the number of roots and canals of all the permanent dentitions among the Saudi population in all the published literature.

Materials and Methods: PRISMA guidelines have been followed in this systematic review. All studies must be for the Saudi population, human permanent teeth, and the study sample must be more than 10 teeth (Power). All literature must be free of deciduous teeth sample size, non-human teeth, non-Saudi population, case reports, case series, or review studies, anomalies. The search started in August 2020 and there were no time limits or language restrictions. The search was conducted through six different search engines: PubMed, Scopus, Web of Science, Embase, Cochrane, and Direct Science by two calibrated teams.

Results: A total of 33 relevant studies were identified. For the maxillary and mandibular anterior teeth, two roots were present in (0.52%) and (0.58%) respectively. For the maxillary first premolar, three roots were present in (1.39%) with three canals present in (2.53%). (0.36%) and (3.37%) of mandibular first premolars had three roots and three canals. The presence of a third canal in maxillary second premolars was (1.35%), while the lower was (1.06%), and reported three roots in (0.28%). The upper first molars reported the presence of four canals (50.66%). Mandibular first molars were reported to have four canals in (19.69%).

Conclusion: The knowledge of the common roots and root canal morphology is critical to ensure a successful treatment. In this systematic review, the data included was taken from different regions of Saudi Arabia, and it included the analysis of 26,665 teeth. The Saudi population findings in this research are similar to the international morphological studies. Anterior teeth showed an infrequency of any morphological changes that could happen. On the other hand, some teeth showed a variety of percentages in the number or roots and canals.

Abstract No. 4

Orthodontic Case Presentation (Cl II Malocclusion on Cl II Skeletal base Treated with Extraction and Temporary anchorage Devices)

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Objectives: To present the case with Proper diagnosis, evaluation of alternative treatment options and mechanics to be used and showing the progress and final records of the case after the treatment is finished.

Materials and Methods: The case is treated with upper first premolars extraction and TADs to retract upper anterior teeth and Utility Intrusion arch to intrude lower anterior teeth. The Case is finished with CL I Canine Relationship with good overjet and overbite.

Final Photographs and radiographs of the case were presented in the presentation.

Abstract No. 5

Emergency root canal treatment and infection control measures in endodontics during COVID-19 pandemic

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3. Vision Colleges

Objectives: To comprehend the infection control process and prevent covid-19 spread during emergency root canal treatment in the covid-19 pandemic.

Materials and Methods: Review Article

Results: A massive pressure affected the stability of the socioeconomic development and global health due to the increasing number of confirmed cases. The situation has been worse regarding the infection among healthcare workers (HCWs) who were in direct contact with the infected patients. In Italy, a situation from April 10, 2020, reported 15,314 infections among HCW, representing 11% of all infections at that time. Dentists are the workers, who are most exposed to the risk of being affected by SARS-CoV2, much more than nurses and general physicians [4]. Although SARSCoV2 is considered to be a highly transmittable disease, fortunately, there are no reported cases of transmission in a dental setting. The SARS-CoV2 outbreak is rapidly increasing and affecting more people worldwide, without any sign of resolving this outbreak in the near future. Furthermore, operative dentistry represents two third of dentistries, and the concept of "drill and fill" is still highly needed and indicated as an emergency and definitive treatment for the diseases of the pulp and periradicular tissues. To keep this fortunate news, dental professions should comply with the standard of infection control measures, besides special precautions regarding COVID-19 cross-infection.

Conclusion: The risk of aerosol transmission of diseases is an inherent part of operative dentistry, in general, and, in specific, the RCT. It is almost a procedure generating aerosol. Such risks can be greatly reduced by using various measures, including administrative, engineering, and work practice controls.

Abstract No. 6

Parental Reported Bullying among Saudi Schoolchildren: Its Forms, Effect on Academic Abilities, and Associated Sociodemographic, Physical, and Dentofacial Features

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Objectives: To determine the prevalence of bullying, its forms, and its effect on academic abilities and school attendance, as well as associated sociodemographic, physical, and dentofacial features among Saudi schoolchildren.

Materials and Methods: This cross-sectional study recruited a sample of 1131 parents of schoolchildren 8-18 years old and requested them to complete internationally accepted questionnaires for their children. Chi-squared test and logistic regression analysis were used to analyze the data ($p<0.05$).

Results: A majority (89.2%) of schoolchildren were bully victims. Physical bullying (48.9%) was the most common form of bullying. The youngest schoolchildren (8-11 years) and those who disliked school classes or neither liked nor hated them, as well as those who were truant from school, were more likely to be victims. In addition, those who had worse grades because of bullying and those who were very often bullied because of good grades or because they showed an interest in school were more likely to be victims. With regard to targeted physical features, teeth were the number one target, followed by the shape of the lips and strength, while tooth shape and color were the most common dentofacial targets, followed by anterior open bite and protruded anterior teeth. Boys and the youngest schoolchildren were more often subjected to bullying because of these features ($p<0.05$).

Conclusion: The prevalence of bullying, mainly in a physical form, was high among Saudi schoolchildren, with a negative influence on students' academic abilities. Problems related to teeth, in particular, which can be treated, were targets, mainly for boys and the youngest schoolchildren. More studies are required in Saudi Arabia to explore the issue further among schoolchildren themselves.

Abstract No. 7

Comparing Clinical Requirements for Prosthodontics among Undergraduate Saudi Dental Colleges

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Objectives: The purpose of this study is to compare clinical requirements of dental undergraduates in prosthodontics across Saudi Arabia.

Materials and Methods: This is an observational cross-sectional study. A structured survey was developed and validated by the research team. Participants who have met the selection criteria, from twenty-one dental colleges, were interviewed by calibrated researchers. The survey inquired about the type of clinics, clinical requirements, and the assessment criteria in Prosthodontics for the last two years of the undergraduate dental training. The interviews targeted the key holders of the educational process to investigate the delivered curriculum rather than the planned curriculum.

Results: Results showed significant variations in teaching methods, clinic type, and assessment methods. All Saudi dental schools insist on students performing Fixed and Removable Prosthodontics. Majority of dental colleges ensure students to perform a minimum number of cases and there is considerable variation in what that minimum number is. Seventeen dental colleges require students perform a competency exam while the others followed a different approach.

Conclusion: Despite convergence of the undergraduate curriculum being endorsed, variation still exist in the requirement and the assessment tool. The extent to which such variation in delivering the Prosthodontics training would influence the clinical skills of the undergraduate, is yet to be investigated further as it might be argued that some graduates have had more exposure to clinical cases compared to others.

Abstract No. 8

Does Single-File Systems Induce Favorable Shaping Forces?

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Objectives: Evaluate the magnitude of forces induced with single-file systems (WaveOne Gold (WOG) and Reciproc Blue (RB)) during canal shaping, and compare them with the forces that are induced with a multi-file system (ProTaper Next (PTN)).

Materials and Methods: Sixty root canals were distributed in 4 groups: WOG, RB, and PTN. The canals were shaped carefully according to the manufacturers' instructions with three insertions until reaching the working length. The forces that were induced during canal shaping in inward and upward directions were recorded. The peak forces in inward and upward directions were used for analysis using the Kruskal-Wallis and Mann-Whitney U tests. All statistical analyses were performed using SPSS software (Version 22.0; IBM, Armonk, NY) at a 5% significance level.

Results: The overall pattern of the peak loads appeared to increase as the file's distance to working length is reduced. Forces directed inward and upward ranged from 2.20 to 8.04 N and from 1.30 to 2.59 N, respectively.

PTN had the lowest inward-directed peak forces during all three insertions. Comparable upward-directed peak forces were found between the tested groups.

Conclusion: Using a single-file system would develop greater inward forces compared with that developed with using a multi-file system. The use of a multi-file system had a favorable influence on the magnitude of forces.

Abstract No. 9

Knowledge, Attitudes, and Perceptions of Dental Students Towards Artificial Intelligence in Riyadh, Saudi Arabia

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Objectives: To evaluate the attitudes and perceptions of dental students towards artificial intelligence.

Materials and Methods: A cross-sectional study was conducted using an online-based questionnaire sent to dental students in Riyadh, Saudi Arabia. The type of questionnaire used in this study was Google Forms. Furthermore, it was developed after referring a pre-validated questionnaire and distributed to dental students through social media platforms. The data collection was scheduled for a period of 3 weeks.

Results: Out of 423 participants, 50.1% had no basic knowledge about the working principle of artificial intelligence. Also, the majority was not aware of the usage of AI in dentistry (55.8% No and 44.2% Yes). The dental students were asked where they get their knowledge about AI, and social media was the most chosen answer by 40.9% (n=324). When comparing the responses of the students about whether AI applications should be part of undergraduate or postgraduate dental training, the agreement response was higher in postgraduate training (48.9% n=207) compared to the undergraduate training (40.4% n=171).

Conclusion: Despite the fact that the knowledge of AI among dental students was considered to be low, interestingly, dental students were keen and enthusiastic to learn more about new technologies related to dentistry. Also, participants believed that AI will play a vast role in dentistry. In order to improve the dental students' knowledge about AI, lectures, curricular courses, and scientific meetings should be highly considered.

Abstract No. 10

Evaluation of Radiation Exposure in Open Dental Clinics using Thermoluminescence Dosimeters (TLDs) And Questionnaires

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Objectives: The aim of this study was to evaluate radiation exposure in dental open clinics in KSAU-HS using TLDs to check if it exceeds the annual assigned exposure limit and to assess students' practices regarding radiation protection measures and their knowledge regarding the application of digital remote-control settings and TLDs.

Materials and Methods: This pilot institutional-based observational study was conducted among the clinical year students and interns at KSAU-HS College of Dentistry (COD) open clinical areas using TLDs and questionnaires. 16 Lithium fluoride (Li-F) TLD-100 were distributed evenly in the clinical areas occupied by clinical year dental students and interns for 24 working days from Sep 15th until Oct 20th, 2019. Each TLD was labeled with a serial number and fixed at the assigned clinic of each specialty. The TLDs were placed in a zigzag manner at the right corner of the selected clinic to prevent overlapping of the area coverage by each dosimeter.

Results: The mean monthly TLD readings were found to be 69.265 uSv with a higher mean value in the female clinical area (74.2975 uSv) than the male clinical area (64.234 uSv). Taking into account the 8 months of clinical exposure during the academic year, the expected annual radiation exposure would be 0.554 mSv which is significantly lower than the annual limit of radiation exposure recommended by the ICRP i.e., 1 mSv.

Conclusion: TLD readings concluded that radiation exposure was within safe limits with an estimation of 0.544 mSv per year. However, students require further education regarding protective and safety measures and the utilization of radiation equipment.

Abstract No. 11

Performance of XP Shaper and WaveOne Gold instruments after Shaping Simulated Canals at Simulated Body Temperature

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Objectives: The aims of this study were to compare the preparation times and assess the deformation of single file systems (XP Shaper (XPS) and WaveOne Gold (WOG)) after shaping simulated canals.

Materials and Methods: The XPS and WOG files were used (n=8 each) according to the manufacturers' instructions to prepare simulated resin canal blocks. After each use, the file was inspected under a microscope.

Results: The XPS and WOG systems were able to instrument the canals in 37±9.46 and 63±11.33 seconds (P < 0.05). In XPS, deformation was observed in four files; one file after the first use, one file after the fourth use and two files after the sixth use. In WOG, two files were deformed; one file after the fifth use and one file after the sixth use. One XPS file was fractured after the sixth use. The remaining 37.5% And 75% of the tested XPS and WOG were able to be used 6 times without any deformation.

Conclusion: The XPS prepared the canals faster than WOG. Both file systems showed signs of deformation after use. Less file deformation was observed in WOG after six-time usage.

Abstract No. 12

Knowledge, Attitude, Management, and Clinical Experience of Dentists Regarding Patients with Eating Disorders in Saudi Arabia.

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Objectives: The aim of this study was to assess the knowledge, attitude, management, and clinical experience of dentists regarding patients with eating disorders in Saudi Arabia.

Materials and Methods: A cross-sectional analytical study was conducted to assess and evaluate the knowledge, attitude, management, and clinical experience of dentists regarding patients with eating disorders in Saudi Arabia. Participants for this study were male and female dental practitioners working in governmental or private sector and willing to participate (n= 485). Data was collected using a self-administered structured questionnaire, which consisted of 25 items related to socio-demographics of the participating dentists, their knowledge of ED, clinical experience, attitudes, and perceived management preferences.

Results: The majority of participants were Saudi females. About 85% (422) of the participants, were aware of eating disorders (ED). More than 45% (230) of the participants rated themselves as average with regards to overall knowledge about ED. 40% (195) were not sure if they could diagnose patients with bulimia nervosa but anticipated that they could. More than half of the participants 54.8% (276) stated that they are qualified enough to provide dental care for eating disorder patients. More than 60% (323) stated that they have never treated patients with eating disorders. About 60% (288) of the professions informed patients and/or parents and referred them for consultation when they were suspected to have ED.

Conclusion: According to these findings, dentists in Saudi Arabia reported average knowledge regarding ED and insufficient clinical experience. Therefore, there is a need to increase both undergraduate and continuing education in this field. This will improve the management a dentist can provide for ED patients.

Abstract No. 13

Clinical and Radiographical Measurements of Supraeruption and Occlusal Interferences in Unopposed Posterior Teeth

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Objectives: This study compared the supraeruption of teeth from study casts (SCs) and panoramic radiographs (PRs) and its relation to tooth type, arch, facial sides, presence of occlusal interferences and type of teeth movements.

Materials and Methods: A total of 80 patients with their SCs and PRs were recruited. Supraerupted tooth types, arches, sides involved, and the presence of occlusal interferences were recorded. The SCs for supraerupted teeth were photographed, and supraeruption from PRs was recorded from the patients' files. Then the values were inputted to a software program and assessed.

Results: The highest frequency was observed among the younger age group and molars in both arches. Working side (WS) and retruded cuspal position (RCP) interferences were recorded the highest. Supraeruption values of 0.7–1.2 mm accounted for 38 (47.5%) of the total. Tilting and tipping of teeth were the most common followed by buccolingual displacement of teeth. Kappa tests showed a good intra-examiner reliability and Bland–Altman plot showed 95% confidence interval band.

Conclusion: No significant differences were observed in the supraeruption values between the types of tooth among different subgroups of SCs and PRs. Significant differences were recorded between the types and sites of teeth, with higher ratio observed in molar teeth, mandibular arch, and young age group. RCP and WS were the most recorded occlusal interferences and buccolingual displacement and tilting and tipping were the most noticeable occlusal tooth movements.

Abstract No. 14

Efficacy of Dental Panoramic Radiograph Indices in Detection of Low Bone Mass Density and Osteoporosis in Saudi Population

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Objectives: This study investigates the efficacy of dental panoramic radiograph indices in detection of low bone mass density and osteoporosis in Saudi population.

Materials and Methods: This is a retrospective review study of 67 subjects (14.9% males and 85.1% females). Data were collected via electronic systems (Best Care and Romexis) in orthopedic surgery and dental departments in King Abdulaziz Medical City (National Guard Hospital), Riyadh, Saudi Arabia. Required medical and radiographic information was obtained. Data was transferred to SPSS version 20.0 for analysis. Frequency test, One-Way ANOVA test, Pearson correlation and ROC curve were used to analyze the data.

Results: Several radiographic indices significantly correlated with T-scores such as Klemetti Index (KI), Mandibular Cortical Width (MCW), Intra-Mandibular (IM) distance and Panoramic Mandibular Index (PMI). KI was the most accurate (80.6%) and sensitive (94.6%) radiographic index in detection of reduced BMD and osteoporosis. MCW was the most specific (70%) radiographic index in excluding patients with reduced BMD or osteoporosis, and the most significant (P-value = 0.000) and strongest (r = 0.425) correlated measure with T-score.

Conclusion: Panoramic indices, especially KI and MCW, can be selectively used as an easy, fast and accessible screening tools to address patients with reduced bone density and osteoporosis.

Abstract No. 15

Does Post Space Preparation Develop Dentinal Microcrack? A MicroCT Study

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Objectives: To investigate the impact of post space preparation on dentinal microcrack development.

Materials and Methods: Forty extracted premolar teeth with single canals were prepared using ProTaper Next system (Dentsply Sirona) to X3 file, obturated, and temporized. After 3-week incubation, the teeth were received post space preparation using either ParaPost fiber post (Coltene/Whaledent) or RelyX fiber post (3M ESPE) systems. Before and after the post space preparation, the roots were micro-computed tomography imaged to detect new dentinal microcracks. The data were analyzed chi-square test at a 5% significance level.

Results: ParaPost and RelyX were able to prepare post space in 49.38±25.48 and 48.34±13.34 sec, respectively (P > 0.05). No post drill fracture or visible deformation was noticed throughout the experiment. New microcracks were found only in 15% of the ParaPost samples.

Conclusion: Within the limitations of this study, RelyX fiber post (3M ESPE) system was able to safely prepare the post space with no dentinal defect.

Abstract No. 16

Agreement Between the Clinical and Radiologic Parameters of Furcation Involvement in Patients with Periodontitis

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Objectives: The aim of the present study was to compare and assess the relationship and agreement between the clinical and radiographic detection of Furcation Involvement (FI) in the mandibular molars of patients with periodontitis.

Materials and Methods: The sample size included 360 molars from 283 participants with a total of 180 molars involved with furcation clinically and 180 without. The inclusion criteria involved records of patients in the age range 35-76 years, diagnosed with generalized periodontitis, Stage II to IV, Grade B and C, and existing periapical radiographs/dental panoramic radiographs. The periodontal charts (Hamp's classification) and radiographs were used to evaluate furcation on the buccal and lingual sites of first and second mandibular molars.

Results: Of the 360 molars, half of the molars (50%, n=180) had clinical FI. Of the clinical FI group, the majority (73%, n=131) demonstrated FI in the radiological assessment with the periapical radiographs. In the not-clinically detected FI group, just less than half (49%, n=89) demonstrated FI in the radiological assessment. The sensitivity of the radiographic detection of FI as a diagnostic marker was 50.6%, and the specificity was 72.8%. Of the 180 sites analyzed with FI clinically, a slight agreement was found between the clinical assessment and radiographic findings using the kappa analysis (k=0.18). The first mandibular molars showed a fair agreement (k= 0.21) compared to the second mandibular molars (k=0.15). In terms of the individual sites, the lingual sites (k=0.24) had a fair agreement compared to the buccal sites with a slight agreement. The Spearman Correlation analysis for the first mandibular molar showed a moderate positive correlation (r=0.4, p<0.001) compared to the second mandibular molar with no or negligible relationship (r=0.19, p<0.001). Comparatively, the DPT radiograph showed a weak correlation and poor agreement.

Conclusion: Both diagnostic tools, intraoral radiography and clinical assessment should be used for diagnosing FI in mandibular molars.

Abstract No. 17

Correlations Between Mandibular Asymmetries and Temporomandibular Disorders: A Systematic Review

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Objectives: This systematic review aims to systematically investigate the correlation between mandibular asymmetries and temporomandibular disorders.

Materials and Methods: A systematic search of the literature was conducted without time restrictions in five electronic databases (PubMed / MEDLINE, Web of Science Core Collection, Google Scholar, Scopus and Saudi digital library). The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement was followed and the clinical question in PICO format was: P (population): Patients with mandibular asymmetry

Results: The results showed that there is a consistent trend in the literature supporting the correlation between mandibular asymmetries and temporomandibular disorders.

Conclusion: Based on the included studies, orthodontic and orthognathic treatment of mandibular asymmetry could be the treatment of choice for most TMD patients.

Abstract No. 18

The Association between Skeletal Facial Types and Mandibular Third Molar Impaction: A Retrospective Study.

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Objectives: This study aims to assess the state of mandibular third molars in relation to different facial types in a Saudi population using CBCT images.

Materials and Methods: A retrospective study was performed on CBCT images. Level of lower third molars impaction were assessed. Statistical analysis performed to find relation between the impacted mandibular third molars with different skeletal facial types.

Results: 102 CBCT image of subjects were evaluated, the mean age of the sample was 34.2 years. The incidence of Mesioangular impactions has notably increased in the brachyfacial which was statistically significant.

Conclusion: Within this study's limitations, it was concluded that there is an association between the facial type and the angulation of lower third molar impactions.

Abstract No. 19

Awareness and Attitude Toward the Usage of Fake\ Fashion Braces in Saudi Arabia.

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Objectives: To evaluate the knowledge and awareness of the fake braces in Saudi Arabia population. To assess the relationship between sex, age, financial status, and education level of the participants compared to their awareness level. To evaluate the participants' perspective regarding the fake braces. To estimate the prevalence of the population in Saudi Arabia who use fake braces. To assess the reasons behind using fake braces among the participants.

Materials and Methods: A cross-sectional study was conducted through an online questionnaire in Saudi Arabia. A pilot study of 30 participants was conducted for feasibility and clarity. Participants provided their demographic information and answered designed questions related to their awareness level regarding the fake braces.

Results: The questionnaire included a total of 1230 participants. Most of the population believed that orthodontics braces should be done by an orthodontist. Upon the responses regarding how the participants knew about fake braces, (41.9%) of all answered with the "Social media". The majority tended not to wear\use fake braces and did not consider it as an alternative of orthodontic treatment. Moreover, the main reason behind wearing fake braces was for esthetic reasons.

Conclusion: High awareness levels have been shown towards the usage of fake braces among the population in Saudi Arabia. Moreover, the main reason behind wearing fake braces was for esthetic reasons. Oral hygiene, dental caries, and soft tissue ulceration were the top three side effects stated by the participants.

Abstract No. 20

Awareness and Attitude toward the usage of Fake Braces as an Intermaxillary Fixation for Diet Control purposes in Saudi Arabia.

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Objectives: 1- To assess the relationship between sex, age, financial status, and education level of the participants compared to their awareness level in using Intermaxillary Fixation (fake braces) for diet control and weight loss. 2- To estimate the prevalence of the population in Saudi Arabia who use Intermaxillary Fixation for diet controlling and weight loss according to the five main regions. 3- To evaluate the participant awareness regarding the side effects of using Intermaxillary Fixation for diet controlling and weight loss.

Materials and Methods: A cross-sectional study was conducted through an online questionnaire. The questionnaire comprised of closed ended questions in two main parts which were demographic data and fake braces in general and as an intermaxillary fixation for diet control.

Results: Out of the 1230 respondents 72 participants believe that fake braces could be used as intermaxillary fixation for diet control. Out of the 72 participants 39 of them have no idea about fake braces and 61 are not planning to wear it. Only 2 of the participants have worn fake braces for diet control in their life. The top 2 drawbacks that are considered by the participants are that it affects oral health and hygiene and cause oral ulceration with same percentage by 48.6%. and the least drawback chose by the participants was tooth resorption with a percentage of 9.72%.

Conclusion: Knowledge and awareness toward the usage of Intermaxillary Fixation (fake braces) for diet controlling in Saudi Arabia was high. Awareness regarding the side effects showed positive feedback.

Abstract No. 21

3D Facial scan; New Diagnostic tool replacing traditional dental Photography

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Objectives: Evaluating the precision and validity of the ProMax 3D face scanner in producing digital 3D facial image, compared to the traditional 2D Photography.

Materials and Methods: The study was conducted in dental college of King Saud bin Abdulaziz university for health sciences. The sample size was twelve volunteering participants. The study was conducted by two calibrated operators. Specified facial landmarks were marked, and calibrated paper was placed on the participant's face for any distortion in the image dimensions. SLR Camera was used to produce the 2D photos. Planmeca ProMax 3D ProFace was used to capture 3D photos. The scanning was repeated five times. Following that the two calibrated operators performed the measurements on both methods. Nineteen Linear measurements and two angular measurements were obtained for each image type. All the readings were captured and entered excel sheet. After that the data was exported from excel into SPSS for statistical analysis.

Results: There were no significant differences in the linear and angular measurement between the two methods, which confirmed that 3D produced images are accurate and reliable tool to capture patient facial record for Dental applications. The Captured images could be utilized for diagnostic purposes as well as record keeping. The main limitation is the 3D image scanner does not capture the full face, it only reaches the chin inferiorly and the Eyes Brows Superiorly, missing important facial fields.

Conclusion: The face scanner is a valid and reliable tool. Further studies are needed to utilize 3D superimpositions software to determine the precision of these systems.

Abstract No. 22

Artificial Intelligence Diagnostic Algorithm; Utilising convolutional neural network (CNN) to assess periodontal bone levels radiographically

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Objectives: The purpose of this investigation was to develop a computer-assisted detection system based on a deep convolutional neural network (CNN) algorithm and to evaluate the accuracy and usefulness of this system for the diagnosis and prediction of periodontally compromised teeth (PCT) in the anterior region of the dental arches.

Materials and Methods: A data set of 1724 intraoral periapical images of upper and lower anterior teeth in 1610 adult patients was retrieved from the ROMEXIS software management system at King Saud bin Abdulaziz University for Health Sciences. Using combination of pretrained deep CNN architecture and a self-trained network, the radiographic images were used to determine the optimal CNN algorithm. The diagnostic and predictive accuracy, precision, confusion matrix, recall, F1-score, Matthews Correlation Coefficient (MCC), Cohen Kappa, and receiver operating characteristic (ROC) were calculated using our deep CNN algorithm in Python.

Results: The dataset of periapical radiographs was divided randomly into 70% training, 20% testing, and 10% validation datasets. With the deep learning algorithm, the diagnostic accuracy for classifying normal versus disease was 73.0% for the images of anterior teeth and 60% for the classification of the levels of severity of bone loss. The Model showed a significant difference in the confusion matrix, accuracy, precision, recall, f1-score, MCC and Matthews Correlation Coefficient (MCC), Cohen Kappa, and receiver operating characteristic (ROC), between both binary and multi-classification model.

Conclusion: This study revealed that the deep CNN algorithm (VGG-16) was useful for evaluating the diagnosis and prediction of PCT. The results suggest that machines can perform better based on the level classification and the captured characteristics of image diagnosis. With additional optimization of the periodontal dataset, it is expected that a computer aided detection system can become an effective and efficient procedure for predicting and diagnosing PCT.

Abstract No. 23

Accuracy, Precision and Efficiency of 3D Dental Lab Scanners; a Comparative Study of Two Systems

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Objectives: To Compare the two techniques of analysis and measuring (digital and the traditional method) regarding their accuracy, repeatability, reproducibility, and time efficiency.

Materials and Methods: Pair of dental casts were duplicated. Following that the total of twenty models were scanned in each scanner (Sirona and KaVo) separately by three different calibrated operators. Measurements were repeated with an interval of 48 hours to assess inter and intra operator variation. Measurements were obtained manually and digitally.

Results: The coefficient of variations was between 1%- 8 %, although statistically significant in some groups, but clinically the differences were insignificant and within the accepted range. The reliability of the increased distance of the measurement seems more consistent. The variations of Correlations among operators increased as the distance measured decreased. Both scanners proved to be accurate with no clinically significant differences detected between the groups.

Conclusion: These two scanners were reliable tools to scan and reproduce digital dental records. One system seemed to be more efficient time-wise than the other.

Abstract No. 24

Dentin bond integrity of ZnO infiltrated Resin Adhesive A SEM, EDX, Rheology and Shear bond strength study

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Objectives: The objective of the study was to synthesize and assess Zinc Oxide (ZnO) particle infiltrated dentin resin adhesive. To assess the bond strength, characteristics of adhesive, viscosity and Dentin interaction of Zn infiltrated resin adhesive.

Materials and Methods: Zn Nanoparticles were acquired and incorporated in a standard dentin resin adhesive based on Bis-GMA and TEGDMA. The nano particles were assessed using SEM and EDX. 0%, 5% and 10% Zn Nanoparticles were incorporated to produce 3 study groups Zn-EA-0%, Zn-EA-5% and Zn-EA-10%. Adhesive viscosity was assessed using a rheometer in oscillation. Bonded teeth specimens were prepared to investigate shear bond strength (SBS) using a universal testing machine at a cross head speed of 1mm/min. Qualitative assessment of dentin interaction with the Zn infiltrated adhesive was performed using SEM for formation of hybrid layer and resin tags. Quantitative data was analysed using ANOVA and multiple comparisons test.

Results: ZnO particles were spherical shaped (SEM) and EDX showed increased Zn concentration in Zn-EA-10% than Zn EA-5% group. SEM assessment of bonded specimens showed standard and acceptable Hybrid layer and resin tab formation in Zn-EA-10%, Zn-EA-5% and Zn-EA-0% specimens. Rheological assessment revealed decreased complex viscosity with increased angular frequency. Complex viscosity among Zn-EA-10% was lower than Zn-EA-5%; and Zn-EA-0% showed highest viscosity among the groups. The SBS test revealed highest mean values for control groups (Zn-EA-0%) (23.55±3.46 MPa) followed by Zi-EA-5% (22.05 ±2.41) and Zn-EA-10% (21.7 ± 2.61) respectively. SBS among the study groups were statistically comparable.

Conclusion: The addition of Zn particles at 5% and 10% in dentin adhesive lowered the viscosity of the control resin adhesive. Zn-EA-5% and Zn-EA-10% showed comparable SBS values compared to control resin adhesive (Zn-EA 0%). Zn particle incorporation in adhesive showed suitable interaction and standard hybrid layer and resin tag formation.

Abstract No. 25

Emotional Intelligence and Stress Coping Mechanisms among Dental Students in Riyadh

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Objectives: To correlate the level of emotional intelligence to stress coping strategies among clinical year dental students in Riyadh. The study objectives were to evaluate the level of emotional intelligence (EI) and perceived stress (PSS), identify the different stress coping strategies preferred among the dental students, correlate the coping strategies to the EI factors and PSS independently, correlate PSS with EI factors, and to evaluate differences in the level of EI, PSS and coping strategies among male and female dental students.

Materials and Methods: The present study is a cross-sectional study that was conducted among senior dental students, in clinical years, studying in six different universities across Riyadh, Saudi Arabia. The questionnaire was divided into four sections, which are the demographic data of the participants, Emotional intelligence scale (BEIS-10), Perceived stress scale (PSS-10), and Brief COPE scale, which shows the stress coping strategies.

Results: A total of 291 Responses were received from male and female dental undergraduate students. The analysis showed that the Students who were not able to regulate their own emotions were more likely to have a higher level of perceived stress. In regard of students who were better at regulating others' emotions, this study manifested that they use planning for stress coping. Finally, the study who could utilize their own emotions use positive reframing, planning and religion as their mechanism of coping.

Conclusion: There was a major difference between males and females in regard of perceived stress and a minor difference in the emotional intelligence. There is significant correlation between stress coping strategies with stress level and emotional intelligence, it was also found that students rely on certain coping modalities more than other types to overcome stress.

Abstract No. 26

Dimensions of the Temporomandibular joint spaces among TMD patients: MRI based study

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Objectives: 1. To measure the dimensional changes of the internal joint spaces (Anterior, central and posterior) among TMD patients. 2. To detect the disc thickness among patients with TMD.

Materials and Methods: A retrospective study: MRI based study. Data collected from king Faisal Specialist Hospital in Riyadh Saudi Arabia. The cases will be collected and examined by researchers under the supervision of a maxillofacial radiologist. TMJ will be evaluated from different views to assess temporomandibular joint space changes under the supervision of a board certified OMF radiologist we will evaluate the DICOM files of each scan using RadiAnt DICOM viewer version 4.5.9 (Medixant, Poznan, Poland)

Results: We found that the central joint space values were higher than the anterior joint spaces and posterior joint space in both coronal and sagittal view. We also found that joint spaces among males' patients is higher than females joint, yet the number of TMD female patient was more than the number male TMD patients where it is 52 females and 24 males. For the age group, patient who are 55 years old and above have had wider joint space than patients who are less than 25 years old.

Conclusion: The central joint space value is the highest among the other joint spaces, and the values of joint spaces among males is more than the joint space of females. Elderly TMD patient has higher value of joint spaces than young patients.

Abstract No. 27

Prevalence and Characteristics of Mandibular Divergence in Class III Orthodontic Patients

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Objectives: To investigate the prevalence and characteristics of mandibular divergence in Class III orthodontic patient.

Materials and Methods: A 140 lateral cephalometric radiographs of Class III patients were collected from Riyadh Elm University. Patients with Class I Class II malocclusions, participants with craniofacial disorders or abnormalities, previous orthodontic treatment, or radiographs with patient positioning errors were excluded. Radiographs were traced by WebCepho software and measured for 16 linear and angular measurements to determine anteroposterior, vertical and dental relationships. SNA, SNB, ANB, and Wits appraisal used to determine the anteroposterior relationship. Class III status was determined by using (ANB < 1) and (Wits appraisal < -2.5). The vertical divergence pattern was considered according to FMA (22+-28.) and SN-GOMe (27+-36+). According to upper incisor to maxillary plane (U1-M) and lower incisor to mandibular plane (IMPA), the dental relationship was considered. Statistical analysis was done via SPSS software (Version21., IBM, USA).

Results: Class III status was measured using both ANB and Wits appraisal with a significant correlation between them at 0.650 (p< 0.001). Divergency was calculated using FMA and SNGOME with a stronger positive correlation at 0.887. A significant higher prevalence of hyperdivergents (FMA 46.47. and SNGOMe 56/) over hypo- and normo- divergents A negative correlation was found between mandible divergency and upper and lower incisor inclination. Hyperdivergent subjects were also noticed to have more inclined occlusal planes according to both occlusal plane can't and SN-OccPl. There were significant differences found when considering the mandible's gonial angle between all three divergent patterns when considering the FMA.

Conclusion: Precautions need to be taken when treating Class III patients as the prevalence of hyperdivergency may be higher than previously expected. Also, treatment modalities that increase the mandibular plane angle should be used with caution in Class III patients due to the higher chance of hyperdivergency.

Abstract No. 28

Evaluation of Cone Beam Computed Tomography Accuracy in Determining the Level of the Collapse of the Upper Airway in OSA Patients

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Objectives: This study aimed to analyze CBCT findings that can aid in diagnosing, evaluating and leveling upper airway obstruction in Obstructive sleep apnea (OSA) patients.

Materials and Methods: This study consists of 30 patients who were diagnosed with OSA and indicated for surgery. Drug-Induced Sleep Endoscopy (DISE) was performed preoperatively to detect the level of collapse which was assessed by LwPTL classification. Pre-surgical radiographic evaluation by CBCT with quick scan plus imaging protocol of iCAT FLX V17-Series CBCT machine. Patients were scanned twice; once at the end of inspiration and the other at the end of expiration. The level of the collapse was determined in both exposures by the aid of orthogonal planes and virtual endoscopy and compared with DISE leveling. A post-surgical evaluation was performed after 6 months of the surgery to evaluate the success of the surgical procedure.

Results: No significant difference between the levels of collapse determined from DISE and CBCT findings except for the end of expiration views at the level of the palate and lateral wall. However, the end of expiration views showed a significant difference over DISE at the level of the palate and lateral wall.

Conclusion: Static virtual endoscopy can determine the level of collapse accurately, in contrast to dynamic DISE. CBCT is considered an impressive imaging modality in OSA patients with tongue/palate interaction or lengthy palate especially at end of expiration views.

Abstract No. 29

Comparing Clinical Requirements for Endodontics and Restorative Dentistry among Undergraduate Saudi Dental Colleges

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Objectives: The aim of this study is to compare undergraduate clinical requirement among Saudi undergraduate dental students in Endodontics and Restorative clinical specialties.

Materials and Methods: This is a cross sectional study utilizing self-developed survey tool. The Tool compromised of set of questions that were developed and validated to be discussed through structural interviews. The interviews were carried and recorded via zoom app. The students, from the 20 dental schools, who participated in the interviews matched the inclusion criteria. The focus of the interviews was about clinical requirements, clinical exams, student to staff ratio, clinical hours, and clinical rotations of the last two years in Endodontics and Restorative specialties.

Results: There were significant differences between the clinical requirements of both specialties. The most required class of restorations in Saudi dental schools according to G.V. Black caries classification was class II by 34%. In restorative section the number of clinical exams were between one and two exams in most schools. For endodontics, majority of schools required at least one molar tooth to be treated with non-surgical RCT. The total number of required canals ranged between 10 to 49 canals. Moreover, 6 out of 20 dental schools required root canal retreatment. Only one dental school required two clinical rotations in endodontics clinics as part of the curriculum.

Conclusion: Significance differences exist in the clinical curriculum for both endodontics and restorative specialties in the clinical stage which may cast it shadow on the level of newly graduate dentist, more investigations are needed to assist the impact of that Saudi undergraduates' future performance.

Abstract No. 30

Influence of psychological stress on the intensity of generated maximum voluntary bite force – An observational study

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Objectives: This study aims to examine the influence of psychological stress on the amount of maximum voluntary bite force generated in an individual. Specific objectives:

1. To determine the stress levels of saudi population in riyadh
2. To measure the maximum voluntary bite force of saudi population in riyadh
3. To compare the bite force among different categories {low, medium, high} of stress levels

Materials and Methods: 111 patients aged from 20 to 45 years' old who is presented to KSAU-HS COD clinics will be examined. The patient will fill a stress questionnaire their stress scores will be calculated. These patients will be further divided into sub-groups gender wise. Following this, each of these patient's bite force measurement will be recorded using a portable customized bite recording FlexiForce sensor by an economical load and force measurement system (ELF) software. Highest value of the maximal voluntary bite force (MVBF) will be recorded and will be statistically analyzed.

Results: Preliminary data was 22 patients, 9 females and 13 males. Kruskal-Wallis test indicated no significant difference in median value of maximum voluntary bite force among different stress categories (p=0.592 for All subjects; p=0.580 for females; p=0.895 for males). Moreover, Mann Whitney test indicated no significant difference in median value of maximum voluntary bite force (p=0.688) by gender. However, the perceived stress score differed significantly between males and females (p=0.019); women experienced significantly higher stress scores.

Conclusion: The preliminary results indicate no significant difference in maximum voluntary bite force among different stress categories. Furthermore, women experienced significantly higher stress scores than men.

Abstract No. 31

Sleep-disordered breathing among Saudi children seeking orthodontic treatment

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Objectives: This research is to assess the prevalence of sleep disordered breathing (SDB) and evaluate the risks and symptoms in children seeking orthodontic treatment in a Saudi dental center

Materials and Methods: Pediatric sleep questionnaire (PSQ) was used to survey 285 children and adolescents aged 5 to 18 years' old who are undergoing orthodontic screening in a Saudi Dental Center

Results: In this study 136 (47.7%) of the participants were deemed to be high risk for developing SDB and 149 (52.3%) were low risk, males were significantly at higher risk compared to females ($P \leq 0.05$). Participants with previous adenoidectomy surgery were more likely to be identified as high-risk for SDB (P-value = 0.000) as well as participants with a family history of snoring (P-value = 0.000).

Conclusion: Sleep disordered breathing was prevalent among Saudi children seeking orthodontic therapy, it is important to screen children and adolescents in dental pediatric and orthodontic clinics for SDB risk as this is a prevalent disorder among this population, early detection of SDB will improve patients' quality of life and prevent future complications associated to this disorder.

Abstract No. 32

Self-assessment of anterior teeth discoloration among smokers of; electronic cigarettes, traditional cigarettes and hookah in Saudi Arabia.

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Objectives: Aim of the Study: To measure the discoloration on the anterior teeth caused by smoking among Saudi population by using self-reporting survey.
Specific Objectives:
To analyze the amount of staining among the E-cigarettes, traditional cigarettes, shisha smokers and non-smokers.
To analyze the severity of staining among the E-cigarettes, traditional cigarettes, shisha smokers and non-smokers.
Secondary Objectives:
To investigate the smoking patterns in Saudi Arabia.
To evaluate the awareness of smoking effects on general health.

Materials and Methods: The study will be conducted using an online survey platform which contains several pictures of various stains that will help participants to determine which picture will closely resemble their own staining. It will be guided self-reporting due to the COVID-19 situation. Questionnaires are going to be prepared to have the following sections: 1- Sociodemographic data: including age, gender and education level. Oral hygiene practices: including frequency of tooth brushing, duration of teeth brushing in minutes, type of toothbrush, type of toothpaste, time of brushing during the day, use of dental floss, use of mouthwash, miswak, toothpick. Diet: including drinking soda and other beverages.

The questionnaire and dental staining evaluation that is going to be conducted as follows. The questionnaire will contain four pictures with varying levels of stains. The first will contain no stains, the second picture contains mild staining and the third picture is moderate staining. The last one is severe staining. The four pictures provided in the questionnaire will be used by the participant to conclude the severity of their stains that will help us to divide the participants into four groups depending on their answers. Afterwards based on their answer, we will divide them in regard to the color of the stains. It will be as the following: no- stains, Mild (yellow, light brown, dark brown, black stains), moderate (yellow, light brown, dark brown, black stains), severe (yellow, light brown, dark brown, black stains)10.

The collected data is going to be entered and analyzed using the SPSS statistical program. Statistical analysis, including the following: A) descriptive statistics including number, means, and percentage. B) One-way Analysis of Variance to assess the differences in means of demographic, oral hygiene practices, smokers with tooth discolorations. The questionnaire will be validated through expert revision, and focus group test -retest for validity.

Results: We found that there is statistically significant association between traditional cigarettes and Utooth 1 (p-value=0), Utooth 2 (p-value=0), Utooth 3 (p-value=0),Utooth 4 (p-value=0),Utooth 5 (p-value=0),Utooth 6 (p-value=0.002),Ltooth 7 (p-value=0),Ltooth 8 (p-value=0.002),Ltooth 9 (p-value=0.001),Ltooth 10 (p-value=0),Ltooth 11 (p-value=0.001),Ltooth 12 (p-value=0.001). It means that more you smoke traditional cigarettes more you get teeth stain. We found that there is not a statistically significant association between electronic cigarettes smoker and Utooth 1(p-value=0.91), Utooth 2(p-value=0.697), Utooth 3(p-value=0.11), Utooth 4(p-value=0.146), Utooth 5(p-value=0.37), Utooth 6(p-value=0.777), Ltooth 7(p-value=0.137), Ltooth 8(p-value=0.304), Ltooth 9(p-value=0.432), Ltooth 10(p-value=0.401), Ltooth 11(p-value=0.171), Ltooth 12(p-value=0.612). It showed that the teeth stains such as No stain, Mild stain, Moderate stain, severe stain have equally likely to occur in Non Smoker, Regular smoker, Social smoker, Ex-smoker. And there is not any significant pattern between stains and Electronic cigarettes smoking habit. We find there is statistically significant association between hookah smokers and Utooth 1 (p-value=0.004), Utooth 2 (p-value=0.006), Utooth 3 (p-value=0.01), Utooth 4 (p-value=0.012), Utooth 5 (p-value=0.001), Utooth 6 (p-value=0.043), Ltooth 8 (p-value=0.011), Ltooth 9 (p-value=0.003), Ltooth 10 (p-value=0.001), Ltooth 11 (p-value=0.013), Ltooth 12 (p-value=0.016). But non-significant association with Ltooth 7 (p-value=0.094). As significant association showed, Hookah non-smokers have less chance to have severe stain, as compared to the regular smokers. We find there is statistically significant association between tea and Utooth 1(p-value=0.004), Utooth 2(p-value=0.016), Utooth 3(p-value=0.012), Ltooth 7(p-value=0.034), Ltooth 8(p-value=0.003), Ltooth 9(p-value=0.001), Ltooth 10(p-value=0.019), Ltooth 11(p-value=0.005), Ltooth 12(p-value=0.001). But tea have statistically non-significant association with Utooth 4(p-value=0.133), Utooth 5(p-value=0.125), Utooth 6(p-value=0.101). The significant association could simple describe as the more you have tea intake the more severe your teeth stains will be. There is statistically significant association between Coffee and Utooth 4(p-value=0.012), Utooth 6(p-value=0.041), Ltooth 11(p-value=0.04). Through significant association we examine those participants who have intake of coffee are more likely to have stains compared to those who don't have coffee consumption.

But non-significant association with Utooth 1(p-value=0.89), Utooth 2(p-value=0.723), Utooth 3(p-value=0.268), Utooth 5(p-value=0.281), Ltooth 7(p-value=0.063), Ltooth 8(p-value=0.446), Ltooth 9(p-value=0.317), Ltooth 10(p-value=0.089), Ltooth 12(p-value=0.206).We find there is statistically non-significant association between Soft drinks

and Utooth 1(p-value=0.674), Utooth 2(p-value=0.807), Utooth 3(p-value=0.5), Utooth 4(p-value=0.462), Utooth 5(p-value=0.97), Utooth 6(p-value=0.977), Ltooth 7(p-value=0.939), Ltooth 8(p-value=0.824), Ltooth 9(p-value=0.898), Ltooth 10(p-value=0.941), Ltooth 11(p-value=0.913), and Ltooth 12(p-value=0.915). We found that either you have soft drink consumption or not, we have equally likely to have No stain, Mild stain, Moderate stain, severe stain on six upper teeth and six lower teeth.

Conclusion: Initially, we examine the teeth stains and coverage of teeth stains for all upper and lower anterior teeth. We divided the participants into two groups smoker and non-smokers. We found that smokers have higher probability to develop stains as compared to the non-smokers. As far as the teeth stain coverage we have found that the coverage varies depending on the type and frequency of the smoking type used. We divided the smokers into three groups depending on the type of smoking used. We examined each group separately to determine the teeth stains severity and coverage associated with each type. The study shows that participants who consume traditional cigarettes have developed stains as compared to those who did not smoke. We have also, found that the stain severity and coverage had a higher score in correspondence with the number of cigarettes. In regard to Hookah, we have found similar results in terms of stain severity and coverage in hookah and traditional cigarettes smokers. For electronic cigarettes consumption the results show that there is no correlation between the frequency of consumption, stain coverage and stain severity. This shows that electronic cigarette does not affect the teeth color in a similar manner like traditional cigarette and hookah. We also considered the effect of staining beverages such as, coffee, tea, and soft drinks. Therefore, by using chi square results of association between tea, and coffee consumption we have noticed that the severity of the stain was worsened with increased consumption. Inversely, the consumption of soft drink was found to be statically non-significant in terms of stain severity. finally, we took oral hygiene habits into consideration and noticed There is statistically non-significant association between number of times the brush habit of smokers and the severity.

Abstract No. 33

Coronoid Foramina of Mandible: A Recent Discovery in Humans Clinical Series of 48 Patients Including a Pediatric Variant

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Objectives: The aim of this observational clinical study is to determine the prevalence of coronoid foramen using panoramic radiographs and CBCT while evaluating its variability in terms of unilateral, bilateral or gender predilection and propose the significance of this recently discovered anatomic variation

Materials and Methods: A total of 987 OPGs were scrutinized for presence of coronoid foramina and confirmed using 3D CBCT scans from Aug 2017 till date. Descriptive and inferential analysis was done , significance is assessed at 5% level. Chi-Square /Fisher Exact test was used to find the significance of study parameters on categorical scale between two or more groups, Non-parametric setting for Qualitative data analysis. Fisher Exact test was used when cell samples were small & Statistical software SPSS 2 2.0 and R environment 3.2.2 were used for statistical analysis purposes.

Results: A total of 48 patients were identified to have the variation in the mandibular coronoid process, which constituted a 5% of the total OPGs evaluated.

Conclusion: Every surgeon needs to have a dogmatic approach with understanding of anatomical variations as they may potentially defeat a clinician from achieving successful treatment outcomes. Pertinent diagnostic and pre-surgical assessment of the region will not only help to assess any anatomical variants present, but also inuences the outcome of surgical procedures related to that particular region along with preventing any sort of iatrogenic injuries to these variant structures post operatively. It is undeniable that diagnostic to prognostic evaluation of such patients needs to be studied further for better understanding of the outcome.

Abstract No. 34

Comparative Effectiveness of Botulinum Toxin and Physical Therapy for TMD Patients: A Systematic Review of Randomized Controlled Trials

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Objectives: 1- Compare and identify the clinical effectiveness of physical therapy and botulinum toxin. 2- Provide a better understanding of the clinical effects and limitations of botulinum toxin and physical therapy as a conservative treatment for TMD patients. 3- Determine which clinical conservative approach of management is better for Patients with TMD.

Materials and Methods: This systematic review targeted all randomized clinical trials (RCTs) from 2015-2020 that were on the effects of botulinum toxin or any physical therapy intervention on patients with Temporomandibular disorders. A comprehensive search at eight major electronic databases were performed. Based on the inclusion criteria, fourteen articles were identified (nine physical therapy and five botulinum toxin).

Results: Both treatment outcomes showed reduction in tenderness and pain. Pain reduction was more significant in physical therapy. Three articles of the included studies stated that physical therapy has lower cost compared to botulinum toxin therapy. Eight articles measured maximum mouth opening, six studies showed an improvement by physical therapy and one was with Botulinum toxin therapy. Only one study on botulinum toxin showed no difference.

Conclusion: Physical therapy and botulinum toxin were effective in improving pain reduction, muscle tenderness and maximum mouth opening among patients with Temporomandibular disorders. However, the included articles on physical therapy were larger in number and showed higher evidence compared to botulinum toxin. Botulinum toxin had shorter-term effects compared to physical therapy. More well-designed randomized controlled trials should be carried out in future studies with larger sample sizes and longer follow-up periods.

Abstract No. 35

Effectiveness of deep breathing exercise as a management approach towards bruxism among dental students

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Objectives: To assess the effectiveness of a deep breathing exercises approach to manage bruxism among a cohort of dental students with self-reported bruxism.

Materials and Methods: This experimental study was conducted in two phases among 48 undergraduate dental students in the preclinical and clinical years who self-reported bruxism as well exhibited common signs and symptoms of bruxism. Following their response to a pre-validated questionnaire which assessed the presence of bruxism as well as perceived stress the eligible participants were examined for common signs and symptoms of bruxism to confirm the diagnosis. In phase two, following informed consent the participants were asked to perform a 10-minute deep breathing exercise protocol once daily for a period of four weeks. The occlusal biteforce was evaluated using Flexiforce® (Tekscan) device pre- and post- intervention and compared and analyzed using JMP statistical software.

Results: The results demonstrated that 25.3% of the dental students at KSAU-HS had bruxism. Moreover, the most common sign of bruxism was linea alba (Cheek Bite Keratosis) which has been found in 76% of our participants. the t-test results showed statistically significant difference and the mean post intervention bite force was found to be 65.6±14.5 N less than the pre- intervention values. However, there was no significant difference between the pre- and post-intervention perceived stress levels among the participants.

Conclusion: Breathing exercises has been shown to be effective in decreasing the occlusal bite force of patients diagnosed with bruxism thus might be considered an effective adjunctive therapy to treat bruxism till further evidence prove otherwise.

Abstract No. 36

Occupation stress and stress busters utilized among Saudi dental practitioners during COVID-19 pandemic- A cross sectional survey

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Objectives: This study aims to assess the stress levels, stress busters, and coping mechanisms among Saudi dental practitioners (SDPs) during the COVID-19 pandemic outbreak

Materials and Methods: Self-administered questionnaire was sent to SDPs via Google forms. Cohen's stress score scale was used for stress evaluation, and the mean scores were compared based on age, gender, qualification, and occupation. Comparisons of the utilization of stress coping mechanisms and stress busters based on gender, age, and occupation were evaluated. Descriptive statistics were carried out using SPSS (Version 21.0, Chicago, Illinois, USA).

Results: A total of 206 SDPs (69% males and 31% females) participated in the study. Male SDPs showed a higher score than females ($P>0.05$). SDPs around 50 years and above obtained high-stress scores (25 ± 7.4) as compared to other age groups ($P<0.05$). The occupational level showed higher stress scores (22.6 ± 4.6 than the other occupation groups ($P<0.05$). The majority of the SDPs used watching TV/ mobile/ computer (80%) as a stress buster, followed by binge eating (64%), exercise (44%), smoking (32%), do it yourself (DYI-23%), and meditation (17%).

Conclusion: SDPs are experiencing stress levels during this COVID-19 pandemic time. Male SDPs above 50 years and private practitioners showed higher levels of stress scores. An overall commonly used stress buster was smoking in males and mediation in females.

Abstract No. 37

Is it better to restore or extract deciduous teeth?

Noura Alturki, Sara Alshammery

Objectives: To measure the awareness of the parents about importance of primary teeth.

Materials and Methods: A cross section survey was distributed to the parents by social media " twitter, Instagram, WhatsApp application" the total response 1820 Pearson. The questionnaire consisting of 17 questions were distributed, The demographic details taken from the parents included questions such as parents' relationship to the child, parental age, parent's educational level, parent's income, and the number of the children in the family. Questions written in both English and Arabic languages. The purpose of the were prepared of the study to measure the care and awareness of the family for primary teeth.

Results: A total of 1820 complete the questionnaire the majority of parents interviews were mother (84.67%) with age from 36-60 years old (61.94%) lives in Central region of Saudi Arabia (65.58%) with high level of education (72.49%) and (37.83%) medium monthly income and they have 3 to 5 children (43.04%), (54.99%) of the family preferred to treat their child teeth in private hospital. The collected data shown the grate majority (75.84%) agreed of the important of the primary teeth, and agreed that caries of primary teeth would affect the permanent teeth with majority (63.95%). Most of the family preferred to treat their children teeth than to extract by (73.13%). When we asked them about the major problem they face it when they visit the dentist 79.69% agree the high cost of the treatment and (70.56%) the rarely availability of the pedodontist. High number of the family (95.57%) agree that presenting with there children in the clinic will relieves the tension of their children. 58.86% of the parents think the dentist not dealing well with there child during the treatment that's why (72.66%) of the child responding to the dentist during the treatment with tensions. (57.65%) disagree that their child requires dental visit every 6 months

Conclusion: In the present of this study the result showed most of the families preferred to treat their children teeth than to extract because they believe of the important of the primary teeth and the affected of the permanent teeth.

Abstract No. 38

The Association of Periodontitis with Systemic Manifestations and Dental Anomalies

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Objectives: 1. To investigate the association of periodontitis with dental anomalies. 2. To investigate the association of periodontitis with certain systemic manifestations and a psychological scale (HAD scale).

Materials and Methods: A total of 262 patients (100 chronic periodontitis, 81 aggressive periodontitis and 81 controls), attending the Periodontology clinics at Jordan University of Science and Technology, Dental Teaching Centre) were included. All subjects had a full periodontal and radiographic examination to assess the periodontal condition and to check for the presence of any of the following dental anomalies: dens invaginatus, dens evaginatus, congenitally missing lateral incisors or peg-shaped lateral incisors. Participants were interrogated regarding the following: depressive mood, fatigue, weight loss, or loss of appetite; and their anxiety and depression status was assessed using the Hospital Anxiety and Depression (HAD) scale.

Results: Patients with aggressive periodontitis reported more systemic symptoms (51%) than the chronic periodontitis (36%) and control (30%) patients (p <0.05). Aggressive periodontitis patients had a higher tendency for both anxiety and depression than chronic periodontitis and control patients. Dental anomalies were significantly (p <0.05) more frequent among both of chronic and aggressive periodontitis patients (15% and 16%, respectively), compared to controls.

Conclusion: In this group of Jordanians, systemic symptoms were strongly associated with aggressive periodontitis, and dental anomalies were positively associated with both aggressive and chronic periodontitis.

Abstract No. 39

Effect of Chlorhexidine-Encapsulated Nanotube-Modified Adhesive System on the Bond Strength to Human Dentin

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Objectives: The purpose of this study was to synthesize chlorhexidine(CHX)-encapsulated nanotubes (HNTs) and to incorporate them into the primer/adhesive components of an etch-and-rinse adhesive system (SBMP; Scotchbond Multipurpose, 3M ESPE) and to test their effects on degree of conversion, viscosity, immediate and long-term bonding to dentin.

Materials and Methods: CHX-modified HNTs were synthesized using 10% or 20% CHX solutions. The primer and the adhesive components of SBMP were incorporated with 15 wt.% of the CHX- encapsulated HNTs. Degree of conversion (DC) and viscosity analyses were performed to characterize the modified primers/adhesives. For bond strength testing, acid-etched dentin was treated with one of the following: SBMP (control); 0.2%CHX solution before SBMP; CHX-modified primers + SBMP adhesive; SBMP primer + CHX- modified adhesives; and SBMP primer + CHX-free HNT-modified adhesive. The microtensile bond strength test was performed after immediate (24 h) and long-term (6 months) of water storage. Data were analyzed using ANOVA and Tukey ($\alpha=5\%$) and the Weibull analysis.

Results: DC was greater for the CHX-free HNT-modified adhesive, whereas the other experimental adhesives showed similar DC as compared with the control. Primers were less viscous than the adhesives, without significant differences within the respective materials. At 24 h, all groups showed similar bonding performance and structural reliability; whereas at the 6-months period, groups treated with the 0.2%CHX solution prior bonding or with the CHX-modified primers resulted in greater bond strength than the control and superior reliability.

Conclusion: The modification of a primer or adhesive with CHX-encapsulated HNTs was a successful approach that did not impair the polymerization, viscosity and bonding performance of the materials, showing a promising long-term effect on resin-dentin bonds.

Abstract No. 40

Awareness of Short and Long-Term Complications of Dental Veneers among Saudis in Riyadh, Kingdom of Saudi Arabia

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Objectives: This cross-sectional study aimed to assess the knowledge and awareness of short- and long-term complications of dental veneers among the Saudi population in Riyadh, Saudi Arabia.

Materials and Methods: There was a total of 387 participants in the study. Data were collected using self-administrated questionnaires that were modified from previous studies. The collected data were analysed using SPSS software for Descriptive statistics and Chi square test ($p < 0.05$).

Results: The mean total knowledge percentage of the participants was 33% (No=127) for a total of twenty-seven dental veneers complications' knowledge questions. The participants' knowledge of veneers complications significantly differed in relation to gender, age, level of education, monthly income and region. Analysis showed gender significant difference with more knowledgeable females than males; about chipping, debonding of dental veneers and change in phonetics at cementation time ($p = 0.0331$ & $p = 0.0072$, $p = 0.1111$). No significance between age groups about complications related to bleeding upon brushing ($p=0.0875$) and change in color ($p=0.0986$). College graduates and postgraduate degree holders had more knowledge regarding gum recession ($p=0.0260$), and wearing of opposing dentition ($p=0.0473$), with no significant difference ($p < 0.05$) of level of education toward other veneer problems ($p= 0.8279$). Monthly income has no significant effect on community awareness of dental veneer complications ($p = 0.1023$). Only 6% of respondents had the knowledge about all post cementation precautions needed for care of dental veneers.

Conclusion: The overall knowledge regarding dental veneers was low and needs improvement. Social media was the main source of information.

Abstract No. 41

The Prevalence of Endodontic Instrument Separation among Dental Practitioners and Dental Students in Riyadh, Saudi Arabia: A CrossSectional Study

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Objectives: The primary determinant to achieve a successful root canal treatment is thorough and diligent techniques to prevent future encroachment of bacteria. Poor technique can be manifested in numerous ways, one of them is instrument separation. This is a cross-sectional retrospective study aimed to investigate the prevalence of endodontic instrument separation among dental practitioners and dental students in Riyadh city. And to evaluate their knowledge and skills in preventing and managing such mishaps during endodontic treatment.

Materials and Methods: A survey was distributed in hard and soft copy forms. Target subjects were Undergraduate students, Dental interns, General practitioners, Postgraduates Endodontic, advanced general dentistry (AGD), Saudi board advanced restorative dentistry (SBARD), and Endodontists. The questionnaire contained three domains: demographic data, incidence of instrument separation, management and follow up of instruments separation. Data were statistically analysed, and the significance level was set at $p<0.05$.

Results: The study includes 455 subjects. Determined percentage of instrument separation with hand file was 56.1% rotary file was 43.9%, Nickel Titanium alloy was 49.8% and Stainless-steel was 50.2%. Comparable percentage of instruments separation in molars was more than other teeth (52.4%).

Conclusion: The prevalence of instrument separation during root canal treatment was very high. Students and dentist awareness regarding causes and management of instrument separation should be increased to ensure successful root canal treatment.

Abstract No. 42

Assessment of color stainability of mailed CAD/CAM ceramic materials after hot and cold coffee immersion at different time intervals

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Objectives: Background: Drinking coffee is a daily habit and widespread among publication either locally or internationally. This may cause a series problem such as tooth or restorations staining. This in-vitro spectrophotometric study was designed to assess and record the color stability of CAD/CAM restorative materials (VITA Suprinity, Vita Enamic, and Vitablocs Mark II) with different exposed surfaces (glazed or polished) following exposure to staining ''hot Arabic Qahwa and cold coffee'', and to compare these changes on the basis of VITAPAN Classical shade guide.

Materials and Methods: Ninety-six specimens were fabricated and prepared from VITA Suprinity (VITA-S), Vita Enamic (Vita-E), and Vitablocs Mark II (Vitablocs-MII), then divided into two equal groups with different surfaces (glazed or polished). All specimens were weighted, then, by using the spectrophotometer device, the specimens color was measured in comparing to VITAPAN Classical shade guide as (baseline color), the color of the specimens in L,a,b were assessed and recorded as before immersion and staining. The two equal groups specimens were immersed in Instant-Arabic Qahwa and Frappuccino cold Coffee Drink. During coffee immersion and aging period, other measurements of the specimens were performed after 2,4, and 12-weeks. Those measurements were accounted as 1st, 2nd, and 3rd measurements for VITAPAN Classical shade guide and T1, T2, and T3 for average color changes ($\Delta E00$) values specimens after staining and aging period using CIE L*a*b* equation. Staining of specimens was calculated by comparing to VITAPAN Classical shade guide and by mean of $\Delta E00$ compared to the baseline values.

Results: It was shown that there is a significant difference in the $\Delta E00$ values during the different immersing in the hot Arabic Qahwa and cold coffee for all materials tested either in glazed or/and polished specimens. Moreover, there were changes in relation to VITAPAN CLASSIC shade guide for both VITA-S and Vita-E specimens only during different periods after coffee immersions.

Conclusion: Color changes for the tested CAD/CAM prosthetic materials were within the clinically acceptable range, and the tried materials can be advised to use for patients consuming coffee daily. Polished specimens showed higher staining in comparing to glazed once. So, reglaze of those aesthetic prostheses or restorations after any intra-oral adjustments and before final cementation is recommended and essential to maintain the color stability in the oral environment. Keywords; Color stability, coffee, feldspathic Vita Mark, hybrid ceramics, lithium disilicate ceramics, staining, VITAPAN shade guide.

Abstract No. 43

Mucoepidermoid Carcinoma with Unusual Presentation Hindered Early Detection

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Objectives: Introduction: Salivary gland neoplasms are generally uncommon, accounting for 3-6% of all head and neck tumors, with mucoepidermoid carcinoma (MEC) being the most common malignant neoplasm. MEC of the oral cavity has female gender predilection and is reported to occur in a wide age range, but most commonly in middle-aged or older adults. Clinically, MEC presents as asymptomatic fluctuant, bluish or reddish swelling in hard palatal mucosa, upper labial mucosa, buccal mucosa, and tongue. Herein, we report a case of a long-standing MEC in the left pterygomandibular fold of the oral cavity presented to the Dental clinic at the College of Dentistry, King Saud bin Abdulaziz University for Health Sciences, Riyadh, Saudi Arabia.

Materials and Methods: (It's a case report)

Results: A healthy 22-year-old female presented to the Dental clinic with an ulcerated nodule in the left pterygomandibular fold, measuring 1.3 x 1.0 x 0.5 cm. The patient was aware of the lesion for more than four years. She reported no pain with occasional bleeding after trauma to the area, and she slightly felt discomfort upon palpation during the clinical examination. A biopsy was obtained and revealed multiple cystic and solid areas of neoplastic cell proliferation. There were three cell types within the tumor islands: mucous cells, epithelioid cells, and intermediate basaloid cells. There was no evidence of necrosis, lymphovascular invasion, or perineural invasion. The tumor cells were positive for pan CK (AE1/AE3), CK7, and P63. Based on the histologic features, a diagnosis of MEC was made. The patient underwent surgical excision with a 2-mm tumor-free margin. There was no evidence of tumor recurrence at a two years' follow-up.

Conclusion: This case report highlights the variability of neoplastic presentations, which in many instances result in delayed diagnosis. Early detection and treatment in such cases are crucial to have a favorable outcome.

Abstract No. 44

Clinical Evaluation of the Effect of Coconut oil and Sesame Oil Using Microneedling Therapy on Severity of Gingival Inflammmation and Plaque Accumulation

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Objectives: This study aimed to assess and compare the efficacy of oil pulling practice using coconut oil and sesame oil adjunctive to the microneedling therapy in the reduction of gingival inflammation and plaque accumulation in gingivitis diagnosed patients.

Materials and Methods: 21 patients with clinical diagnosed plaque induced gingivitis of moderate to sever gingivitis of both genders were selected randomly from AlFarabi hospital, Riyadh, KSA. They were divided into 3 groups as following Group A; seven participants were treated with topical coconut oil using dermapen on upper anterior teeth, Group B; seven participants were treated with topical sesame oil using dermapen on upper anterior teeth, while Group C; seven patients received periodontal mechanical treatment only. Preintervention and postintervention gingival status and plaque status for all the Group participants were assessed using modified GI and PI indices at the 1st, 2nd, and 3rd week to compare the changes and difference between groups. Improvement percentage were calculated and categorized into complete improvement, reduction of GI scores and no response/exacerbation of gingival status.

Results: Group A and group B showed highly significant decrease in GI scores in comparison to baseline while group C displayed no significant difference from the base line regarding average GI ($p > 0.05$). Regarding the comparison of the three studies group to PI scores, there was no statically significant difference between the three groups ($p > 0.05$). Regarding the gingival status improvement in the 3 groups after 3 weeks of treatment, in group A, three (43%) patients showed complete healing and excellent improvement, 4 (57%)patients showed reduction in gingival inflammation and good-fair improvement. While in group B, all patients (100%) showed reduction in gingival inflammation and good to fair improvement On the other hand, group C had 2 (29%) patients showed complete healing of gingiva with excellent improvement, 4 (57%) patients displayed reduction in gingival inflammation with good- fair improvement and 1(14%) patient showed increase in gingival inflammation and no improvement.

Conclusion: Microneedling therapy is a simple office-based procedure lasts few minutes, MN causes reorganization of old collagen fibers and laying down of new collagen, elastin, and capillaries which in turn affects the fibrotic look of the mucosa, also enhance the effect of the anti-oxidant oils (coconut and sesame oils) on the gingiva and decrease the plaque formation and inflammation. Based on our study findings, we conclude that oil pulling using dermapen could be an alternative modality of treatment of the gingival inflammation. Our results revealed a noticeable improvement in gingival status and reduction of average GI and PI in comparison to mechanical debridement

alone. Undoubtedly, it promises to be a valuable technique in the treatment of periodontal diseases especially the refractory ones. However, the study samples reflected the findings in these selected groups of patients only. More studies with larger samples and a long duration of follow up periods are needed to confirm these results.

Abstract No. 45

The Influence of Orthodontic Clear Aligner Vs Fixed Appliances on Oral Microbiota and Salivary Parameters': A Systematic Review

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Objectives: the purpose of the current review is to systematically assess the literature and summarize the found evidence evaluating the impact of thermoplastic clear aligners as well as fixed orthodontic appliances on oral microbiota and salivary parameters.

Materials and Methods: This systematic review done according PRISMA guideline (Moher et al. 2011) and the Cochrane handbook (Higgins J and Thomas J. 2019). Five Electronic databases were used to search about relevant articles.

Results: A total of 5345 articles were relevant to this topic. Duplicates removed lead to 4636 articles that include in initial screening after duplicates. 7 studies were meet the eligibility criteria. Out of 4 studies classified as low risk of bias, 2 of them as moderate risk of bias, and only one study as high risk of bias. All of them were include in this systematic review.

Conclusion: Overall changes of oral microbiota are higher in patients with fixed appliances than removable appliances. No significant change in salivary flow rate nor salivary buffering power for clear aligner. While there were variations in the results of fixed orthodontic appliances group in previous studies. Whereas there were changes on other salivary parameters for fixed orthodontic groups

Abstract No. 46

Comparison of Manual Toothbrushes with Three Different Bristle Designs in Terms of Clinical Efficacy in Dental Bio-film Reduction in Fixed Orthodontic Patients

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Objectives: The aim of the study is to evaluate three types of manual toothbrushes [Cross action (CA), Flat trim (FT), and orthodontic type (OT)] in terms of efficacy in biofilm removal in patients undergoing fixed orthodontic treatment.

Materials and Methods: The experiment design followed the Consolidated Standards of Reporting Trials (CONSORT) guidelines. This was a single brushing, examiner-blinded, randomized, three treatments, three-period crossover clinical trial involving two examiners. 24 subjects were randomized to one of the three treatment sequences involving three manual toothbrushes of different bristle designs: (CA, FT, and OT). The primary outcome measure was the post brushing reduction in plaque scores. At each of the three visits, subjects arrived having abstained from oral hygiene for 24 h prior and brushed with their assigned toothbrush and a standard fluoride dentifrice. The plaque was assessed by each examiner who was blinded to the intervention using the Turesky-Modified Quigley–Hein Plaque Index at each study period before and after brushing. Data were analyzed using the mixed models for the difference in the plaque scores using NCSS version 2020.

Results: Twenty-four subjects between the ages of 18 and 25 met the entrance criteria. All the subjects completed all three periods of the study. The differences between treatments in plaque score reduction after brushing were statistically significant (p-value <.001). The treatment differences were statistically significant (p-value <.001) favoring the FT toothbrush over the OT and CA types of toothbrush designs. On the contrary, the difference between the OT and CA types was not statistically significant.

Conclusion: The conventional FT toothbrush removed significantly more plaque after a single brushing than the OT and CA types. The conventional manual toothbrush tested in this study proved to be effective in removing dental plaque in patients wearing fixed orthodontic appliances.

Abstract No. 47

Direct versus Indirect Orthodontics Bracket Bonding Technique; Utilizing 3D Digitally Reproduced Dental Models

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Objectives: The aim of this study is to compare between direct and indirect bracket bonding techniques in terms of accuracy and efficiency while utilizing 3D Technology for models reproduction of identical models for both techniques.

Materials and Methods: 10 pairs of casts have been randomly chosen to compare direct and indirect bracket bonding techniques. They have been scanned by Ceramill map 400 digital scanner and saved in STL format. The file was printed utilizing a 3D printer (ProJet MJP 3600). Five independent operators have received 2 cases for the direct bonding technique and their identical duplicate for the indirect bonding technique. Double silicon technique was used for the indirect technique, the trays were made by vacuum machines (Plast Vac P7) and (BIOSTAR, Scheu). All operators are novel in the field of orthodontics (third year dental students) and have received the same training. All models were blindly evaluated by two different independent assessors. Each assessor repeated the evaluation at two different occasions with minimum interval of 72 hours.

Results: The accuracy in positioning the brackets in the correct place using the indirect method was as good as the direct bonding method with no statistical significant difference between the two groups (Paired sample t-test; p>0.05). The study data showed that longer total time was needed to place the brackets in the indirect technique compared to the direct approach. However, when taking only the clinical time in consideration; the indirect method needed 50% less time. No significant differences were detected both in inter and intra assessor grading, however the junior assessor scores seemed to be consistently higher, the more senior assessor evaluation was more consistent in both reading.

Conclusion: Indirect bonding takes almost double the total time, but shorter clinical time and as accurate as the direct bonding technique. The indirect method saved almost 50 % of the clinician's time, but was more demanding on the lab technicians. This study concluded that indirect bonding techniques should be utilized much more as it saves more than 50% of clinic time and produce accurate bracket positions. Further in Vivo studies are recommended to confirm these findings.

Abstract No. 48

Forensics Odontology: A Tool for disaster victim identification

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Objectives: Forensics is set in motion when any incident is discovered, may it be natural or manmade a disaster has its own impact on the society. A disaster recovery plan is intended to help restore a system to its full functionality after an incident. And most important is the identification of the deceased, which is a challenging task.

Materials and Methods: Recently the global threat scenario has seen the emergence of high impact events. Events like Hurricanes, Earthquake and tsunami all the while global terrorist activities have become the new norm.

Results: Application of forensic odontology is primarily in identification of post-mortem remains by the careful examination of teeth, identification of perpetrators of crimes from analyzing bite marks, and estimation of dental age of an individual from either dental radiographs, teeth and photographs. However, the very existence of this specialty today owes, perhaps, to the utilization of the dentition in the distinguishing human remains.

Conclusion: Thus Forensic Odontology approaches such as Dental identification can be used as the sole method of identifying a deceased person and can play active role in Disaster Victim identification

Abstract No. 49

What is the effect of maxillary expansion on the maxillary arch width in patients with bilateral cleft palate: A systematic review and meta-analysis

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Objectives: The purpose of this systematic review is to determine the effect of slow and rapid maxillary expansion on maxillary arch width in patients with bilateral cleft palate.

Materials and Methods: This systematic review was performed according to the Cochrane Handbook (Higgins and Thomas, 2019) and reported using PRISMA guidelines (Moher et al., 2011). -Electronic search was conducted in Medline, PubMed, Cochrane (CENTRAL) and (CDSR), OpenGrey, and ClinicalTrials.gov. -The following criteria were used to refine the articles included in the search: Study Design: randomized controlled clinical trials. Population: human subjects with bilateral cleft palate. Intervention: maxillary expansion. Outcome Measures: maxillary arch width. - Meta-Analysis was done for maxillary arch width.

Results: A total of 1184 articles were relevant to this topic. Duplicates were removed lead to 846 articles. There were two studies met our eligibility criteria. Both of included studies had moderate risk of bias. There were multiple measures in included studies, but maxillary arch width was the only similar measures in both studies.

Conclusion: There are no differences in maxillary arch width between SME and RME in patient with bilateral cleft palate.

Abstract No. 50

The Association Between Post-Traumatic Stress Disorder and Temporomandibular Disorders: A Systematic Review

Sarah Alanazi, May Alkhudhairy

Objectives: To investigate the association between PTSD and TMD

Materials and Methods: The reporting of this systematic review was done in line with the Preferred Reporting items for Systematic Review and Meta-Analysis (PRISMA) guidelines (Moher et al., 2015). Taking into consideration the nature of the current study no approval by an institutional review board was necessary.

Eligibility criteria: The PICO process (Population, Intervention/ Incidence, Comparison, Outcomes) was used to formulate the focused question in this Systematic Review, in which: P) population with PTSD; I) Presence of TMD; C) Non-PTSD controls; and O) Association between PTSD and TMD (Odds Risk of getting TMD if the person has PTSD) (Stone PW, 2002).

Inclusion criteria consisted of observational studies in English language, published between 2010 until 2020, addressing the association between TMDs in the presence of PTSD. Levels of evidence (LoE) were assessed according to Global Spine J. (2015), articles with levels I through III only were included.

The following exclusion criteria were applied: (a) Studies in which TMD assessment methods (self-report, clinical examination) were not reported or not sufficiently described; (b) Studies with no control group; (c) Reviews, letters, conference abstracts, personal opinions, case reports and laboratory research; (d) Full-text not available or not available in English.

Results: This systematic review aims to investigate the association between the signs and symptoms of Post-Traumatic Stress Disorder (PTSD) and Temporomandibular Disorders (TMDs). The Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV, 1994) has been the most commonly used in four of our included studies for the diagnosis of PTSD (Kindler et al., 2019; Mottaghi and Zamani, 2014; Muhvić-Urek et al., 2015; de Oliveira Solis et al., 2017). To fulfill the DSM-IV criteria for PTSD, an individual must have been exposed to a traumatic event (Criterion A), have at least one re-experiencing symptom (Criterion B), three avoidance symptoms (Criterion C), and two hyperarousal symptoms (Criterion D) (DSM-IV, 1994; Forman-Hoffman et al., 2018).

One study (Kindler et al., 2019) had examined the correlations between TMDs and PTSD criteria. In particular, criterion D (Hyperarousal symptoms). This study is a population-based study done on a representative sample from the general population of northeastern Germany. The results reported a moderate to a strong association between symptoms of PTSD and TMD. Subjects with clinical PTSD had demonstrated a 2.56-fold increase in joint pain and a 3.86-fold increase in muscle pain than subjects with no clinical PTSD.

Conclusion: In conclusion, the evidence obtained from the studies included in this review suggests consistent findings of a clear relationship between PTSD and TMDs. This association between PTSD and TMDs should be considered by clinicians when developing strategies for screening and managing both TMDs and PTSD.