Vice Deanship for Postgraduate Studies and Scientific Research

Initiative of Research Unit of College of Dentistry, University of Dammam

Research Unit

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Three new machines have been installed in the Dental Biomaterials research laboratory.

a) Dental Air Abrasion Machine

Air abrasion machine is generally used in dental practice as a micro etcher or dental 'sandblaster'. With no direct contact with the tooth structure, it produces no vibration, turbine noise, heat generation, or smell, and it greatly reduces the need for local anesthesia.

Many in-vivo or in-vitro procedures can be performed which include Class I-V minimally invasive cavity preparations, hard caries removal, sandblasting castings, sealant preparation, tarnish removal from amalgam restorations and sealant preparations.

b) Sieve Shaker Machine

The Endecotts Minor M200 vibrating shaker is designed to conduct sieve tests in conjunction with sieve stacks for particle sizing of various material samples. The fixed amplitude shaker is operated by a single process timer which provides a range of incremental periods or continuous running.

c) Olympus Crystal Eye Spectrophotometer

Crystal eye ascertains tooth colors from photographs taken inside the oral cavity, which is shielded from external light. Then, the laboratory can photograph the prostheses with special equipment that eliminates external light, providing a true-to-life view of the restoration. It measures light wavelengths that are reflected off a tooth using fiber-optics. This information is then analyzed and compared with various standard shade guides and stored in the computer's database. It measures hue, chroma, and value, and then presents that data as a digital shade map of the tooth in the shade system the user chooses.

We would like to congratulate Dr. Fahad Al-Harbi on receiving ‘Research Excellency Award’ for his recent publication

RECENT FACULTY PUBLICATIONS (Most recent first)


Abstract

The prevalence of dental caries is increasing across different nations around the globe. A review of the literature shows that dental caries is adversely affecting the oral health of children, adolescents, adults and elderly populations in Saudi Arabia. The objective of this review is to report the prevalence, severity, and progression of dental caries in different age groups of Saudi communities. Digital databases such as PubMed, Medline, Google scholar, and the Saudi Dental and Medical Journals were searched to retrieve the published articles and reports on dental caries in Saudi Arabia. Search strategy included key words such as "dental caries," dental decay, decayed missing filled teeth (dmft/DMFT), and oral health. Cross-sectional, retrospective and cohort studies (from 1982 to 2012) reporting the prevalence, incidence and severity of caries among children, adults and older individuals were included in the review. In children with primary dentition ages 3-7 years, the highest caries prevalence was almost 95% and maximum estimate of dmft was 7.34 during the last decade. Approximately, 91% was the highest caries prevalence and greatest DMFT value was 7.35 among the children/adolescents ages 12-19 years. The adults with a mean age between 30 and 45 years had maximum caries prevalence of 98% and DMFT of 14.53 while older individuals had greatest DMFT score of 24.3. Children, adults, and elderly populations demonstrate a higher prevalence and greater severity of caries, and secular trends also show a striking increase in dmft/DMFT and caries prevalence rates over the past few decades in Saudi Arabia.


Abstract

Objectives: This is an in vitro study comparing the flexural strength of two dental porcelain after thermocycling, repetitive multiple firings and peak firing temperature (PFT) modifications. Materials and Methods: Two types of dental porcelains were used in this study: Cercon® Cream Love and Cercon® Cream Kiss (DeguDent, Hanau-Wolfgang/Germany). A total of 50 specimens per porcelain were divided into five groups with ten specimens per group. The first group was fired following the manufacturer’s recommendations (control). The second group was fired 10 times repetitively, and the third group was fired and then exposed to 3000 episodes of thermocycling. The fourth group was fired with the PFT modified by + 10°C. The last group was fired with the PFT modified by −10°C. All specimens were tested for flexural strength with the three-point bending test using a universal testing machine (Instron) with a crosshead speed of 0.5 mm/min. Results: The flexural strength, mean (standard deviation [SD]) MPa, of Cercon® Ceram Kiss were: Control, 59.6 (7.82); 10 firings, 82.37 (26.32); thermocycling, 68.93 (9.55); PFT (+10°C), 75.28 (5.63); and PFT (−10°C), 75.94 (2.85). The results for the flexural strength, mean (SD), of Cercon® Cream Love were: Control, 59.33 (9.9); 10 firings, 106.07 (28.43); thermocycling, 69.87 (11.17); PFT (+10°C), 65.7 (10.46); and PFT (−10°C), 51.1 (16.56). Conclusion: There was no difference in the flexural strength between the two veneering porcelains. In addition, repetitive firings significantly improved the flexural strength of both porcelains. Thermocycling significantly increased the flexural strength of both porcelains. There were no significant differences in the flexural strength when changing the PFT for Cercon® Ceram Love. Increasing and decreasing the PFT significantly increased the flexural strength of Cercon® Ceram Kiss.


Abstract

A cross sectional study was conducted to assess the patterns and habits of tooth surface loss in association with tooth brushing/soft drink consumption amongst 18-34 years old. 100 healthy patients of 18-34 years of age with tooth surface loss were included in the study. A structured questionnaire was filled by each patient which included patients’ demographic data, information on patients presenting complaints. Past dental history was also asked. Data was statistically analysed for descriptive statistics by performing chi-square test test, using SPSS version 19. p-value was set at 0.05. 12(60%) of females who consumed soft drinks sometimes, reported localized tooth
surface loss in anterior teeth and 2(66.7%) of females reported generalized tooth surface loss on consumption of soft drinks. 10(52.6%) of females who brushed their teeth regularly reported localized tooth surface loss in anterior teeth and 2(50%) of females reported generalized tooth surface loss. 11(55%) of females reported localized tooth surface loss who brushed their teeth once a day and 3(60%) of females reported generalized tooth surface loss. 19(70.4%) of males who brushed their teeth for 1 min reported localized tooth surface loss in anterior teeth and 2(66.7%) of males reported generalized tooth surface loss. Soft drink intake in daily life has become challenging. The present survey was done in a small sample of population to assess the correlation of tooth surface loss with soft drink consumption and improper brushing habits.


**Abstract**

**Objectives:** To evaluate patients’ perception regarding treatment and environment in the interns’ clinic at a university dentistry clinic. **Methods:** This cross-sectional study was conducted between July 2012- May 2013 at the College of Dentistry, University of Dammam, KSA. A self-directed questionnaire was distributed to 220 randomly selected patients, and the response rate was approximately 68%. Patients’ were asked regarding dentists’ behavior, treatment, and clinical environment along with their demographics, and socioeconomic status. **Results:** Out of the 220 randomly selected patients, 150 participated in the study. The average age of a respondent was 32.5 years (±14.5), 89 of the 150 participants were Saudi nationals. Collectively, 86% were satisfied with the doctors’ behavior, and approximately 94% responded that the dentist listens to their concerns. Most (83%) were satisfied with the treatment plan provided by the interns. **Conclusion:** The findings show that more than 80% of the participants were satisfied with the quality of treatment and clinical environment. The dissatisfaction rate was minimal (13%) and for this reason, it is difficult to establish the factors for patients dissatisfaction.


**Abstract**

**Objectives:** The purpose of this study was to analyse and compare the perceived relevance of oral biology (OB) with dentistry as reported by dental students and interns and to investigate the most popular teaching approach and learning resource. **Methods:** A questionnaire aiming to ask about the relevance of OB to dentistry, most popular teaching method and learning resource was utilised in this study. Study groups encompassed second-year dental students who had completed their course and dental interns. The data were obtained and analysed statistically. **Results:** The overall response rate for both groups was 60%. Both groups reported high relevance of OB to dentistry. Perception of dental interns regarding the relevance of OB to dentistry was higher than that of students. Both groups identified student presentations as the most important teaching method. Amongst the most important learning resources, textbooks were considered most imperative by interns, whereas lecture handouts received the highest importance score by students. **Conclusions:** Dental students and interns considered OB to be relevant to dentistry, although greater relevance was reported by interns. Year-wise advancement in dental education and training improves the perception of the students about the relevance of OB to dentistry.


**Abstract**

The aim of this article was to analyze the theories underpinning dental fear, anxiety and phobias. To be included, articles must have been published between the years of 1949 and 2013 concerning fears and phobias within dentistry and/or psychiatry. Of 200 articles originally under review, 140 were included and reviewed by the authors. Five specific pathways relating to dental fear and anxiety were identified; Cognitive Conditioning, Informative, Visual Vicarious, Verbal Threat, and Parental. Eight currently accepted management techniques across
all dental disciplines for dental fear and anxiety were identified. Further research is required to identify clinical diagnosis and treatment for fears originating from different pathways.


Abstract

This study analyzed the preference of dental students for oral biology questions that require either an interpretive or a descriptive approach to answer and to compare the preferences with their final examination result retrospectively. A questionnaire requiring student academic number and containing two questions (one asked with an interpretive approach/the other asked with a descriptive approach) from random topics of oral biology course was distributed among students who have already appeared in the final examination. Majority of the students who had achieved good grades (A+, A, B+, B) preferred interpretive questions whereas majority of the students with average grades (C+, C, D+, D) selected descriptive questions. Common reason for picking interpretive question was that it enhances critical thinking. The descriptive questions were argued to provide students with a chance to explain more. Hence, students should be encouraged to learn interpretively to promote enquiry based learning.

IN PRESS PUBLICATIONS


Abstract

Objective: This is a pilot case-control study conducted to investigate the prevalence of dental caries and periodontal disease and examine the possible association between oral health deterioration and SCD severity in a sample of Saudi SCD patients residing in the city of Al-Qatif, Eastern Province, Saudi Arabia. Materials and Methods: Dental examination to determine the Decayed, Missing and Filled Teeth index (DMFT), Community Periodontal Index (CPI), and plaque index system were recorded for 33 SCD patients and 33 age and sex-matched controls in the Al-Qatif Central Hospital, Qatif, Saudi Arabia. Self-administered surveys used to assess socio-economic status; oral health behaviors for both SCD patients and controls were recorded. In addition, the disease severity index was established for all patients with SCD. SPSS data analysis software package version 18.0 was used for statistical analysis. Numerical variables were described as mean with a standard deviation. Results: Decayed teeth were significantly more in individuals with ages ranging from 18 to 38 years with SCD compared to the control group (p = 0.036) due to oral hygiene negligence. The mean number of filled teeth was significantly lower in individuals with SCD when compared to the control group (p = 0.015) due to the lack of appropriate and timely treatment reflected in the survey responses of SCD patients as 15.2% only taking oral care during hospitalization. There were differences between the cases and controls in the known caries risk factors such as income level, flossing, and brushing habit. The DMFT, CPI, and plaque index systems did not differ significantly between the SCD patients and the control group. Conclusion: The results of our study suggest that patients with SCD are more susceptible to dental caries compared to general population in this community, with a higher prevalence of tooth decay and lower prevalence of filled teeth. Known caries risk factors influenced oral health more markedly than did factors related to SCD.

**Abstract**

**Aim:** Numerous reports implicate depression as a risk factor for impaired bone mass and micro-architecture, and the use of several antidepressants were found to increase the incidence of osteoporotic fractures. The aim of the present study is to investigate the possible alleviating effects of the antidepressant bupropion on the femoral bones of ovariectomized (OVX) rats as a model of osteoporosis. **Methods:** The OVX animals were treated with bupropion (30 and 60 mg·kg⁻¹·d⁻¹) for six weeks. Bone turnover biomarkers and inflammatory cytokines were determined using ELISA techniques. Inductively coupled plasma mass spectroscopy (ICP-MS) was used to determine the effect on femoral bone mineral concentration. Changes in bone cortical and trabecular morphometric parameters were determined using micro-CT scan and histopathology. **Results:** Estrogen deficiency elevated the level of bone turnover biomarkers as well as inflammatory cytokines. Femoral bone mineral concentrations were reduced in OVX rats. Moreover, cortical and trabecular morphometric parameters and the histopathology of femoral bones were severely altered by ovariectomy. Treatment with bupropion inhibited the increase in bone turnover biomarkers as well as inflammatory cytokines. These effects were observed most robustly with the treatment of bupropion at the higher dose of 60 mg·kg⁻¹·d⁻¹. Additionally, the animals treated with bupropion expressed normal mineral values in the femoral bones. The altered morphometric parameters and histopathology of the femoral bones were markedly attenuated by bupropion treatment. **Conclusion:** The demonstrated osteo-protective properties of bupropion may be due to its ability to inhibit osteoclastogenesis-inducing factors and inflammation, which stabilize the osteoclasts and decrease bone matrix degradation or resorption.


**Abstract**

To review the new role of an age-old micronutrient - ascorbic acid - in the management of periodontal disease. Articles pertaining to the topic were searched in PubMed and other search engines from year 1974 to April 2014 with the following key words: "ascorbic acid," "ascorbate," "vitamin C," "periodontal disease," "gingivitis," "periodontitis," "anti-oxidants" and "elderly." Balanced nutrition is an essential factor in the elderly. Modification of nutritional requirement is important to overcome the effect of an unbalanced diet in older individuals as a result of several external and internal host-associated factors. Micronutrient requirements as aging advances could change, and require due attention. Ascorbic acid and its relationship with periodontal disease are very well known. However, recent changes in the concept of understanding the pathogenicity has led to a new path of therapeutic intervention with ascorbic acid in many chronic diseases. Oxidative stress with its associated burden might alter the disease process. In the era of "periodontal medicine," the impact of remote tissue changes on systemic disease has to be taken into serious consideration. Deficiency of nutritional impact on the host, with micronutrient vitamin C detailed in this review with sources, absorption, interaction and its relationship with systemic disease, and thereby the impact on periodontal disease. Ascorbic acid plays an important role in the aging process, and in the maintenance of periodontal health in the elderly.


**Abstract**

**Purpose:** To assess the accuracy of two screening methods used by dentists in the Health Insurance Organisation in Alexandria, Egypt aiming at identifying children who need referral for treatment. **Materials and Methods:** The study included 45 dentists who examined 30 children using exclusively visual screening (VS) and visual screening with tongue blade (VSTB). A benchmark dentist examined the same group of children using mirror and probe (MP).
VS and VSTB were compared to MP. Sensitivity (Sn), specificity (Sp), positive and negative predictive values (PPV and NPV, respectively) were calculated. The effect of dentist’s gender, year of graduation and having postgraduate studies on the accuracy of the two methods was assessed. Results: VS had greater accuracy than VSTB. Both methods had a Sn and Sp >82%. The PPV of both methods was >97%, whereas that of NPV was ≤ 44%. Males and recent graduates performed better than females and senior dentists when using VS and VSTB methods. Conclusions: It is questionable whether screening using VS or VSTB can ensure effective referral of children for treatment. Further studies are needed to assess other aspects of screening, including whether referred children actually seek care and whether screening improves children’s oral health.

**ON GOING RESEARCH PROJECTS**

**Laboratory Projects**

1. **Project title:** Comparison of Bioglass™, hydroxyapatite, and alumina powders for cutting cavities in teeth by air abrasion  
   (PI: Dr. Imran Alam Moheet)

2. **Project title:** Cytoskeletal differentiation of malignant and benign salivary gland tumors: An immunohistochemical analysis  
   (PI: Dr. Aiman Ali)

3. **Project title:** Effect of low level laser irradiation on orthodontic tooth movement in rabbits with periodontal problems  
   (PI: Dr. Essam Nassar)

4. **Project title:** Expression of p53 and p21 in malignant and benign salivary gland tumors: An immunohistochemical analysis  
   (PI: Dr. M. Gameel)

5. **Project title:** The Morphology of the root canal system of the maxillary second premolar tooth in saudi population  
   (PI: Dr. Mutasim AlNour)

6. **Project title:** Effect of Aging Regimen on Ceramic and Resin Nanoceramic chairside CAD CAM materials  
   (PI: Dr. Neveen Mokhtar)

7. **Project title:** The Long Term Color Stability of Commonly Used Pediatric Dental Crowns: an In-Vivo study  
   (PI: Dr. Yousef Al Yousef)

8. **Project title:** The effect of Ageing on Dental resin cement color  
   (PI: Dr. Nijad Mina)

9. **Project title:** In vitro dentin tubule occlusion and remineralization competence of various toothpastes  
   (PI: Dr. Imran Farooq)

**Clinical Projects**

1. **Project title:** Prevalance and risks of snoring and sleep apnea symptoms in adult dental patients  
   (PI: Dr. Thikriat Al-Jewair)

2. **Project title:** Preferred learning styles among students in a dental institution in Saudi Arabia  
   (PI: Dr. Muhammad Ashraf Nazir)

3. **Project title:** What Are The Characteristics of Effective Dentsity Teacher? The perceptions of students and teachers from the University of Dammam  
   (PI: Dr. Muhammad Ashraf Nazir)
## INTERNS RESEARCH PROJECTS

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<th>Name of intern(s)</th>
<th>Title</th>
<th>Specific field of research</th>
<th>Type of the research</th>
<th>Duration</th>
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<tr>
<td>2014100</td>
<td>Dr. Abdul Khabeer</td>
<td>Theeb Alquria, Mohammed Al-Gady</td>
<td>Types of light curing units and their intensity output in private clinics of Dammam.</td>
<td>Restorative</td>
<td>Survey</td>
<td>9 months</td>
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<td>2014101</td>
<td>Dr. Thikriat Al Jewair</td>
<td>Dima Talal AlDomiati, Samia Qasem Mohammed.</td>
<td>Orthodontic retreatment in adult Saudi patients in Eastern province KSA and survey of contributing factors.</td>
<td>Orthodontics Epidemiology</td>
<td>Survey</td>
<td>3 months</td>
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<td>2014102</td>
<td>Dr. Mohammed AlOlyani</td>
<td>Hussain Miva, Ahmed Al-Saleh</td>
<td>The relationship between Diabetes and oral health.</td>
<td>Public health</td>
<td>Clinical &amp; Survey</td>
<td>6 months</td>
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<td>2014103</td>
<td>Dr. Mohammed AlOlyani, Prof. Dr. Khalid AlMas</td>
<td>Mohammed Al Abbad</td>
<td>In vitro effects of alcohol and non alcohol mouth rinses on a nanofilled resin composite.</td>
<td>Periodontology, Restorative</td>
<td>Experimental</td>
<td>4 months</td>
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<td>2014104</td>
<td>Dr. Mohammed Nazir</td>
<td>Hatim alqurashi, Majed al-farea, Husam alshumrani</td>
<td>Prevalence of malocclusions among high school students in the eastern province of Saudi Arabia</td>
<td>Orthodontics</td>
<td>Survey</td>
<td>1 Year</td>
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<td>2014105</td>
<td>Dr. Imran Moheet</td>
<td>Abdullah al-khamsi &amp; Qasim Al-dajani</td>
<td>Comparison of anterior prosthesis aesthetics between Saudi dentists and lay people.</td>
<td>Prosthodontics / Aesthetic dentistry</td>
<td>Survey</td>
<td>6 months</td>
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<td>2014106</td>
<td>Dr. Balgis Osman Gaffar</td>
<td>Bassam-Al-Bassam</td>
<td>Infection control knowledge attitudes and practices among dentists in Eastern Province.</td>
<td>Infection Control</td>
<td>Survey</td>
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## STUDENTS RESEARCH PROJECTS

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<td>2014013</td>
<td>Dr. Muhammad Ashraf Nazir</td>
<td>Hamad Alsaleh, Tamim Alfaleh, Thamir Alfalah, Basel Ahmed, Khalid Aладеel</td>
<td>Role of community pharmacists in oral Health promotion in the Eastern Province, KSA</td>
<td>Dental Public Health</td>
<td>Survey</td>
<td>12 months</td>
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<td>2014014</td>
<td>Dr. Thikriat Al Jewair</td>
<td>Y. Al-Qahtani, Hashim Alnaser, Dhiya Al-Nahwy, Fawaz Al-Tuwaijri, Mujtaba Al-Abdullatif</td>
<td>Dental caries prevalence among students with hearing impairment attending government schools in the Eastern province, KSA</td>
<td>Dental Public Health</td>
<td>Survey</td>
<td>8 months</td>
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For further information and comments, please contact

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Vice Deanship for Postgraduate Studies and Scientific Research wishes you all the best for your

FUTURE RESEARCH ENDEAVORS