رؤية VISION 2030
المملكة العربية السعودية
KINGDOM OF SAUDI ARABIA

كلية طب الأسنان
COLLEGE OF DENTISTRY

جامعة الملك سعود بن عبدالعزيز للعلوم الصحية
King Saud bin Abdulaziz University for Health Sciences

SCIENTIFIC PUBLICATIONS

Updated: 31 May 2021

King Saud Bin Abdulaziz University for Health Sciences

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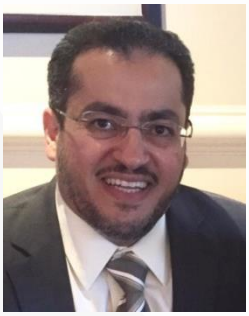
DEAN'S MESSAGE



It gives me an immense pleasure that the College of Dentistry (COD) - Research Unit has compiled an excellent Booklet that outlines COD publications since the start of the College in 2010.

This Booklet is the fruit of tremendous research works that have been conducted by the COD faculty members and students. It not only provides a glimpse of continuous achievement progress in different disciplines at COD but it also promotes research culture among the researchers in the Saudi community to be in harmony with the 2030 vision.

The COD Research Unit puts efforts to verify and update periodically the publications that are affiliated with our institution.

I would like to take this opportunity to deeply thank and appreciate every member who took part and put his/her valuable contributions in this booklet.

This Booklet would not have materialized without the presence of highly qualified faculty members and the support from administrative staff and IT department. I am confident that COD faculty members and students will continue this journey and raise our research asset.

Warm Regards

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

RESEARCH UNIT MESSAGE

Research is an intellectual activity that is conducted to improve the existing magnitude of knowledge, provide suitable solutions to problems, articulate new theories, and develop new methods of practice, teaching and learning. It is clearly stated in the vision and mission statements of King Saud bin Abdulaziz University for Health Sciences as well as the College of Dentistry (COD) that attaining excellence in research is one of their prime objectives and pillars. For this, teaching research method is a compulsory component in the COD study plan wherein faculty members provide active support and necessary assistance to students starting from research idea to final publication stage.

The COD authors; including faculty members (full time and joint academic appointees), teaching assistants, interns, and students have contributed to **395 publications** since **2010**. The remarkable growth is observed from one publication in the year 2011 to about 99 publications in 2020. Out of the published works, one-fourth were made with students' contributions.

This "Scientific Publications" Booklet is divided into three parts; the first section presents the bibliographic detail of publications by year, including the title, authors and the source. In order to identify the authors affiliated with COD, the names of the authors are written in bold and italic format. The segregation of publications by broad "Subject" categories along with abstracts has been presented in the second section. While the last section provides the "Author Index". These sections help to understand the research trends and pattern of publications in the field of Dentistry. The "Subject Index" identifies the preferred areas of research.

This Booklet will also serve as a reference tool for researchers and benchmark for other Colleges. It not only enhances the image of the institution but also gives a sense of pride to all the Saudi community associated with COD as it is in good alignment with the 2030 vision.

We would like to thank Ms. Shug Albarrak and Ms. Ghaida Alotaibi (Dental Students - Batch 5) who drew images for each specialty in this Booklet.

Finally, these intellectual and scholarly activities would not be possible without the active support from the COD staff members at administrative, academic, IT and clinical levels. This Booklet is dedicated to all COD faculty members, staff and students.

It is needless to say that an effort of this kind of work cannot be devoid of errors and we firmly believe that there is always scope for improvement and accordingly we will look forward to receiving suggestions, for further enriching the Booklet.

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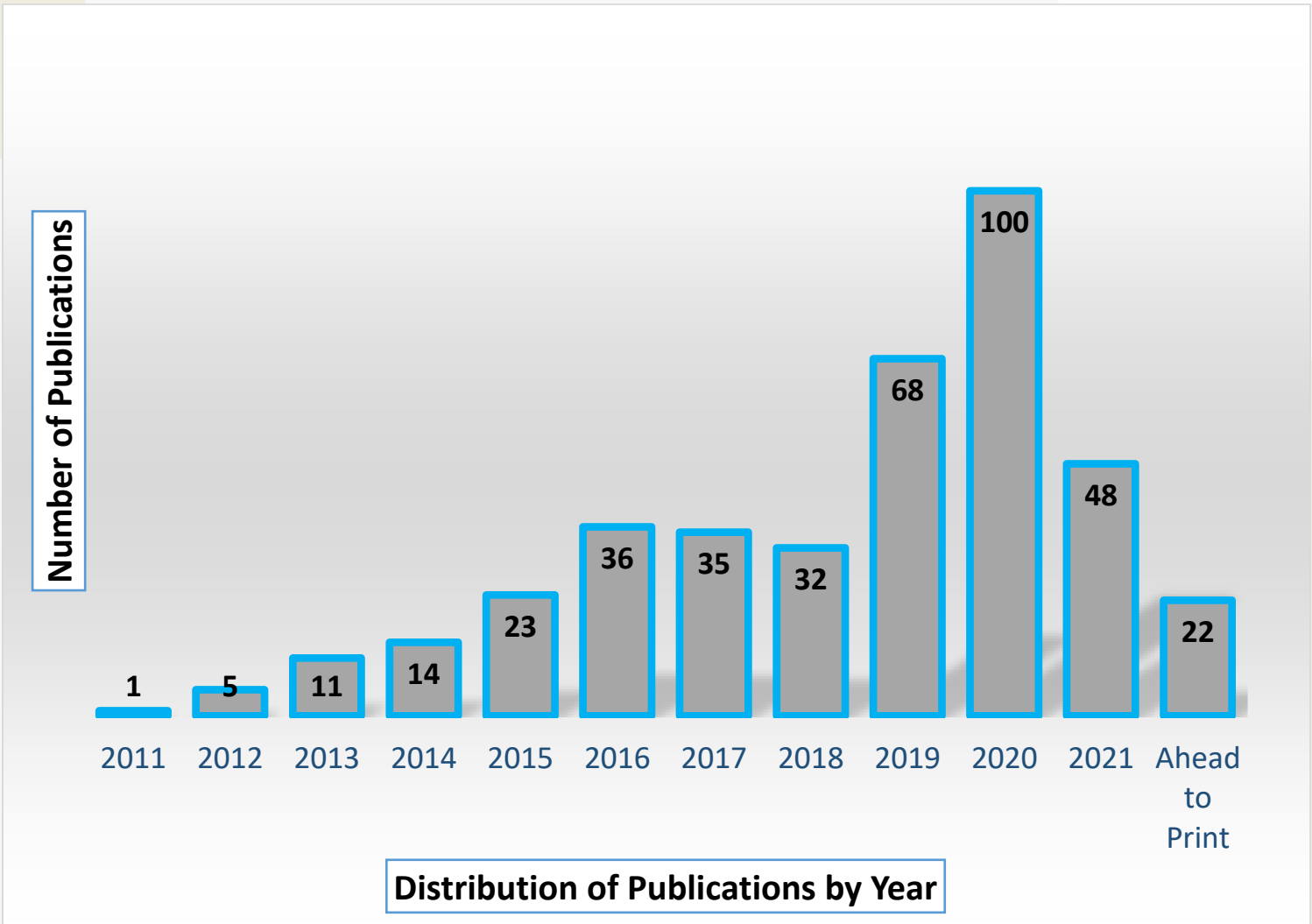
TABLE OF CONTENTS

Serial No.	Description	Page Number
1.	Bibliographic Detail of Publications by Years	5
2.	Subject Index with Abstracts	
2.2	Dental Public Health	42
2.3	Endodontics	95
2.4	Oral Medicine	132
2.5	Oral Pathology	146
2.6	Oral and Maxillofacial Radiology	155
2.7	Oral and Maxillofacial Surgery	165
2.8	Orthodontics	175
2.9	Pediatric Dentistry	192
2.10	Periodontics	200
2.11	Prosthodontics	217
2.12	Restorative Dentistry	232
2.13	Social Sciences	256
3.	Author Index	274

PUBLICATIONS BY YEAR (*n*=395)



Bibliographic Detail of Publications by Years

"Ahead to Print" Publications

1. ***Sahr Al Tuwaijri***. **Biological Outcome and Stress Analysis of Angled Abutment on Implant Supported Single and Partial Denture Prostheses**. The Open Dentistry Journal. Online published 2021 Jan 15, ahead to print.

2. ***Abeer Alshehri, Nasser Alghofaili, Renad ALshunaiber, Lubna Alkadi***. **Quality and Readability Assessment of Internet-Based Information on Common Prosthodontic Treatments**. International Journal of Prosthodontics. Online published Feb 2021, ahead to print.

3. ***Latifa Yousef Algudaibi, Shahad AlMeaigel, Nouf AlQahtani***, Naila A. Shaheen, ***Ali Aboalela***. **Oral and oropharyngeal cancer: Knowledge, attitude and practices among medical and dental practitioners**. Cancer Rep (Hoboken). Online published 3 Mar 2021, ahead of print.

4. ***Hayat Alghutaimel***, X Yang, B Drummond, H Nazzal, M Duggal, E Raïf. **Investigating the vascularisation capacity of a decellularised dental pulp matrix seeded with human dental pulp stem cells: in vitro and preliminary in vivo evaluations**. International Endodontic Journal. Online published on 11 Mar 2021, ahead to print.

5. ***Asma Almazyad, Lama Alabdulaaly,*** Vikki Noonan, Sook-Bin Woo. **Oral Hairy Leukoplakia: A Series of 45 Cases in Immunocompetent Patients**. Oral Surgery, Oral Medicine, Oral Pathology and Oral Radiology. Online published 29 Mar 2021, ahead to print.

6. ***Nadia S. Al-Angari, Atheer S. Aldaham***, Emad Masuadi, ***Muhammad Nadeem, Lubna Alkadi***. **The Effectiveness of Students' Performance in Preclinical Fixed Prosthodontics Course in Predicting Subsequent Clinical Performance**. Journal of Prosthodontics. Online published 12 Apr 2021, ahead to print.

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8. Hamad Alzoman, ***Khalid Alamoud***, Waad K. Alomran, Abdulaziz Almudhi, Naif A. Bindayel. **Changes of Periodontal Tissues Because of Orthodontic Treatment: A Retrospective Study.** Journal of Advanced Oral Research. Online published 4 Apr 2021, 23202068211003416, ahead to print.

9. ***Hatem Alqarni,*** Patti Montgomery, Ruth Aponte-Wesson, Alexander M. Won, Theresa M. Hofstede, Mark S. Chambers. **Combined rehabilitation of a lower lip defect after resection of floor of mouth cancer: A clinical report.** The Journal of Prosthetic Dentistry. Online published 16 Apr 2021, ahead to print.

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11. Keith E. Campagno, Wennan Lu, Assraa Hassan Jassim, ***Farraj Albalawi***, Aurora Cenaj, Huen-Yee Tso, Sophia P. Clark, Sripinun Puttipong, Nestor Mas Gómez, Claire H. Mitchell. **Rapid morphologic and molecular activation of microglial cells by stimulation of the P2X7 2 receptor correlates with increased pressure and neuronal loss**. Research Square. Online published April 2021, ahead to print.

12. Piyush Heda, ***Bassam Alalola,*** Fernanda R. Almeida, Hugh Kim, Bernardo U. Peres, Benjamin T. Pliska. **Long-term periodontal changes associated with oral appliance treatment of obstructive sleep apnea**. Journal of Clinical Sleep Medicine. Online published 14 May 2021, ahead to print.

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16. ***Nadia Al-Angari, Saeed Algarni, Anas Andijani***, Abdulwahab Alqahtani. **Various Classes of Removable Partial Dentures: A Study of Prevalence Among Patients Attending a Dental and Educational Institute in Riyadh, Saudi Arabia**. The Saudi Dental Journal. Online published 29 May 2020, ahead to print.

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2. ***Sanjeev S. Khanagar, Ali Al-Ehaideb***, Parbhadevi C. Maganur, Satish Vishwanathaiah, Shankargouda Patil, Hosam A. Baeshen, Sachin C. Sarode, Shilpa Bhandi. **Developments, application, and performance of artificial intelligence in dentistry–A systematic review**. Journal of Dental Sciences, 2021 Jan;16(1): 508-522.

3. ***Talal S. Alshihayb,*** Elizabeth A. Kaye, Yihong Zhao, Cataldo W. Leone, Brenda Heaton. **A Quantitative Bias Analysis to Assess the Impact of Unmeasured Confounding on Associations between Diabetes and Periodontitis.** Journal of Clinical Periodontology, 2021 Jan;48(1):51-60.

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21. Walaa Magdy Ahmed, ***Bassam Alalola, Mohammed Alsaloum***, Tyler Verhaeghe, James Andrew, Mohamed-Nur Abdallah. **3D Prosthodontic Treatment Planning for Orthodontic Patients: Interdisciplinary Approach**. In: Retrouvey JM., Abdallah MN. (eds) 3D Diagnosis and Treatment Planning in Orthodontics. Springer, Cham. 2021 Mar. (Book Chapter).

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33. Mathew T. Kattadiyil, ***Abdulaziz A. Alzaid***, Stephen D. Campbell. **What Materials and Reproducible Techniques May Be Used in Recording Centric Relation? Best Evidence Consensus Statement.** Journal of Prosthodontics. 2021 Apr;30(S1):34-42.

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2020 Publications

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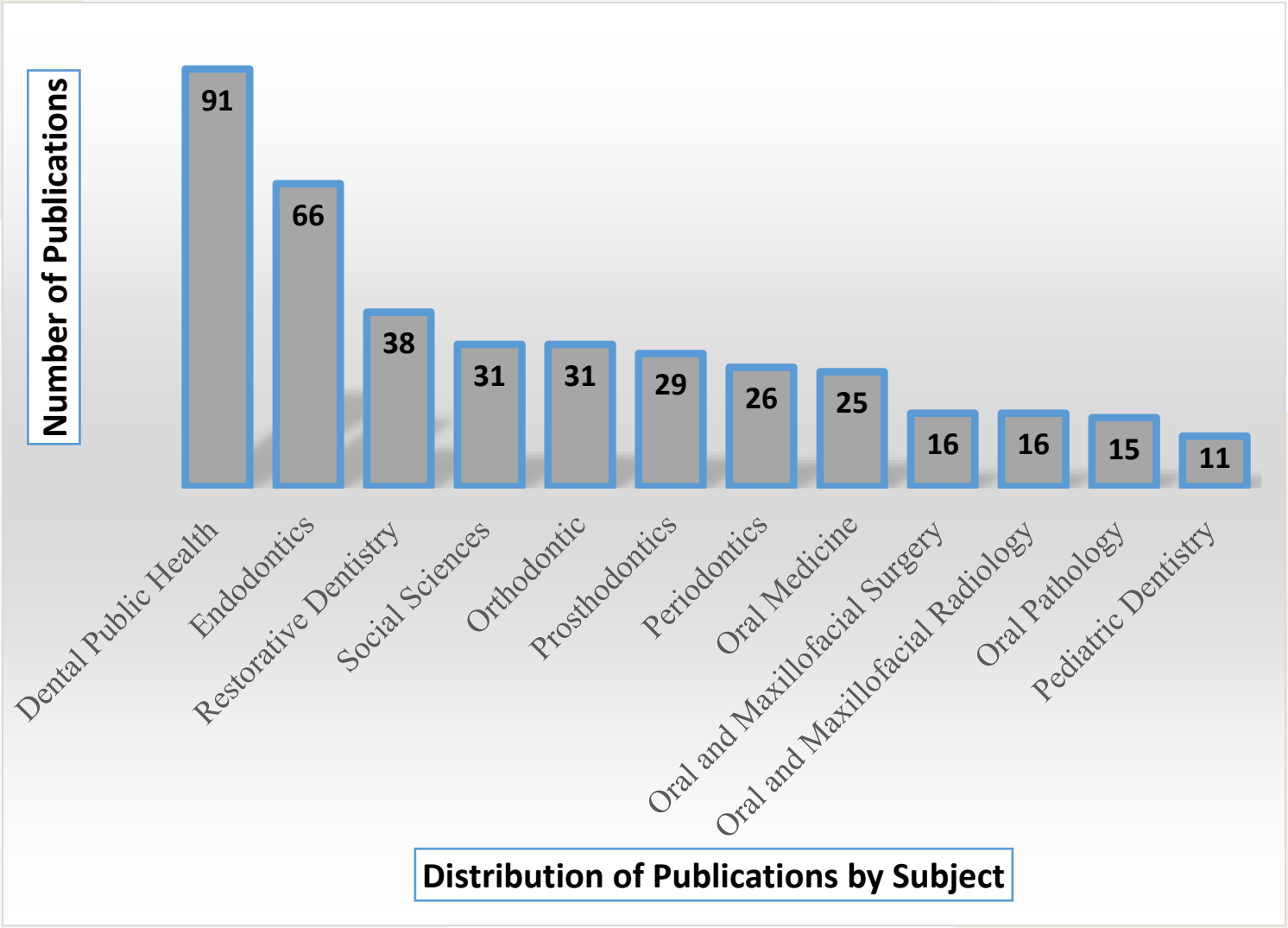

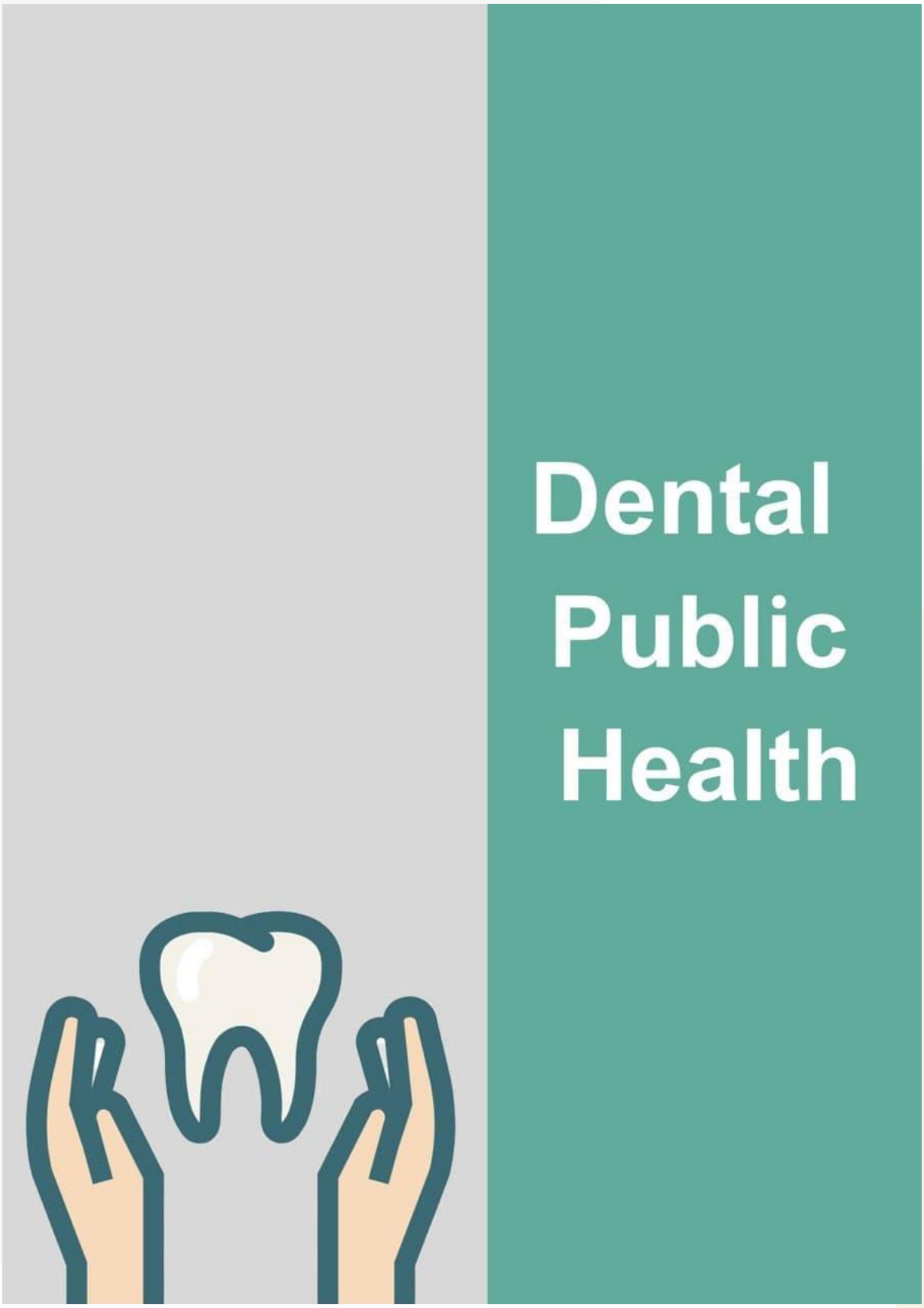
Dental
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Health

2.1 DENTAL PUBLIC HEALTH

Application and Performance of Artificial Intelligence Technology in Oral Cancer Diagnosis and Prediction of Prognosis: A Systematic Review

Sanjeev B. Khanagar, Sachin Naik, Abdulaziz A. Al Kheraif, Satish Vishwanathaiah, Prabhadevi C. Maganur, Yaser Alhazmi, Shazia Mushtaq, Sachin C. Sarode, Gargi S. Sarode, Alessio Zanza, Luca Testarelli, Shankargouda Patil.

Diagnostics, 2021 May 31; 11(6):1004.

Abstract: Oral cancer (OC) is a deadly disease with a high mortality and complex etiology. Artificial intelligence (AI) is one of the outstanding innovations in technology used in dental science. This paper intends to report on the application and performance of AI in diagnosis and predicting the occurrence of OC. In this study, we carried out data search through an electronic search in several renowned databases, which mainly included PubMed, Google Scholar, Scopus, Embase, Cochrane, Web of Science, and the Saudi Digital Library for articles that were published between January 2000 to March 2021. We included 16 articles that met the eligibility criteria and were critically analyzed using QUADAS-2. AI can precisely analyze an enormous dataset of images (fluorescent, hyperspectral, cytology, CT images, etc.) to diagnose OC. AI can accurately predict the occurrence of OC, as compared to conventional methods, by analyzing predisposing factors like age, gender, tobacco habits, and bio-markers. The precision and accuracy of AI in diagnosis as well as predicting the occurrence are higher than the current, existing clinical strategies, as well as conventional statistics like cox regression analysis and logistic regression.

Keywords: artificial intelligence; artificial neural networks; oral cancer diagnosis; machine learning; oral cancer prediction

Trends in dental-related visits to a tertiary hospital emergency department in Saudi Arabia.

Raghad A. Alammar, Nada A. Alsulaiman, Moath A. Alabdullatif, Abdullah M. Alwhaibi, ***Lubna T. Alkadi.***

Saudi Journal of Oral Sciences, 2021 Apr;8(1):33-37.

Introduction: Emergency medicine department visits for odontalgia, related to traumatic and non traumatic dental events has seen a shift towards increase in cases. Emergency departments provide palliative care especially for the non traumatic dental injuries Aims: To explore the trends of emergency department (ED) visits for dental-related conditions in Saudi Arabia. The study also aimed to analyze visit management patterns, including procedures, prescriptions, and recall visits.

Materials and Methods: A cross-sectional retrospective observational study was done using simple random sampling on dental emergency visit data to the ED at hospitals under renowned university of health sciences in Riyadh and Al-Ahsa between January 2016 and May 2019.

Results and Discussion: A total of 5050 charts were included. An increase in dental emergency visits was observed between 2016 and 2017. Pulpal and periapical lesions were the most frequently diagnosed conditions every year (53.83% of all dental-related ED visits), and traumatic injuries were the least frequently (6.37%) diagnosed condition.

Conclusion: Dental-related visits to EDs in Saudi Arabia increased remarkably from 2016 to 2019. Pulpal and periapical conditions were the most frequent cause of dental-related ED visits. To ensure better use of ED time and resources, it is imperative to raise public awareness of what types of urgent dental conditions require an ED visit, as well as to increase the number of public health unit dental clinics and their ease of access.

Keywords: Emergencies, emergency service, hospital, Saudi Arabia, tooth diseases

Teledentistry: The Need of An Hour During Pandemic COVID-19.

Jyoti Prajapat S, Rajesh Prajapat, Sowmya H K, Suman Panda, ***Sanjeev B. Khanagar***, Prabhadevi C. Maganur, Satish Vishwanathaiah.

Indian Journal of Forensic Medicine & Toxicology, Apr-Jun 2021; 15(2):1706-8

Abstract: The epidemic of coronavirus disease 2019 (COVID-19), originating in Wuhan, China, has become a major public health challenge. According to WHO, “It is possible to halt the virus spread, by adopting measures to detect disease early, isolate and treat the cases, tracing the people who came in contact with those who are infected, wearing gloves and masks, limitation of people going outside their home and promote social distancing measures.” Due to the characteristics of dental settings, the risk of cross infection can be high between patients and dental practitioners and can spread from patient to patient. As part of its efforts to mitigate the spread of the COVID-19 pandemic the American Dental Association (ADA) provided essential guidance on (i) emergency vs. nonemergency dental care and (ii) the use of teledentistry. In response to the current health crisis, teledentistry is emerging as a viable care option in an effort to help “flatten the curve” of the COVID-19 pandemic. During the COVID-19 outbreak, teledentistry is an effective way to triage patients and conduct problem-focused evaluations in order to limit office visits to patients needing urgent or emergency care. This article, based on relevant guidelines and research, introduces the essential knowledge about COVID-19, and focuses on how teledentistry can be helpful in preventing dental emergencies by providing effective dental care to patients during quarantine, and also educate and motivate people to opt necessary dental hygiene measures.

Keywords: COVID-19, Teledentistry, Cross infection, Social distancing

Psychological Distress among Undergraduate Dental Students in Saudi Arabia and Its Coping Strategies—A Systematic Review.

Sanjeev B. Khanagar, Ali Al-Ehaideb, Ahmed Jamleh, Khansa Ababneh, Pradhadevei C. Maganur, Satish Vishwanathaiah, ***Mohammed Adel Awawdeh,*** Sachin Naik, Abdulaziz A. Al-Kheraif, Shilpa Bhandi, Alessio Zanza, Luca Testarelli, Shankargouda Patil.

Healthcare, 2021 Apr; 9(4):429.

Abstract: The objective of this paper was to evaluate the studies that have reported on psychological issues among dental students in Saudi Arabia and to develop coping strategies to overcome these mental health-related issues. The present systematic review is in accordance with the guidelines for Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA). The search for the articles was carried out in the electronic databases by four independent researchers. The data search was performed in the electronic search engines like PubMed, Google Scholar, Web of Science, Scopus, Medline, Embase, Cochrane and Saudi Digital Library for scientific research articles published from January 2000 until December 2020. STROBE guidelines were adopted for qualitative analysis of six articles which met the eligibility criteria. The analysis of the literature revealed that most of the studies included were conducted

in the past 8 years in different regions of Saudi Arabia. Findings of this systematic review clearly state that dental students in Saudi Arabia experience higher levels of depression, stress and anxiety and stress during their education period, with a higher stress for female students compared to male students. There is an urgent need to introduce interventional programs and preventive strategies to overcome the long-term effects.

Keywords: anxiety; dental students; depression; psychological distress; Saudi Arabia; stress

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

Sanjeev B. Khanagar, Razan Aldhibi, Sara Alkattab, Lama Alosail, Huda Alaqail, Afrah Almotairi, Rahaf Almikhem.

Indo American Journal of Pharmaceutical Science, 2021 Mar;8(3): 256-67.

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

Method 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 female. 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 patient and/or parent 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 to improve the management that a dentist can provide for ED patients.

Keywords: Eating disorders, Dentists, Knowledge, Attitude

Oral and oropharyngeal cancer: Knowledge, attitude and practices among medical and dental practitioners.

Latifa Yousef Algudaibi, Shahad AlMeaigel, Nouf AlQahtani, Naila A. Shaheen, ***Ali Aboalela***.

Cancer Rep (Hoboken). Online published 3 Mar 2021, ahead of print.

Background: Oral and oropharyngeal cancer are significant health problems. They are both life-threatening conditions usually diagnosed at an advanced stage causing survival rates to decline.

Aim: To assess and compare practices, knowledge and attitude regarding oral and oropharyngeal cancer between dental and medical practitioners.

Methods: A cross-sectional study was conducted to assess knowledge, attitude and practices of oral and oropharyngeal cancer among dental and medical practitioners at King Abdulaziz Medical City, Riyadh, Saudi Arabia. 360 participants were included in the study using a convenient sampling technique. Participants were approached in their clinics and printed self-administered questionnaire were handed over to them after signing a written consent form. Frequency distribution and Chi-Square test were used for the statistical analysis and the level of significance was set at P value of .05 or less.

Results: A total of 174 participants responded. Assessment of oral and oropharyngeal cancer knowledge between dental practitioners and medical practitioners showed comparable results. Regarding practices, a significant difference was seen between medical practitioners and dental practitioners in determining the duration of intra-oral ulcer to consider urgent referral (P = .006) and in number of referrals made in relation to suspicious oral lesions (P = .002). Moreover, a significant difference (P = .006) was seen between medical practitioners and dental practitioners in determining the duration of intra-oral ulcer to consider urgent referral.

Conclusion: Medical and dental practitioners showed areas of differences in practice, attitude and knowledge of oral and oropharyngeal cancer that when addressed would lead to improved survival rates.

Keywords: attitude; dental practitioners; knowledge; medical practitioners; oral cancer; oropharyngeal cancer; practice.

Developments, application, and performance of artificial intelligence in dentistry–A systematic review

Sanjeev S. Khanagar, Ali Al-Ehaideb, Parbhadevi C. Maganur, Satish Vishwanathaiah, Shankargouda Patil, Hosam A. Baeshen, Sachin C. Sarode, Shilpa Bhandi

Journal of Dental Sciences, 2021 Jan;16(1): 508-522.

Background/purpose: Artificial intelligence (AI) has made deep inroads into dentistry in the last few years. The aim of this systematic review was to identify the development of AI applications that are widely employed in dentistry and evaluate their performance in terms of diagnosis, clinical decision-making, and predicting the prognosis of the treatment.

Materials and methods: The literature for this paper was identified and selected by performing a thorough search in the electronic data bases like PubMed, Medline, Embase, Cochrane, Google scholar, Scopus, Web of science, and Saudi digital library published over the past two decades (January 2000–March 15, 2020). After applying inclusion and exclusion criteria, 43 articles were read in full and critically analyzed. Quality analysis was performed using QUADAS-2.

Results: AI technologies are widely implemented in a wide range of dentistry specialties. Most of the documented work is focused on AI models that rely on convolutional neural networks (CNNs) and artificial neural networks (ANNs). These AI models have been used in detection and diagnosis of dental caries, vertical root fractures, apical lesions, salivary gland diseases, maxillary sinusitis, maxillofacial cysts, cervical lymph nodes metastasis, osteoporosis, cancerous lesions, alveolar bone loss, predicting orthodontic extractions, need for orthodontic treatments, cephalometric analysis, age and gender determination.

Conclusion: These studies indicate that the performance of an AI based automated system is excellent. They mimic the precision and accuracy of trained specialists, in some studies it was found that these systems were even able to outmatch dental specialists in terms of performance and accuracy.

Keywords: Artificial intelligence dentistry; Machine learning; Computer-aided diagnosis; Deep learning models; Convolutional neural networks; Artificial neural networks

Oral Health Knowledge, Behaviour, and Access to Dental Care in Visually Impaired Individuals in Jordan: A Case-Control Study

Sabha Alshatrat, Isra AL Bakri, ***Wael AL Omari***, Abedelmalek Tabnjh

The Open Dentistry Journal, 2021 Feb; 15:33-40.

Aim: The study aimed to assess oral health knowledge, dental behaviors, and use of dental services in individuals with vision impairment in Jordan and identify barriers that affect their access to dental care in comparison with individuals without vision impairment.

Materials and Methods: A case-control study was carried out among 399 parents/caregivers of individuals with vision impairment and individuals without vision impairment, which involved the completion of a self-designed questionnaire. A closed-ended, validated self-designed questionnaire was distributed. The questionnaire included questions addressing participants' oral health knowledge, oral health behaviour, dental service use and barriers to accessing dental care. Data were analyzed using SPSS® software Version 22 with a 0.05 level of significance. A Chi-square test and contingency-table analysis were performed on the data.

Results: Individuals with vision impairment in Jordan were significantly less knowledgeable about different oral health aspects than sighted counterparts. In addition, individuals with vision impairment used toothbrush, dental floss, and mouth rinse less frequently. They also visited dentists less regularly and mostly when only feeling pain. Limited access to dental services was observed among individuals with vision impairment compared to sighted individuals. Barriers, including embarrassment (22%), lack of knowledge of how to treat people with disabilities among dentists (12.5%), and inadequate facilities (13.7%), were significantly ($P<0.05$) more likely to be reported by visually impaired participants than the controls.

Conclusion: Visually impaired individuals and their families should be given appropriate education about oral health care by oral health professionals to reduce the risk of having dental problems and oral disease and enhance their quality of life. Furthermore, recognizing the challenges in accessing dental care for this population could help oral health professionals to minimize these difficulties.

Keywords: Oral health knowledge, Vision impairment, Access to care, Chi-square test, Self-designed questionnaire, Cronbach's alpha.

Association between Dental Caries and Body Mass Index in 8-12-year-Old School Children

Adel Alotaibi, ***Abdulaziz Alzaid***, Khalid Alenezi, Sukumaran Anil

International Journal of Dentistry and Oral Science, 2021 Jan;8(1):1030-1034.

Objective: The objective of this study was to identify the prevalence of dental caries among children aged 8-12-years and to correlate it with the body mass index.

Methods: A cross sectional study was conducted in Riyadh, Saudi Arabia. A total of 562 school children between the age of 8-12 years were selected from 3 schools. One examiner conducted the clinical examination using World Health Organization (WHO) criteria to diagnose dental caries. The body mass index (BMI) was also recorded.

Results: A high prevalence dental caries was observed among Overweight and obese children compared to normal weight children.

Conclusion: The results showed an association between Body mass index and dental caries in children. A higher prevalence of dental caries was experienced among Overweight and Obese children.

Keywords: Dental Caries; Obesity; Children; Epidemiology; Deft; DMFT; Overweight; Body Mass Index.

Application and performance of artificial intelligence technology in forensic odontology-A systematic review

Sanjeev S. Khanagar, Satish Vishwanathaiah, Sachin Naik, Abdulaziz A. Al Kheraif, Darshan Devang Divakar, Sachin C. Sarode, Shilpa Bhandi, Shankargouda Patil

Legal Medicine, 2021 Feb; 48: 101826.

Abstract: Forensic odontology (FO) mainly deals with the identification of the individual through the remains, which mainly includes teeth and jawbones. Artificial intelligence (AI) technology has proven to be a breakthrough in providing reliable information in decision making in forensic sciences. This systematic review aimed to report on the application and performance of AI technology in FO. The data was gathered through searching for the articles in the renowned search engines, which have been published between January 2000 - June 2020. QUADAS-2 was adopted for the risk of bias analysis of the included studies. AI technology has been widely applied in FO for identifying bite-marks, predicting mandibular morphology, gender determination, and age estimation. Most of these AI models are based on either artificial neural networks (ANNs) or convolutional neural networks (CNNs). The results of the studies are promising. Studies have reported that these models display accuracy and precision equivalent to that of the trained examiners. These models can be promising tools when identifying victims of mass disasters and as an additive aid in medico-legal situations.

Keywords: Artificial intelligence; Artificial neural networks; Convolutional neural networks; Deep learning; Forensic odontology; Forensic dentistry; Machine learning

Oral health status among medically compromised children within Riyadh, Saudi Arabia: a case-control study.

Bahija Basheer, Hala Nasser Alarifi, Ghadah Khalid Alharbi, Azhar Sulaiman Alanazi, Norah Rasheed Alshammari, Wafa Mohammed Almutairi, Ibtisam Awwadh Alshalawi.

International Journal of Medicine in Developing Countries 2021 Feb;5(2):439-445.

Background: The perceived need for dental care for children with special healthcare needs (SHCN) exceeds the need for either preventive or specialty medical care. The current study aimed to assess the oral health status among hospitalized and non-hospitalized children with SHCN in Riyadh, Kingdom of Saudi Arabia.

Methodology: This case-control study assessed the oral health status in SHCN children by measuring the prevalence of sum of the number of decayed, missing, and filled permanent teeth, def, gingival index, plaque index, and oral lesions, and related it to hospitalization. The sample size was 300 participants, aged 2-18 years old, who were divided into 150 hospitalized children and 150 non-hospitalized children from several governmental and private hospitals in Riyadh. Oral examination was conducted after receiving consent from the legal guardians who were interviewed using the self-administered 28-item questionnaire assessing demographics, hospitalization characteristics, oral hygiene practices, dental

visits, dietary behaviors, medical conditions, medication use, and self-reported recurrent aphthous stomatitis. Chi-squared test was used to compare the incidence of dental diseases, periodontal diseases, and oral lesions to hospitalization.

Results: Caries was more prevalent in the controls (non-hospitalized) than in hospitalized cases (uncontrolled). Moderate gingivitis was more prevalent in hospitalized cases; however, mild gingivitis was more prevalent in controls. Plaque scores were found to be better in hospitalized cases than controls.

Conclusion: The prevalence of dental caries and plaque accumulation was significantly poorer in non-hospitalized children when compared to hospitalized patients, and gingival health was more deteriorated in hospitalized children in Riyadh city.

Keywords: Oral health, children, hospitalized, caries prevalence, gingival index, plaque index.

Dental Education in the COVID-19 Era: Challenges, Solutions and Opportunities

Lubna Alkadi

The Open Dentistry Journal, 2021 Feb; 15:17-24.

Objective: The COVID-19 crisis has caused considerable disruption to medical education and has stimulated creative and rapid changes in the way technology is adopted and utilized for education. This change is accompanied by many challenges related to education, patient care, research, faculty development and collaboration, finances, and the psychological well-being of stakeholders.

Methods: A review of the literature on dental education during the COVID-19 pandemic was conducted. Published articles addressing the challenges, solutions and opportunities in dental education during the COVID-19 era were assessed.

Results: COVID-19 was a catalyst for a significant amount of change in dental education. Despite the magnitude of the challenges, this pandemic has influenced many positive solutions and opportunities in dental education.

Conclusion: The COVID-19 pandemic forced dental educators to rethink models of curricular delivery, as it disrupted traditional delivery methods. The use of technology was adapted to ensure the continuity of education. With that, a number of challenges surfaced that were tackled creatively. Reflecting over the whole experience with COVID-19, the multiple opportunities that have been identified can improve the way we educate our students in the future.

Keywords: COVID-19, Dental Education, Curriculum, Dentistry, SARS-CoV-2, Dental colleges.

Oral health knowledge and dental behavior among individuals with autism in Jordan: a case-control study.

Sabha Mahmoud Alshatrat, Isra Abdelkarim Al-Bakri, ***Wael Mousa Al-Omari***, Noor Abdullah Al Mortadi

BMC Oral Health. 2021 Feb;21(1):62.

Background: Oral care is acknowledged as an integral component of general health and plays an essential role in establishing the desired level of quality of life for individuals with autism spectrum disorder (ASD).

Purpose: To investigate oral health knowledge and dental behaviors in individuals with ASD in comparison with individuals without ASD in Jordan.

Methods: A case–control study was carried out among 296 caregivers of individuals with ASD (n = 147) and control (n = 149) groups. A closed ended, validated self-designed questionnaire was distributed. The questionnaire included questions addressing participant's oral health knowledge and behaviour. Data were analyzed using SPSS® software Version 22 with a 0.05 level of significance. A Chi-square test and contingency-table analysis were performed.

Results: Individuals with ASD in Jordan were significantly less knowledgeable about different oral health aspects than individuals without ASD ($p < 0.05$). Fewer individuals in the ASD group brushed their teeth once or twice daily (89%), compared to the control group (93%). Only 15% of the ASD participants could brush their teeth without help. The use of fluoridated toothpaste and the frequency of using mouth rinse demonstrated a significant difference between groups ($p < 0.05$).

Conclusion: ASD individuals in Jordan suffer from a significant lack of oral knowledge comparing to their controls, leading to a misunderstanding of the basic and highly important dental health aspects. Indicating that the knowledge was not enough to influence their dental behaviors. Children with ASD and their families should receive appropriate education in special need oral health care given by oral health professionals to reduce the risk of having dental problems and oral disease and enhance their quality of life.

Keywords: Oral care, Dental behavior, Oral health knowledge, Autism spectrum disorder (ASD)

Exposure Risks and Preventive Strategies Considered in Dental Care Settings to Combat Coronavirus Disease (COVID-19)

Sanjeev B. Khanagar, Ali Al-Ehaideb, Satish Vishwannathaiah, Prabhadevi C. Maganur, Sachin Naik, ***Salman Siddeeqh***.

Health Environments Research & Design Journal, 2021 Mar;14(1): 278-289.

Abstract: In recent times, numerous scientific articles have been published on the risks of exposure to infectious microorganisms in dental care settings. The main mode of transmission of such infectious organisms is primarily through bioaerosols generated during routine dental procedures which put both dental care providers and their patients at an increased risk of exposure. Other frequent modes of infection transmission often reported include cross contamination and inadequate adoption of infection control protocols. The main objective of this article is to highlight the findings of those studies that have reported on the routes and modes of transmission of infectious organisms in dental settings, to report possibilities of cross contamination in dental care settings, and also to report any breach in adherence to infection control protocols in dental care settings. We also intend to emphasize on standard infection control protocols and strategies that need to be considered in dental care settings during disease outbreaks like coronavirus disease (COVID-19).

Keywords: exposure risks, risk factors, cross contamination, preventive strategies, disease outbreak, dental care settings and coronavirus disease

Psychologic stress and burnout among dental staff: A cross-sectional survey.

Abdullah Mohammed Alzahem, Yasmeen Abdulhadi Alhaizan, ***Latifa Yousef Algudaibi,*** Regad Mohammed Albani, Abdulrahman Majed Aljuraisi, Meshal Khaled Alaqeel.

Imam Journal of Applied Sciences, 2020;5(1):9-15.

Background: Professional burnout, a prolonged response to stress, may affect standards of patient care. Burnout is defined as emotional exhaustion (EE), depersonalization, and diminished personal accomplishment (PA).

Aim: The aim of the current study is to identify and compare the psychologic stress and burnout levels among different job titles and specialties in the dental services department. We also examined the effects of marital status, age, and sex on stress and burnout levels.

Settings and Design: A cross-sectional study conducted in the department of dental services at a tertiary medical complex.

Materials and Methods: A convenient sampling approach was used to distribute the questionnaire in the dental services department (*n* = 177, response rate = 88.5%). Two-validated questionnaires, the Psychological Stress Measure-9, and Maslach Burnout Inventory–Human Services Survey, were used.

Statistical Analysis: SAS 9.4 (SAS Institute Inc., Cary, NC, USA) was used for data analysis. *P*<0.05 was considered statically significant.

Results: The mean (± standard deviation) stress level was 32.6 (±11.43), with the highest stress levels seen in consultants and residents (39.17% and 38.33%, respectively). Hygienists and technicians exhibited the highest lack of PA (24.53%), consultants exhibited the highest EE (24.64%), and residents exhibited the highest impersonal response toward patients (26.67%).

Conclusion: Participants with the job title “Consultant” or “Resident” are the most stressed and burnt-out dental personnel. Specialty, sex, age, and marital status were not identified as risk factors for stress and burnout in our study. Stress and burnout should be reduced to maintain standards of patient care.

Keywords: Burnout, dental staff, dentistry, dentists, psychologic stress

Impact of malocclusion on oral health related quality of life of 11-14-year-old children.

Amrita Geevarghese, Jagan Baskaradoss, ***Waad Alsaadi, Hoda Alemam, Amjad Alghaihab, Amal Almutire, Abeer Almethen.***

BMC Oral Health. Online published 27 Jan 2020, ahead of print.

Background: This study investigates the impact of malocclusion on the oral health-related quality of life (OHRQoL) of 11-14-year-old children.

Methods: This cross-sectional study was conducted among 250 caregiver/child (11-14-year-olds) dyads seeking orthodontic consultation at the orthodontic center at King Abdulaziz Medical City (KAMC), Riyadh, Saudi Arabia. Oral health related quality of life (OHRQoL) was assessed using child perception questionnaire 11-14 (CPQ 11–14) and the Dental Aesthetic Index (DAI) was used to assess severity of malocclusion. CPQ 11–14 scores ranged from 0 to 64, with lower scores representing a better quality of life. Multivariate analysis of variance (MANOVA) was used to assess differences between domain and total CPQ 11–14 scores with the co-variates.

Results: The mean CPQ 11–14 score was 19.89±9.8. Mean scores for the global rating, oral symptoms, functional limitations, emotional well-being, and social well-being domains were 4.91±2.15, 5.26±3.22,

3.67±3.58, 3.98±3.89 and 2.08±2.98, respectively. The distribution of subjects across the four severity categories was minor/none – 37%, definite – 22%, severe – 15% and very severe 24%. The overall and domain-specific scores of CPQ 11–14 varied across the different categories of malocclusion. In the comparisons by pairs, it was found that children with very severe malocclusion had significantly higher scores for the social well-being domain and global rating of oral health as compared to children with no/minor malocclusion ($p<0.05$).

Conclusion: Substantial variability in the well-being domain of CPQ 11–14 was observed among children with no/minor malocclusions as compared to children with severe malocclusions.

Keywords: Dental, Malocclusion, Quality of Life

Prevalence of dental fear among male students studying in National Guard schools in Riyadh: A cross-sectional study.

Abed Al-Hadi Hamasha, Raken B. Aldosari, Ziyad M. Osamie, Mohammed M. Aldosari, Abdulaziz H. Fakih, Abdullah M. Alonazi.

Saudi Journal of Oral Sciences, 2020 Jan-Apr;7(1):24-28.

Aims: The aim of the study is to measure the prevalence and factors associated with dental fear among National Guard male middle schools' students.

Subjects and Methods: A cross-sectional analytical study was conducted among 468 students aged 10–17 years. The assessment tool of this study was a self-reported questionnaire filled by students or their legal guardians. The questionnaire included 33 questions; including students' demographics and experience in dental fear. Furthermore, questions related to the most frightening factors as well as factors that make students feel better in dental clinics. Data analysis was conducted using SPSS software. Frequency distributions with numbers and percentages of demographics, frightening factors, and comforting factors were conducted**.**

Results: The response rate was 87%. Dental fear was reported by 29.1% of the sample. Tooth extraction was feared the most (49%) followed by root canal treatment (16%). The main sources of fear were related to dental procedures and noise from drilling teeth. The fear was originated from children own experience (41%) and only 13% relate their fear to what they heard from other people's experience. Variables reduced fear were female dentists (73%), the good reputation of the dentist (55%), and elegance and cleanness of the clinic (47%). The good appearance and neatness of the dentist, attitude of the receptionist, and decreased waiting time were not major factors in reducing dental fear.

Conclusion: Dental fear was present in 29% of schoolchildren and was mostly related to tooth extractions and drilling noise. Dentist's explanation of the dental procedure and her attitudes were reported as helping factors in reducing dental fear.

Keywords: Dental, fear, guards, national, prevalence, students

Dentists' willingness to report suspected violence cases in Saudi Arabia.

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Journal of International Society of Preventive and Community Dentistry, 2020 Apr;10(2): 220-225.

Background and Aim: Violence is a life-threatening issue that mainly affects head and neck areas. Dentist might be the first person to notice this type of injury. This study aimed to investigate dentists' willingness to report suspected violence exposure of their patients and factors associated with their willingness.

Materials and Methods: In a cross-sectional study of 363 dentists in Riyadh, Saudi Arabia, a previously validated self-administered questionnaire was distributed, in both printed and electronic forms (Google Forms), to collect data on personal characteristics, professional background, and negative perception and professional attitude toward reporting suspected violence. Descriptive and analytic statistics were applied. Significance was considered at $P \leq 0.05$.

Results: The majority of dentists reported positive perception (88.4%) and positive attitude (68.0%) toward reporting suspected violence, with percentage mean scores of 35.2 ± 19.6 and 83.5 ± 15.0, respectively. Higher professional attitude score was significantly associated with the ability of dentists to recognize signs of violence ($t = 3.19$, $P = 0.002$). Negative perception mean scores were significantly higher with non-Saudi nationality ($t = 2.03$, $P = 0.043$), private sector ($F = 3.33$, $P = 0.037$), no training on abuse management ($t = 3.02$, $P = 0.003$), and perceived ability to identify victims of violence ($t = 2.61$, $P = 0.01$). After adjusting for potential confounders, negative perception was predicted by non-Saudi nationality ($P = 0.028$) and no history of previous training in abuse management ($P = 0.004$).

Conclusion: Almost all dentists have high professional attitude scores and low negative perception scores toward reporting violence, which reflect a good sense of responsibility toward their patients and community. Educational training in abuse management must be a requirement for dental practice.
Keywords: Dentists, negative perception, professional attitude, reporting violence, willingness

Primordial-level Preventive Measures for Dental Care Providers against Life-threatening Corona Virus Disease (COVID-19).

Sanjeev B. Khanagar, Ali Al-Ehaideb, Sachin Naik, Satish Vishwananthaiah, Prabhadevi Maganur, Nikhil Marwah.

International Journal of Clinical Pediatric Dentistry, 2020 Apr;13(2):176-179.

Abstract: The outbreak of this corona virus disease 19 (COVID-19) was first reported in Wuhan city in China and now it has become a global issue. The total number of confirmed cases of COVID-19 recorded globally has surpassed 100,000. The mode of transmission of COVID-19 is usually from person to person and it could also be through direct transmission such as cough, sneeze, and inhalation of droplets. Dental care providers are at higher risk since they are more prone to cross contamination with the patient's saliva and aerosols that are released during the dental procedures. They can also be transmitted through other routes such as direct contact with blood, oral fluids, and from contaminated instruments. This paper intends to provide primordial-level preventive measures for dental care providers against this life-threatening COVID-19.

Keywords: Corona virus, Dental care providers, Preventive measures, Primordial prevention

Depression, Anxiety, and Psychological Distress among Health-care Providers During the Outbreak of the Life-threatening Coronavirus Disease (COVID-19).

Sanjeev B. Khanagar, Ali Al-Ehaideb, Satish Vishwanathaiah, Prabhadevi C. Maganur, Saranya Varadarajan, Shankaragouda Patil.

The Journal of Contemporary Dental Practice, 2020 May;21(5):471-472.

Published without Abstract

Relationship between distance and transportation with attendance of dental appointments in MNGHA and KSAU-HS

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Medical Science, 2020; 24(102):765-770.

Abstract: The aim of this study is to know is distance to the KSAU-HS dental clinic and MNG-HA dental clinics a barrier to attend follow-up appointments. Also, to see what the other barriers are to affect the attendance of the patients like cost of transportation and the time of the appointments, morning or afternoon. The sample size was 550 participants in the KSAU-HS and MNG-HA waiting areas, in Riyadh, Saudi Arabia. A questionnaire made with the course instructors trying to fulfill the aim and to see the other barriers. Albarakati et al. found that women are more affected to miss appointment, and the holy Ramadan is a major effect of not attending, due to fasting. The main variable is do you think that the availability of transportation will affect the attendance of follow-up appointments. Using SPSS, we do most of the analysis with those who answer the main variable with "No". Surprisingly, the patients whom lived in areas not that near are better to attend than those who in nearby areas with a p-value of 0.035. And the cost of transportation is not a barrier to attend follow-up appointments. Recommendations to the next researchers to include more question about barriers of attending appointments, to shorten the questionnaire, and lastly to reduce “Neutral” options as it is the first choice for the patients to consider. The importance of attending follow-up appointments is not a part of our culture which is getting less day by day.

Keywords: dental clinic, fasting, transportation, questionnaire

Influence of the Knowledge and Practices on Dental Students Career Choices of Specialty in Saudi Arabia

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Dental Research and Management, 2020;4(1):14-22.

Introduction: The dental profession plays a significant role in the service of the society. The selection of dentistry as a career as well as choosing specialty and continuing Postgraduate Dental Education (PGE) is a critical decision in an individual's life, affecting one's social and economic status. The aim of this study is to obtain empirical evidence on views on dental specialty choice and along with the investigation of the influencing and motivating factors that inspire them in choosing a dental specialty.

Methodology: A cross sectional survey was conducted through an online-based questionnaire, distributed on social media to recruit participants including 600 dental students and graduates from different universities in Riyadh, Saudi Arabia with convenience sampling technique to recruit participants from Twitter while cluster simple random technique in targeted colleges. For data management and analysis, SPSS version 16 was used. The arithmetic mean and standard deviation was calculated for quantitative

data, chi-square and the Fischer Exact test were used to compare categorical data. The Mann-Whitney test, Kruskal-Wallis test, student`s t-test and ANOVA test were used to as tests of significance for comparing numerical data.

Results: Our study shows that majority of the students decided on their own when choosing their career in dentistry and many of them are interested in pursuing international post-graduation programs. Personal preferences in PGE was oral maxillofacial surgery males as well as in females followed by pediatric surgery, females while Orthodontic, dentofacial orthopedics, restorative and cosmetic surgery in males. The most desired working environment preference was civilian dentist in public sector. The most common influencing factors in decision making for dental career were salary aspects and cost of living expenses. Moreover, the most important motives for dental PGE included encouragement by family, friends, teachers, counselors, and good experience with dentists, job security, earning money, flexible working hours, time for family and availability of jobs.

Conclusion: Postgraduate dental education programs for specialization in dentistry to get either clinical specialty certification or higher academic degrees nationally or internationally should be developed on a planned basis by giving appropriate value to the influencing and motivating factors identified in order to enhance professional development and PGE in dentistry.

Keywords: Postgraduate dental education, Dental students, Oral maxillofacial surgery, Influencing factors

Public Attitude and Awareness Towards their Teeth Color and Dental Bleaching in Saudi Arabia: A Cross-Sectional Survey

Nora Al-Nomay

Journal of Public Health and Epidemiology, 2016 Apr;8(4):45-52.

Abstract: Advances in restorative dentistry have made many tooth whitening techniques economical and cost effective both in developed and developing countries. The purpose of this study was to evaluate the attitude and awareness of tooth bleaching among a sample of adults attending shopping malls in Riyadh city, Saudi Arabia.

A cross sectional survey was performed in four major malls located in different regions of Riyadh city in Saudi Arabia. A total of 520 adult visitors were randomly selected to participate in this study. In addition, 82 dentists were requested to participate in the study. Knowledge and attitude toward teeth color and dental bleaching were assessed by using self-administered and pretested questionnaire. Descriptive statistics were carried out to express participant's socio-demographic information. Multivariate logistic regression analysis (using enter method) and chi-square tests were used to identify independent predictors of positive attitudes toward dental bleaching.

A total of 55.8% of male and 44.2% female responded to the questionnaire. Among all the respondents 67.4% were not satisfied with their tooth color and 77.7% were willing to undergo tooth whitening procedure. Females showed more positive attitude towards tooth bleaching (odd ratio (OR) 1.9, 95% confidence interval (CI): 1.181-3.166). Participants rated with having excellent, good and fair knowledge exhibited positive attitude toward tooth bleaching compared to participants with poor knowledge (OR: 8.4, 3.4, and 2.0; 95% CIs: 3.31-21.18, 1.81-6.36, and 1.08-3.76).

The results depict that majority of the study participants were not satisfied with their tooth color and were willing to undergo tooth whitening procedures. Additionally, gender differences were observed with regards

to the attitude towards bleaching. Moreover, participants who had the knowledge of tooth color showed more positive attitude towards tooth bleaching.

Keywords: Attitude, awareness, perception, tooth bleaching, teeth color.

Dental Services Utilization and Barriers to Dental Care for Individuals with Autism Spectrum Disorder in Jordan: A Case-Control Study

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International Journal of Dentistry, 2020 Aug; 2020:3035463.

Abstract: Individuals with disabilities are at higher risk for oral diseases such as caries and periodontal disease. Therefore, regular dental care is essential to maintain oral health. However, individuals with disabilities encounter difficulties in accessing dental care. The challenges and barriers to oral care faced by individuals with autism spectrum disorder (ASD) have not been addressed in Jordan. The aim of this study was to examine the use of dental services in individuals with ASD in Jordan and identify barriers that affect their access to dental care in comparison with individuals without ASD. A case-control study was carried out among 296 parents/caregivers of individuals with ASD and individuals without ASD, which involved completion of a self-designed questionnaire. The majority of the participants in both groups had visited the dentist in the year preceding completion of the questionnaire. The main reason for visiting dental services was toothache (43%), and the least common reason was routine checkup (11.6%), with a significant difference ($P < 0.05$) observed between the two groups. Barriers including embarrassment (43.5%), a lack of specialized dental staff (28.6%), a lack of knowledge of how to treat people with disabilities (26.6%), and inadequate facilities (34%) were significantly ($P < 0.05$) more likely to be reported by individuals with ASD than the controls. In conclusion, knowing and understanding the barriers to accessing dental care could improve overall health for individuals with ASD. Furthermore, recognizing the challenges in accessing dental care for this population could help oral health professionals to minimize these difficulties.

Quality of Life and Stress Level Among Health Professions Students.

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Health Professions Education, 2020 Jun; 6(2):201-210.

Purpose: Numerous studies have shown that students of health professions report higher perceived stress and lower quality of life (QOL) levels than those in other disciplines. The purpose of this cross-sectional survey study is to assess variations in students' QOL and perceived stress levels by demographic and college-related factors.

Methods: The World Health Organization QOL (WHOQOL) – BREF and Perceived Stress Scale (PSS-14) were used to assess QOL and stress levels among students at King Saud Bin Abdul-Aziz University for Health Sciences (KSAU-HS), Riyadh, during December 2015–June 2016. The WHOQOL-BREF comprises four broad QOL domains: physical health, psychological health, social relationships and environment. A total score from responses to the 14 questions in the PSS was computed. Univariate statistical analyses were performed using the Chi-square/Fisher's exact test or the t-test/Mann-Whitney U test, as appropriate. Linear regression models were used to examine the independent effect of numerous demographic and college-related factors on QOL and PSS.

Results: A total of 479 students completed the questionnaire, representing a response rate of 95%. Fifty nine percent of the respondents were females. Then vast majority of respondents were single (96%) and reported a household income of SAR 10,000 or higher (82%). The distribution of college enrollment was as follows: Medicine 37%, Applied Medical Sciences 18%, Nursing 16%, Dentistry 13% and Pharmacy 14%. Scores in a number of QOL domains were significantly different by gender, household income, college, academic level and smoking status. Scores in all four QOL domains were negatively correlated with PSS, indicating that better QOL is strongly and highly significantly related to lower perceived stress levels with correlations ranging from −0.27 to −0.58 ($p < 0.001$). PSS scores were independently and significantly associated with QOL scores in the physical and psychological health domains.

Conclusions: Most students that participated in this study appeared to acknowledge challenges in various aspects of their QOL which have been shown to be associated with their perceived stress. Further studies are needed to evaluate the effect of implementing educational and counseling programs to improve QOL and reduce stress levels among health sciences students.

Keywords: Quality of life, Perceived stress, Health professions students

Willingness and Perception of Dental Interns towards Working in Rural Areas in Riyadh, Saudi Arabia- A Cross-sectional Study.

Sanjeev Balappa Khanagar, Khaled Mubarak Alfaran, Yaser Basher Alenazi, Abdulrahman Majed Aloqayli, Abdulmalik Hesham Alsahhaf, Fahad Rashed Alotaibi, Abdullah Hassan Alammari, Salem Mubarak Alkahtani, Abdullah MohammedSaed Gusti.

Journal of Clinical and Diagnostic Research, 2020 Aug;14(8):ZC01-05.

Introduction: The shortage of dental workforces in rural areas is a major concern in Saudi Arabia, which affects the delivery of oral health care services. Although there is an improvement in the dentist to population ratio, there still a wide disparity in dentist to population ratio in rural and urban areas. Aim: To assess the perception of dental interns to work in rural areas in Riyadh, Saudi Arabia and to know their willingness to serve rural population and factors associated with their decision.

Materials and Methods: A cross-sectional study was conducted among 400 dental interns from 6 dental colleges located in Riyadh, Saudi Arabia over a period of October to December 2019. Data was collected using a self-administered structured close ended questionnaire. Chi-square test and multiple logistic regression analysis were applied to measure the association of age, gender and marital status on their responses. A p-value <0.05 was considered as statistically significant.

Results: Out of 400 participants, 58% were willing to work in rural areas. Close proximity to hometown, in need for a job, rural placement program, fees and loan forgiveness and having rural background were the most favouring factors for working in rural area, whereas unfavourable working condition, lack of transportation facilities, poor accommodation, less scope for professional development and lack of necessary infrastructure were the main factors for reluctance. The male participants, Saudi nationals, rural residents, and the one whose fathers are less educated, were more likely to work in rural areas.

Conclusion: Based on the findings of the study a comprehensive human resource strategy be designed by health or medical educators in order to encourage dental students to take up jobs in rural areas.

Keywords: Interns career preference, Rural areas, Rural placement, Rural Saudi Arabia, Rural service

Prevalence and Characterization of Musculoskeletal Disorders among Dental Students, Interns, and Residents in Riyadh, Saudi Arabia.

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Medical Science, 2020 Jul-Aug;24(104):2565-2572.

Objectives: This study aimed to investigate the prevalence of work-related musculoskeletal disorders, assess its impact, identify its risk factors, level of awareness of the participants, and to recommend preventive measures based on the study results.

Methods: A self-structured self-administered questionnaire consists of 48 questions was distributed to participants from dental colleges at three universities (King Saud University, King Saud bin Abdulaziz University for health sciences, and Riyadh Elm university). A total of (431) participants were invited to answer the questionnaire. Chi-Squared test was performed to evaluate the influence of demographic characteristics (gender and level of education), the prevalence of musculoskeletal pain, and psychological impact.

Results: There was a significant difference between genders regarding pain, in which (53%) of females reported having pain, while only (35%) of males did. Periodontal scaling was the most reported cause of pain (51.8%). The psychological effect of pain was significantly higher in females (25%), while it was (12%) in males. Chairside stretching has a significant impact on reducing the presence of pain.

Conclusion: The prevalence of work-related musculoskeletal disorders in the dental field is high. In this study, females have a higher percentage of pain. Pain has a negative effect on a person's psychology. The use of magnification loupes and chairside stretching was found to be a protective factor against musculoskeletal disorders.

Keywords: Musculoskeletal disorders, Work-related pain, and Dental students

Knowledge and Awareness of COVID-19 among Dental Students, Interns, Clinicians and Academics.

Ali Aboalela, Ahmad AlShafei, Mandlin Abdulaziz Almousa, Ghadah Khalid Alhrbai, Amerah Saeed Alqahtani, Nassir Mohammed Bin Shraim.

International Journal of Medical Research & Health Sciences, 2020;9(7): 25-31.

Introduction: COVID-19 is a highly infectious disease caused by an RNA virus belonging to a large family of coronaviruses. WHO declared COVID-19 as a public health emergency and classified it as a pandemic.

Aim: The study aims to evaluate and assess knowledge with regards to COVID-19 among dental students, interns, clinicians and academics in Riyadh, Saudi Arabia.

Methodology: A cross-sectional study was conducted among 366 dental students, interns, joint academic appointee, and full-time faculty. Data was collected using an electronic based questionnaire distributed through E-mails. Data was entered and analyzed using SPSS Version 23 with a significance value of $p<0.05$. Chi-square test was used to compare categorical variables.

Results: Almost all participants acquire adequate level of knowledge regarding the mode of transmission, incubation period and symptoms of COVID-19. Approximately half of the participants 205 (56%) thought that standard precautions in the dental clinics were insufficient in the management of suspected cases of

COVID-19. Nearly all participants thought that elective dental treatment should be deferred, and only emergency treatment can be provided. However, there was a poor response regarding the correct survival duration of COVID-19 on plastic or stainless-steel surfaces and the use of pre-operational hydrogen peroxide mouth rinse as a method of preventing transmission.

Conclusion: This study identified areas where participants lacked the knowledge in managing COVID-19 with the best methods available especially at an undergraduate level. In order to have a more efficient and appropriate response for future pandemics, dental curriculums and educational activities should pro-actively provide training opportunities.

Keywords: Knowledge of COVID-19, Dental practitioners, Cross sectional study, Dental precautions, Disease transmission, Infection control

Correlation of Feeding Practices and Dental Caries among Preschool Children of Jazan, KSA: A Cross-sectional Study.

Zarah AH Dahas, Huda AJ Khormi, Satish Vishwanathaiah, Prabhadevi Maganur, Alhassan AA Owis, ***Sanjeev B. Khanagar***, Wejdan AM Alowi

International Journal of Clinical Pediatric Dentistry, 2020 Aug;13(4):327-331.

Objective: Breastfeeding is integral for the healthy development of infants during the first year of life. The objective of this study was to investigate the feeding practices and their effect on dental health among Saudi children in rural Jazan, the southern region of Saudi Arabia.

Materials and methods: A cross-sectional study was conducted among 330 participants from two villages namely Baish and Abu-Areesh of Jazan Province, Kingdom of Saudi Arabia. Mothers whose children were above 2 years of age agreed for a face-to-face interview to discuss about feeding practices followed for their children. Later, these children underwent a complete dental examination.

Results: In this study, it was found that a majority of mothers, 203 (61.15%) of them breastfed their children for less than a year, 105 (31.8%) of them breastfed for 2 to 4 years, and the remaining 22 (6.6%) of them breastfed for more than 4 years. Two hundred and forty-nine (75.15%) moms reported that they added sugar to milk while feeding and 259 (78.4%) mothers reported using sugar with pacifiers. Increased incidence of caries was seen with a statistically significant difference in children who were fed during sleep ($p = 0.038$), when the infant's teeth were not brushed after feeding ($p = 0.004$), and when sugar was added while feeding ($p = 0.001$).

Conclusion: Prevalence of dental caries was high in children who were fed during sleep and also in those kids using pacifiers containing sugar. Oral hygiene practices were also inadequate and positively associated with dental caries. These findings are suggestive of developing general and oral health interventions for children and also educating mothers on appropriate feeding practices.

Keywords: Bottle feeding, Breastfeeding, Dental caries, Oral hygiene

Psychological Impact of the coronavirus diseases 2019 (COVID-19) pandemic on dental students: A nationwide study.

Zaki Hakami, ***Sanjeev B. Khanagar***, Satish Vishwanathaiah, Abrar Hakami, Ahmed M. Bokhari, Ahmad H. Jabail, Dhafer Alasmari, Abdullah M. Aldrees.

Journal of Dental Education, 2021 Apr;85(4):494-503.

Objectives: Public mental health concerns have been raised during the coronavirus disease 2019 (COVID-19) pandemic. The aim of this study was to assess the psychological impact of the pandemic on dental students in Saudi Arabia.

Methods: A cross-sectional analytical study was conducted among dental students from different universities in Saudi Arabia selected using 2-stage cluster sampling. The psychological impact was assessed using the validated Arabic version of the Depression, Anxiety and Stress Scale–21 Item questionnaire. The data were analyzed using SPSS software. The Mann–Whitney *U* and Kruskal–Wallis tests were used as appropriate. A chi-squared test was used to compare the proportions between the sociodemographic data and logistic regression analysis to identify variables associated with the student's responses.

Results: The internal consistency of the scale was excellent (0.954). A total of 697 dental students participated voluntarily in the study; their mean age was 21.76 ± 1.859 years, and 54.7% were female. The majority (96.1%) were single, and 69.4% lived in a household of > 5 persons. Significant differences in mental health outcomes were evident for gender, university, and survey time. Elevated levels of depression, anxiety, and stress were recorded among 60.64%, 37.02%, and 34.92%, respectively, of the students. Females, students who lived alone, and junior students were more likely to experience psychological problems during the COVID-19 pandemic.

Conclusions: The presence of elevated levels of depression, anxiety and stress among dental students highlights the need for psychological empowerment strategies involving institutional counseling services.

Keywords: anxiety, COVID-19, Saudi Arabia, dental student, depression, mental health, psychological impact, stress

The effect of secondhand smoking on dental caries among schoolchildren in Riyadh, Saudi Arabia: A cross-sectional study.

Abed Al-Hadi Hamasha, ***Ashwaq A. Alfadhel, Asma A. Alshareef, Manal M. ALjamal, Nouf B. Albesher, Nourah M. Alaqaili, Thoraya S. Kinani***.

Journal of International Society of Preventive and Community Dentistry, 2020:10(1);69-75.

Aim: The aim of this study was to explore the relationship between dental caries and exposure to secondhand smoking in mixed teeth among Saudi children.

Materials and Methods: A cross-sectional study was designed to target schoolchildren aged between 6 and 13 years in their mixed dentition stage. A cluster random sample of schools teaching first to sixth grades from different regions in Riyadh city was used. Data were obtained by self-reported questionnaires and clinical dental examinations. Questionnaires comprised sections related to sociodemographic, behavioral, health characteristics, and questions related to mother and father smoking status, type, and duration of smoking, and whether parents smoked inside homes or not. The clinical dental examination was based on the basic methods of the World Health Organization criteria for decayed, missing, and filled teeth (DMFT) (1997). Statistical analyses included descriptive statistics, *t* test, and one-way analysis of variance.

Results: Of the 302 participating schoolchildren, 56% were females, 72% were Saudi nationals, and 84% were of normal weight. Of the total 3246 teeth examined, DMFT was found in 1922 teeth (mean DMFT = 6.36). Only eight mothers (2.7%) were smokers, seven of them smoked inside their homes. Majority of fathers were smokers (110, 37%) and 82% smoked inside their houses. It had been found that 26% of schoolchildren were exposed to secondhand smoking. The mean DMF scores were higher among schoolchildren with smoking fathers and mothers, and the difference was statistically significant (*P* = 0.05).

Conclusion: The DMFT among Saudi schoolchildren was 6.36. Children, who are exposed to secondhand smoking by their family members, are more likely to have dental caries in their mixed dentitions.

Keywords: Children, dental caries, Saudi, secondhand, smoking

A prospective Saudi dental stem-cell bank from the perspective of the public and dental practitioners: A cross sectional survey.

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Journal of Family Medicine and Primary Care, 2020;9:864-70.

Objectives: The aim of this study (1) To evaluate the Saudi public's knowledge and attitude on dental stem cells (DSC) for therapeutic/banking purposes, (2) To evaluate the perception of Saudi dentists towards DSC and their attitude towards banking of DSC.

Methodology: This was a cross-sectional study based on an electronic survey distributed through the social media nationwide among the Saudi public, and through paper-based surveys among dentists in Riyadh. By convenience, eligible study participants were Saudi adults from the community and dentists from 17 dental centers in different regions of Riyadh. Using SPSS v. 25, descriptive statistics (n,%; PMS ± SD) and bivariate analyses (Pearson's Chi square, Mann Whitney) were conducted to determine factors associated with the study outcomes, with a *P* value statistically significant at <0.05.

Results: For the Saudi public, 1494 participants completed the survey. The PMS ± SD of public knowledge was 25.5 ± 25.9, while their attitude was 80.2 ± 27.0. Factors associated with higher knowledge scores were younger age groups, while female participants, older age groups, university educated and employed participants had higher attitude. For Saudi dentists, 246/262 (94%) dentists responded to the questionnaire. Their PMS ± SD of perception towards DSC research for regenerative purposes was 74.5 ± 15.6. Factors associated with higher perception scores were those with more experience. Dentists who had higher perception scores towards DSCs were significantly more willing to save teeth for regenerative dental treatment.

Conclusion: The Saudi public community had poor knowledge about the therapeutic and research benefits of DSC, yet high degree of attitude to enroll in a future Saudi DSC bank. Saudi dentists had moderately high levels of perception towards DSC research.

Keywords: Dental Pulp Stem cells, dental stem cell, stem cells banking, stem cells from human exfoliated teeth

Trending career preferences of future dentists of Saudi Arabia and factors influencing their choices.

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Medical Science, 2020 Sep;24(105):3168-76.

Aim: This study is intended to highlight the current career choices and the speciality preferences and the motivating factors of all 27 dental collages in the Kingdom of Saudi Arabia.

Methodology: A questioner survey was collected as hard and soft copy among 364 participants who are Saudi dental students and Saudi dental interns.

Results: a response rate of 86.9% (230) paper-based surveys and 289 electronic survey filled, of which 64.4% (315) are male and 35.6% females (174). The most preferred speciality among males is Endodontics, Prosthodontics, and Orthodontics respectively. Whereas, females Restorative, Prosthodontics, and Orthodontics. As for the motivational factors, employment benefits and guaranteed salaries were among the highest for males, and length of residency for females. Discussion: previous studies have shown a different trend in speciality and career choices. However, the topic of speciality is continuously changing. Moreover, the motivating factors are comparable with other studies.

Conclusion: non-clinical specialities were among the least preferred specialities. However, those specialities have a critical role in the dental field. Employment benefits and short residencies may aid in more people choosing these specialities.

Keywords: Career preferences, Trending career, Future dentist, Saudi Arabia.

Personality Traits and Academic Performance of Dental Students and Interns in Riyadh, Saudi Arabia.

Hicham Riba, Lolowh Almogbel, Azzam Al-Jundi, Saleh Sakka

International Journal of Medical Dentistry, 2020 Sep; 24(3):338-342.

Aim: to investigate the possible correlation between personality traits and higher grade point average GPA among dental students at a Saudi dental college.

Materials and methods: Dental students and interns at College of Dentistry, King Saud Bin Abdulaziz University for Health Sciences were asked to participate in the study. Method of assessment: an online 50-question Five Factor Model Test conducted by a specialized company in the field of human resources (www.truity.com), performed using I-Pad devices. The GPA was collected by each student and plotted against each of the five personality traits (openness, conscientiousness, extraversion, agreeableness and neuroticism).

Results and discussion: The final study sample consisted of 159 participants representing all levels in the college of dentistry. The study showed that the most dominant personality trait is agreeableness, while high conscientiousness was the least dominant personality trait found among both males (17.8%) and females (21.1%). When looking into the GPA, most of the females were above 4.5 and only 1.7% of them were below 4. However, among males only 11.1% had a GPA above 4.5, while 46.7% had a GPA below 4. Openness was found as significantly correlated with agreeableness and conscientiousness, whereas agreeableness was found as significantly associated with neuroticism. However, they are inversely related. There was a significant inverse correlation between GPA and agreeable female students. Also, a significant relation between extravert male students and conscientiousness was observed.

Conclusions: The more open a person is, the more agreeable and conscientious he/ she is. Female students registered higher GPA than male students.

Keywords: dental students, GPA, personality traits

Effectiveness and Safety Measures to be Considered when using Alcohol-Based Hand Rub Products in Combating Coronavirus Disease (COVID-19).

Sanjeev Balappa Khanagar, Ali Al-Ehaideb, Prabhadevi C. Maganur, Saurabh Jain, Aparna Aggarwal, Satish Vishwanathaiah.

Journal of Critical Review, 2020 Oct; 7(12):4415-4418.

Abstract: The coronavirus diseases (COVID-19), an ongoing pandemic, have affected individuals on a global scale causing debilitating effects. Just like any other airborne infection, the primary way through which it spreads is by person-to-person contact, which is when we come in direct contact with the infected individual. What started as a cluster of viral pneumonia cases in Wuhan, China, has conquered the world impacting most countries badly. We do not perceive any improvement and the circumstance just is by all accounts compounding given the expanding loss of life rates and the quantity of new cases detailed each day. This is mainly because there are no antiviral therapeutics available that have the potential to destroy the virus. Antiviral medications are under investigation and coming up with a vaccination against this deadly virus could take time. Until then, the World Health Organization (WHO) has instructed individuals to follow basic preventive measures such as washing of hands frequently (using alcohol-based hand rubs or simply even using soap and water), use of protective mouth masks, maintaining social distancing of 1 meter (3 feet) between every two people and practicing good respiratory hygiene to escape from the clutches of COVID-19. The principle point of this paper is to report the effectiveness of alcohol-based hand rubs in combating/battling viruses and safety measures that must be considered while utilizing these alcohol-based hand rubs.

Medical and Dental Students' Knowledge and Perceptions about Antimicrobial Stewardship: A Call for Educational Enhancement

Nada Alsaleh, Abeer Alsmari, Fadiyah Alanazi, Abdulmohsen Alsaleh, ***Rahaf Alsmari***, Nasser Al-Swedan

Military Medical Science Letters, 2020 Oct;89:1-8.

Purpose: To explore the knowledge of antibiotics use and resistance among medical and dental students. **Methods:** A 26-item online questionnaire on antimicrobial prescribing was distributed to Medical and Dental students at eight universities from the period of July to August 2020.

Results: Five hundred three students completed the questionnaire; The mean age was 22.15 ± 1.99 and 66.4% were female students. The majority (91.5%) of the students were from governmental universities and (73.4%) were from medical colleges. It was found that 87% of students were not familiar with and unaware of the term antimicrobial stewardship. Overall knowledge about antibiotics identified that 30 (6%) students had good knowledge while 402 (80%) students have fair knowledge. Around 91% of the students agreed that the inappropriate use of antibiotics causes antibiotic resistance and that a strong understanding and knowledge of antibiotics is essential in their careers.

Conclusions: To control the growing problem of antibiotic resistance, future prescribers' education related to the appropriate use of antibiotics is important. Efforts must be undertaken to educate medical and dental students about the practices of the appropriate use of antibiotics and principles of antimicrobial stewardship.

Keywords: Antimicrobial Stewardship; Medical and Dental Students; Antibiotic Use and Resistance; Saudi Arabia

Psychological Impact of the COVID-19 Pandemic on Dental Interns in Riyadh, Saudi Arabia: A Cross-sectional Survey.

Sanjeev B Khanagar, Abdulmohsen Alfadley

International Journal of Clinical Pediatric Dentistry, 2020 Sep-Oct; 13(5): 508-512.

Background: Dental profession is labeled as a high-risk profession, due to which dental care professionals are under tremendous pressure during the outbreak of COVID-19 pandemic. The aim of this study was to assess the psychological impact of the COVID-19 pandemic on dental interns in Riyadh, Saudi Arabia.

Materials and methods: A cross-sectional study was conducted among dental interns from different universities in Riyadh, Saudi Arabia. The data were collected using a validated Depression, Anxiety and Stress Scale-21 Items (DASS-21) questionnaire. Descriptive statistics were presented using frequencies (*n*) and percentages (%). Chi-square and Fisher exact tests were used to assess the association between sociodemographic data (age, gender, nationality, marital status, and history of physical and mental illness) and levels of depression, anxiety, and stress. A $p < 0.05$ was considered as statistically significant.

Results: A total of 160 dental interns were invited to participate in this survey; out of which 110 participants responded yielding a response rate of 78%. The mean age of the study participants was 25.1 years. About 65% of the participants were female. Only 14.5% of the subjects reported having a past history of physical or mental illness. Depression, anxiety, and stress were identified in 11.9%, 7.3%, and 0.9% of the dental interns, respectively. Demographic characteristics did not appear to influence depression, anxiety, or stress levels ($p > 0.05$).

Conclusion: The outbreak of COVID-19 pandemic has affected the mental health of dental interns. The presence of depression, anxiety, and stress among dental interns highlights the need for special intervention and support programs to promote mental health and well-being among dental interns.

Keywords: Anxiety, COVID-19, Dental Interns, Depression, Mental Health, Psychological impact, Stress.

Age-related Oral Changes and Its Impact on Oral Health-related Quality of Life among Frail Elderly Population: A Review

Sanjeev B. Khanagar, Ali Al-Ehaideb, Madhuniranjanswamy Mahalakshmamma Shivanna, ***Ikram Ul Haq***, Abdulaziz Abdullah Al Kheraif, Sachin Naik, Prabhadevi Maganur, Satish Vishwanathaiah

Journal of Contemporary Dental Practice, 2020 Nov;21(11):1298-1303.

Background: In the present-day world, the aging elderly across the world are living longer. Most people are expected to live well into their sixties and even beyond. The increasing life expectancy of the aging population could be due to increased availability of healthcare facilities and improved quality care provided by them. Alongside increasing life expectancy, the individual's quality of life and also his/her oral healthrelated quality of life (OHR-QoL) are expected to improve so that they can enjoy their aging life.

Aim: The aim of this review article is to highlight aging-related oral health changes and their impact on the individual's quality of life.

Review results: Age-related oral changes are seen in the tooth structure making the enamel more brittle resulting in severe attrition. Autoimmune diseases like Sjogren's syndrome are followed by decrease in the salivary gland function and the reason is unknown, and medications like antihypertensive and

analgesics are associated with the decrease in salivary flow, which increases the patient's risk of developing dental caries, and also make the oral tissues more prone to mucosal infections. Edentulism has also been directly related to masticatory problems and nutritional problems. The studies reported on OHR-QoL of these frail elderly populations have shown lower scores.

Conclusion: It is important for health professionals, especially those dealing with these frail elderly populations, to have a better understanding of their dental needs and also understand the physiologic changes undergone by them. The health professionals should understand and comprehend the oral health challenges these vulnerable people face. Clinical significance: Healthcare providers should conduct periodic oral examinations along with general examination and should avoid prescribing medications that have xerostomia as a side effect. The elderly individuals should be encouraged to keep their mouth moist using water or artificial saliva and maintain good oral and denture hygiene.

Keywords: Age-related oral changes, Geriatric oral health, Oral health, Quality of life

Knowledge, attitude and practice of oral hygiene among nursing staff in pediatric care hospitals in Riyadh, Saudi Arabia.

Sanjeev B. Khanagar, Nouf Alhamlan, Hadeel Alotiabi, Sundus Altuwayjiri, Mandlin Almousa, Wafa Alhejaili, Rawan Alanazi, Naheel Alkhudiri.

Indo American Journal of Pharmaceutical Sciences, 2020 Dec; 7(12):776-787.

Abstract: Pediatric nurses have the greatest contact with mothers and children among health care providers, so the aim of this study was to assess the knowledge, attitude, and practice of oral hygiene among the nursing staff in Riyadh hospitals, Saudi Arabia. A cross-sectional study was conducted among 350 randomly selected pediatric nurses. The data was collected using a self-administered structured questionnaire under four main sections: demographic details, knowledge, attitude, and practice. Chi-square test was used, and data was entered and analyzed using SPSS Version 23 with a statistically significant value of $P < 0.05$. Results have showed that 58.7% of the participants did not have oral health care courses in their nursing curriculum, and only 21.4% had attended oral health training programs. The majority of the participants were aware of the importance of good oral health for the child's overall health. 60% knew the correct timing of teeth eruption, 20% were aware of the risk of transmitting dental caries. Almost all nurses consider oral health care as a part of nursing care and oral diseases are preventable. However, 21% consider cleaning the patient's mouth an unpleasant task, and 33.3% consider oral health care delivered by nurses is insufficient. The majority examine the oral cavity and perform oral hygiene practices. Only 22.2% reported that they had an oral health training program. 80% emphasize on regular dental checkups, demonstrate oral hygiene techniques, document oral findings, and refer patients to the dentists. Pediatric nurses' have a concerning level of knowledge regarding oral health care and should be encouraged to promote oral health to their patients. Keywords: Pediatric Nurses; Oral Health Behavior; Nursing staff; Oral Hygiene.

COVID-19 Pandemic: Oral Health Challenges and Recommendations.

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European Journal of Dentistry, 2020 Dec;14(Suppl-1):S165-S-170.

Abstract: The aim of this article is to shed light on coronavirus disease 2019 (COVID-19) and its oral effects and risk of nosocomial transmission to update the knowledge of dental health care workers. A thorough literature search of the PubMed/Embase/ Web of Science/Cochrane central database was conducted to identify the impact of COVID-19 on oral health. We reviewed the recommendations on the

recent guidelines set by the Centers for Disease Control and Prevention infection control practices for dentistry, American Dental Association, and the World Health Organization. According to the available evidence, COVID-19 may have a negative impact on the oral health due to the infection itself and due to various other consequences such as therapeutic measures, xerostomia, and other complications of the COVID-19. In light of the above facts, dentists should be wary of the disease, its identification, mode of spread and impacts on the oral health. The dental personnel have been identified as at the highest risk of getting COVID-19 due to cross infection from contact with their patients and aerosols generated in routine dental procedures. As such, they should be aware of the modifications that need to be made to the practice to prevent transmission of the disease. It is evident that COVID-19 has a negative impact on the oral health and at the same time a significant transmission risk to the dental personnel and patients who visit the clinic. If the recommendations issued by the regulatory authorities are meticulously followed, the risk of disease transmission can be lessened.

Keywords: coronavirus, SARS-CoV-2, COVID-19, oral health, recommendations, guidelines, dental practice

Perceptions of smoking cessation counseling among dental students in Riyadh, Saudi Arabia: A cross-sectional study.

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Imam Journal of Applied Sciences, 2019;4(1):21-29.

Context: The dental clinic is presumed to be a suitable and practical place for smoking cessation counseling. Clinical dental students have an opportunity to play a crucial role in educating their patients about the impact of smoking and promote their oral and general health.

Aims: This study aims to determine the perceptions of clinical dental students toward smoking cessation counseling and the barriers to promote it.

Settings and Design: This cross-sectional study was conducted in Riyadh, Saudi Arabia in July 2017 among clinical dental students and interns of five dental schools.

Subjects and Methods: We used a questionnaire derived from a similar study. The online questionnaires were distributed through social media.

Statistical Analysis Used: Data analysis was achieved using SPSS 24.0 Mac version (Release 24.0, IBM, USA) through Chi-square test. Statistical significance was considered at $P < 0.05$.

Results: A total of 291 individuals participated in the study. Most of the respondents were nonsmokers (79.4%). In comparison between junior and senior dental students with regard to their perceptions of smoking cessation counseling, it was found that there was no significant difference between the two groups. Most of the respondents were interested in becoming trained on how to assist patients to quit (72.9%). Furthermore, the majority of participants inquired about their patients' smoking status (87.6%). The most frequently cited barrier was lack of training to help patients quit smoking (67%).

Conclusions: This study identified the lack of appropriate training and insufficient knowledge toward tobacco use cessation counseling.

Keywords: Cessation, dental student, Saudi Arabia, smoking

Attitudes and Barriers Toward Conducting Research Among Dentists in National Guard Health Affairs, Riyadh.

Aisha Basudan, Masud Nazish, Qureshey Aisha, Alrukban Lamia, Alnashwan Malk, Alburaidi Yara.

International Journal of Dentistry and Oral Health, 2019 Jan; 5(1):1-8.

Objectives: The aim of this study is to assess the attitude of National Guard Health Affairs' (NGHA) dentists toward conducting and contributing in the research process, and to identify the barriers and obstacles they might face.

Methods: A cross-sectional survey was conducted using a self-administered questionnaire to collect data from 128 practicing dentists in NGHA, Riyadh. The questionnaire was designed based on reviewed relevant published studies, and then face validation of questionnaire was done. Non-probability convenient sampling technique was used so that all the dentists available during the study time period were included. The questionnaire consisted of three parts: demographic details of the participants and past research experience, attitudes towards research, and barriers upon conducting research.

Results: The vast majority of our participants had positive attitudes towards research; 87.5% seemed to be willing to be involved in research, and 83.6% altered an element of their practice. Specialists and consultants were more significantly willing to apply research outcomes in their practice than general practitioners. Positive attitudes were also found toward the impact of research; 96.9% of our participants thought that by conducting research their knowledge increases, and 93.8% believed that career prospects would be better. In the current study, the main barrier to research was reported as time constraints due to workload and busy schedules (87.5%), followed by and lack of support from funding agencies to conduct research (84.4%), and lack of documentation and maintenance of records (76.6%). In addition, 81.2% of the participants did not report good interdepartmental coordination needed to conduct research.

Conclusions: A large majority of surveyed dentists considered research useful for their profession and showed positive attitudes toward conducting research. However, they considered it difficult to conduct research, with the main barriers being lack of: time, financial support, good interdepartmental coordination, and proper documentation of patients' records.

Keywords: Dental Research, Attitude of Health Personnel, Research Barriers, Financial Support, Lack of Time, Interdepartmental Coordination

Recall practice among dental practitioners in Riyadh, Kingdom of Saudi Arabia.

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The Journal of Contemporary Dental Practice, 2019 Jan; 20(1):26-31.

Aim: The study aims to assess recall practice among dental practitioners in Riyadh, Saudi Arabia.

Materials and methods: A 24-item questionnaire was used to collect information about the general practice, knowledge of dental recall, and factors affecting dental recall from general dental practitioners in Riyadh. The questionnaire elicited data on personal information (8 items), practice information (3 items), knowledge about the dental recall (3 items), recall practice (6 items), and patient factors that might influence recall (4 items). A five-point Likert scale showed the level of agreement in cases that required recall visits, reasons for patients not returning for recall, and techniques to encourage return for recall.

Results: A total of 315 questionnaires were analyzed (response rate = 46.3%). The mean age of participants was 32.4 years old and 52.4% of participants were male. Eighty-four percent of respondents reported that they routinely perform regular recall with their patients. Recall practice was significantly

associated with practitioner experience, country of graduation, and workplace. Practitioners who graduated from Saudi universities were found to be less likely to practice regular recall visits compared to others ($p < 0.01$). On the other hand, practitioners who are working in university hospitals are more likely to practice dental recall compared to those who are working only in dental clinics ($p = 0.02$).

Conclusion: A low percentage of dentists advocated and practiced regular recall visits in their private practice. Efforts should be undertaken to educate the practitioners on the importance of regular recall visits in their healthcare settings.

Clinical significance: Scheduling appropriate recall visits is an essential component for achieving successful treatment outcomes. This study highlights the poor recall practice among dentists and the need to raise the awareness of the importance of recall visits.

Keywords: Dental; Recall Questionnaire.

Assessment of Parents Knowledge about Oral Health in National Guard Primary Schools, Riyadh, Saudi Arabia.

Mohammed Nasser Aldosari, Ibrahim Aljabali, Abdullah Altammami, Abdulrahman Obaid, Abdulaziz Fakih, Emad Alshehri, Nasser Al Shraim

International Journal of Medical Research & Health Sciences, 2019 Feb; 8(2): 64-68.

Aim: Evaluation of parents' knowledge about oral health in primary schools of the National Guard, Riyadh.

Methods: A cross-sectional study was carried out in King Abdullaziz Iskan City. Parents of 257 school children, who completed a self-administrated questionnaire, were involved in this study.

Results: It was revealed that there was a lack of knowledge and awareness of the importance of fluoride, regular dental visit, and plaque. In contrast, good knowledge about brushing and the relation between oral health and general health was observed. Also, a mother with a high level of education has knowledge better than mothers who have a low level. In addition, the families with higher income have more knowledge especially about fluoride and dental visits.

Conclusion: Parents' knowledge about the importance of oral health needs to be improved because children mostly gain knowledge about oral health and hygiene from their parents and then start establishing their habits. Coordinated efforts by dentists and other health professionals are required to impart dental health education about oral health and preventive care among parents.

Keywords: Evaluation, Care givers, Education, Oral status

The relationship between body mass index and oral health status among Saudi adults: a cross-sectional study.

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Community Dental Health, 2019 Feb; 36(1):217-222.

Objective: To assess the relationship between body mass index (BMI) and the sum of decayed, missing and filled teeth (DMFT), periodontal pockets, and oral soft tissue variations.

Basic research design: A systematic sample of 250 people attending King Abdulaziz Medical City was included. The study was conducted using questionnaires and clinical examinations. Questionnaires were

prepared to include socio-demographic, smoking, oral hygiene, medical and physical variables. Clinical examination included DMFT, pocket depths and soft tissues changes. BMI was calculated as kg/m² using height and weight. Analyses included descriptive statistics, ANOVA, Chi-square and logistic regression.

Results: Participants mean age was 35.3 years (18-83 years), and about 60% were females. The mean BMI was 28.24. Two thirds (67%) of participants were overweight (BMI=25.0-29.9kg/m²) or obese (BMI)30kg/m²). Mean DMFT correlated with BMI (p=0.005). However, periodontal pocket depths were not associated with increased BMI. In the bivariate analyses, there were associations between BMI and age, education, smoking, tooth brushing, hypertension, diabetes, use of medication and traumatic ulcer. Logistic regression analysis revealed a significant relationship between BMI and DMFT in people educated to less than high school, current smokers, those with any medical problem or with edematous gingiva (P=0.026).

Conclusion: Participants higher BMI were more likely to have a higher DMFT score in the presence of low education, presence of edematous gingiva, smoking or a medical condition.

Keywords: BMI; DMFT; Health; Lesion; Oral.

Predictors and Level of Job Satisfaction among the Dental Workforce in National Guard Health Affairs.

Abed Al-Hadi Hamasha, Abdulmajed Alturki, Nasser Alghofaili, Ahmed Alhomaied, Faisal Alsanee, Faris Aljaghwani, Mohammed Alhamdan, Ashraf El-Metwally

Journal of International Society of Preventive & Community Dentistry, 2019 Jan-Feb;9(1): 89-93.

Objective: To assess the level of job satisfaction among the dental workforce in the National Guard Health Affairs (NGHA) in Saudi Arabia and to explore any predictors that have impact on the level of satisfaction.

Materials and methods: A cross-sectional study targeted dentists, dental assistants, dental hygienists, and dental lab technicians who are workers for the NGHA. A cluster random sampling procedure was conducted from seven dental centers. Data were collected through a self-reported questionnaire that was previously published. Satisfaction questions were related to (a) professional and personal life, (b) income and job security, (c) quality of service, and (d) prestige and self-perception domains. Data analysis included frequency distributions, and a comparison of mean using *t*-test was conducted using SPSS software.

Results: The response rate was 55.5%. The mean satisfaction score was 65.7 out of 112 (2.9 out of 5). Of the four domains pertaining to job satisfactions, the highest mean score was obtained for quality of service (4.2 out of 5), followed by prestige and self-perception (2.8 out of 5), professional and personal life (2.8 out of 5), and income and job security (2.6 out of 5). Non-Saudis were found to be significantly more satisfied in professional and personal life; however, Saudi dentists were more satisfied for income and job security and quality of services.

Conclusions: In general, the dental workforce practicing in NGHA experience a low level of job satisfaction. Professional and personal life, income and job security, and quality of services are all important factors affecting the level of job satisfaction.

Keywords: Dental workforce; Saudi Arabia; job satisfaction.

The Association between Birth Order and Academic Performance of Undergraduate Dental College Students in Riyadh, Saudi Arabia.

Abdullah Albarkheel, Emad Masudi, ***Hicham Riba, Azzam Al-Jundi,*** Saleh Sakka

Journal of Clinical and Diagnostic Research, 2019 Jun; 13(6):JC01-JC05.

Introduction: Children in the same family are different from each other in their academic achievement and birth order plays an important role in defining a child's character and personality. Grade Point Average (GPA) refers to the grading processes used to measure educational achievement.

Aim: To investigate the association between birth order (sibling rank) and academic performance in connection with other variables such as sibling size, gender, age, parent's education, parent's job and family monthly income.

Materials and Methods: The study design was a cross-divtional survey where data were collected by a self-administered questionnaire to gather information about students' Cumulative Grade Point Average CGPA, birth order, age, socioeconomic status of the parents, family size and gender. Various methods were used for assessment such as written and oral exams, Objective Structured Clinical Examination (OSCE), Objective Structured Practical Examination (OSPE) and oral case presentation. A total of 308 questionnaires were distributed to the participants (174 male and 134 female) out of which 269 (148 male and 121 female) were returned. Excel sheet was used before reverting to statistical software SPSS version 20.0 for analysis. The F-test (ANOVA) compared the mean CGPA by the birth order. General linear model was used as a multivariable analysis to accommodate for other baseline characteristics. Chi-square test assessed the relationship between the birth order and CGPA categories. p-value <0.05 considered significant.

Results: Comparing the mean CGPA between genders, females had higher mean than males with significant difference (p<0.001). While there was no significant difference in mean CGPA across the birth order groups (p=0.06). The results showed that the mean of the middle-born male participants had a CGPA of 4.31±0.32 compared to the last born with a CGPA of 4.17±0.43 and first or only child with a CGPA of 4.06±0.38, whereas the participants who were not the first born but the first gender or only gender had a CGPA of 4.01±0.45.

Conclusion: This study found that middle-born males in Riyadh dental college had shown the highest tendency to have better academic performance compared to other birth order groups. Females did not show the same tendency and are eager to achieve high level in academic education regardless of their birth order or family size. The controversy of birth order effect on academic performance may continue to vary among countries, family sizes and different cultures.

Keywords: Cumulative grade point average, Education performance, Siblings

Parents Knowledge and Awareness of their Children's Oral Health in Riyadh, Saudi Arabia.

Abed A-H. Hamasha, Salman J. Rasheed, Mohammed M. Aldosari, Zainul Rajion

The Open Dentistry Journal, 2019 Jul;13:236-241.

Objective: To assess the parents' knowledge and awareness of their children's oral health in Riyadh, Saudi Arabia.

Methods: The study was a cross-sectional analytical study of Saudi parents. A self-administered questionnaire was collected from 324 parents in public parks and malls. In addition to the demographic questions, parents' knowledge about the number of primary teeth, tooth brushing, best time of dental visits, the meaning of plaque and calculus, the importance of fluoride, the relationship between primary and permanent teeth and the effect of oral health on general health were questioned. Data analysis included

descriptive statistics and one-way analysis of variance and Bonferroni tests to assess differences in the mean number of correct answers among demographic categories. A *p*-value of 0.05 was set at a significant level.

Results: The percentages of correct answers ranged from 26% to 75% depending on the type of questions. Only 26-28% could identify the number of primary teeth and the duration of teeth brushing. About one-third of parents knew the time of the first dental visit and the definition of plaque and calculus. Between 63-75% of parents believed that primary teeth can affect permanent teeth and mouth problems can affect general health. On average, 59.2% of participants provide incorrect answers about their children's oral health. The numbers of correct answers were significantly increased by increasing education and income.

Conclusion: Parents' knowledge and awareness of oral health among Saudi parents were poor. Special attention should be given to parents with low socioeconomic status who need to be educated about children oral health more.

Keywords: Parent, Knowledge, Awareness, Oral health, Saudi, Demographic questions.

Barrier to access and dental care utilization behavior with related independent variables in the elderly population of Saudi Arabia.

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Journal of International Society of Preventive and Community Dentistry, 2019 Jul 1;9(4):349-355.

Objectives: The study aimed to evaluate barriers associated with access and utilization of dental services among the elderly population of Saudi Arabia.

Materials and methods: A systematic random sample of 350 elderly people recruited from various gathering places of the elderly including all nursing home residents (*n* = 73) was included in this study. The data were collected through face-to-face structured interviews related to access and utilization of dental services, and sociodemographic, behavioral, medical, and financial barriers to dental services. Statistical analysis included frequency distributions, chi-squared tests, and regression analysis using the Statistical Package for the Social Sciences (SPSS) program.

Results: Approximately 37% of the elderly had proper access to and utilization of dental services. Independent variables that affect access and utilization of dental services were low income (odds ratio [OR] = 2.23, confidence interval [CI] = 1.34-3.72), unmarried participants (OR = 3.25, CI = 1.75-6.05), community residents (OR = 5.15, CI = 2.52-10.53), smokers (OR = 1.93, CI = 1.02-3.68), irregular users of toothbrushing (OR = 3.53, CI = 2.09-5.95), no dental insurance (OR = 1.88, CI = 1.06-3.37), and unaffordable price (OR = 2.55, CI = 1.38-4.69) in the bivariate analysis. In logistic regression analysis, the significant variables that were associated with proper access and utilization of dental services were having dental insurance (OR = 2.24, CI = 1.15-3.82), affordable prices (OR = 2.19, CI = 1.21-3.70), brushing regularly (OR = 3.58, CI = 2.01-6.37), higher education (OR = 1.87, CI = 1.10-3.20), and being married (OR = 1.68. CI = 0.97-2.91).

Conclusion: Lack of perceived need, no dental insurance, unaffordable price, transportation, and fear from dental treatment were the most common significant barriers to dental services.

Keywords: Access; Riyadh; Saudi Arabia; dental services; the elderly; utilization.

Influence of Lifestyle on Dental Health Behavior.

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Journal of Lifestyle Medicine, 2019 Jul;9(2):119-124.

Background: Lifestyle is a general way of living, which is based on the interplay between living conditions, and individual patterns of behavior as determined by socio-cultural factors, and personal characteristics. There is a paucity of studies assessing the role of various factors, including lifestyle, on the dental health behavior. The present study aims to determine the factors that influence the dental health behavior among a subgroup of adult patients attending a tertiary care center in Riyadh, Saudi Arabia.

Methods: This cross-sectional questionnaire survey was conducted at King Abdulaziz Medical City, Riyadh, Saudi Arabia. The questionnaires were distributed to a convenient sample of 300 individuals, which gathered information on the socio-demographic data, lifestyle and dental health behaviors. Bivariate analyses were used to explore the associations between each of the covariates and p-value < 0.05 was considered to be statistically significant. Multivariate logistic regression model was built using backward stepwise method for the dependent variable 'dental behavior'.

Results: Of the 300 questionnaires that were distributed, 279 were returned completed (response rate = 93%). The majority of our samples were Saudis (73.1%) and females (54.1%), with more than half the respondents having completed baccalaureate degree (55.2%) and about a quarter with either Masters or PhD. The mean age ± SD of the respondents was 35 ± 9.1 and the median age of '32 years' was used to categorize the age (≤32 and > 32). Multivariate logistic regression analysis showed that gender (OR^a = 2.84; 95% CI: 1.63–4.95), age (OR^a = 0.51; 95% CI: 0.3–0.87) and lifestyle (OR^a = 1.4; 95% CI: 1.18–1.68) were independently associated with dental behavior after adjusting for all the other variables. Age, gender and nationality were also found to be significantly associated with lifestyle (p < 0.01).

Conclusion: Older adults, women and individuals with a healthy lifestyle were found to be significantly associated with positive dental behaviors.

Keywords: Cross sectional survey, Life style, Oral health behavior

Knowledge, Attitudes and Perception toward Radiation Hazards and Protection among Dental Professionals in Riyadh, Kingdom of Saudi Arabia.

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International Journal of Medical Research & Health Sciences, 2019 Sep;8(9):75-81.

Introduction: Radiation hazards are harmful, and it becomes precarious when there is a professional negligence or ignorance.

Objectives: To evaluate the knowledge, attitude and perception among dental students and dental practitioners toward dental radiation and to assess the difference in knowledge between dentists, dental staff and dental students.

Materials and methods: The study was comprised of 550 participants. The information was collected from each participant through structured questionnaire consisting of 39 close-ended questions. Statistical analysis: Chisquare to test the association of knowledge, attitudes and perception (KAP) with gender, occupational sector and educational qualification and one-way analysis of variance to compare the difference in means of KAP between the three different groups of professionals and gender.

Results: Out of the 550 dental professionals who participated in the study, 293 (53%) were dental students, 83 (15%) were dental staff and 174 (32%) were dentists. Dental students showed higher KAP values towards radiation hazards protection followed by dentists and dental staff.

Conclusion: From the results obtained in this study, it was noted that the KAP level with regard to radiation protection was higher among dental students compared to dentists, and the least KAP value was found with dental staff.

Keywords: Dental professionals, Radiation hazards, Radiation protection

Oral Health Status and Oral Health-Related Quality of Life (OHRQoL) in Patients with Removable or Fixed Partial Dentures in King Saud Bin Abdulaziz University for Health Sciences (KSAU-HS) Dental Clinics.

Waleed Almutairi, Amritha, Fahad Alawad, Mohammed Aldosari, Abdulrahman Alshalan, Khalid Alajlan

International Journal of Medical Research & Health Sciences, 2019 Nov;8(11): 90-100.

Introduction: Many factors of tooth loss will compromise chewing and general health and quality of life. Saudi populations demonstrate a high prevalence of caries and a striking increase in dmft/DMFT. Usually, tooth loss is rehabilitated by different prosthetic options including implant, fixed partial denture and removable partial denture.

Aim: To evaluate the relation of oral health-related quality of life with the type of prosthesis and oral health status among patients who have removable or fixed partial dentures in King Saud bin Abdulaziz University for health science, college of dentistry.

Material and methods: Cross-sectional study would be conducted at the College of Dentistry, King Saud bin Abdulaziz University (KSAUHS) and Dental Centre, KAMC, NGHA. Convenient sampling was carried out by selecting 109 patients from those who visited the dental clinic. Oral health status was captured using the DMFT index. The collected data were entered and analyzed by adapting the SPSS computer software.

Result: The type and quality of prosthesis and its effect on the OHRQoL on patients showed no significant relation (p=0.459), but the duration of wearing of prosthesis showed significant relation (p=0.046). Regarding DMF total of (n=109), 61 had low DMF, 48 had high DMF witch was statically significant (p=0.02).

Conclusion: At the end of this study we conclude that there were no significant impacts on quality of life in relation to the type of prosthesis. On the other hand, we found a significant relation with OHRQoL in function domain, esthetic part and oral health status.

Keywords: Oral health, Quality of life, Fixed prosthesis, Removable prosthesis, Patient satisfaction, Oral health impact profile

Impact of electronic cigarette smoking on the Saudi population through the analysis of literature: A systematic review

Sanjeev Balappa Khanagar, Salman Siddeeqh, Vineet Khinda, Paramjit Khinda, Darshan Devang Divakar, Chitra Jhugroo.

Journal of Oral Maxillofacial Pathology, 2019 Dec;23:473.

Abstract: Tobacco usage is harming the health, the treasury and the spirit of Saudi Arabia. Every year, more than 7000 of its people are killed by tobacco-caused diseases. Still, more than 20,000 children and 3,352,000 adults continue to use tobacco each day. Likewise, the usage of electronic (e)-cigarette is also

increasing; this could be because of the publicity and marketing strategies adopted by the manufacturers of these products which are attracting the younger population. This review was taken up to determine the usage and attitude toward e-cigarette smoking among the Saudi population through the analysis of literature. This review identified peer-reviewed articles using several search terms and databases from 2010 to 2018. PubMed, ISI-Web of Science, Medline and Google Scholar were searched using the following alternate terms for e-cigarettes: electronic cigarettes, electronic nicotine delivery systems following which hand search was conducted through the reference list of articles. The search results only found descriptive data on these e-cigarettes among the Saudi population. This literature review reported that the usage of these e-cigarettes was high among this population and recorded a wide variety of reasons for using e-cigarettes. Reducing tobacco use, considering e-cigarette as less harmful, less addictive, for pleasure and peer influence, lower cost and curiosity were the most commonly reported reasons. Recognizing the dangerous impact of smoking and usage of other type of tobacco, the aggressive marketing of these e-cigarettes needs to be controlled.

Keywords: Addiction, electronic cigarette, nicotine

Risk indicators of depressionamong medical, dental, nursing, pharmacology, and other medical science students in Saudi Arabia.

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International Review of Psychiatry, 2019 Dec;31(7-8);646-652.

Abstract: The aim of the study was to investigate the prevalence and risk indicators of depression in undergraduate students of health-related specialties. A systematic random sample of 398 students from seven health colleges was included. The assessment tool was a self-reported questionnaire based on Becks Depression Inventory (BDI). Participant status was categorized into Absence (BDI = 0-13) or Presence (BDI = 14-60) of depression. Data analyses included descriptive statistics, bivariate analysis, and stepwise logistic regression. About 45% of students reported having mild-to-severe depression. The significant risk indicators for depression were: gender, recent loss of family members, type of study, year of study, presence of psychological illnesses, social life, satisfaction with each of the following: the specialty, teaching staff, college facilities. The regression model showed the following factors to remain significantly related to depression: presence of psychological illness, social life style, recent loss of family member, and satisfaction with teaching staff. In conclusion, a significant number of undergraduate students have depression. This study indicates the need to support this group of students by the community and the university administration. Students' academic and social advisers' roles are recommended to be more effective. Teaching staff are recommended to have their teaching and communication skills enhanced.

Keywords: Beck; Depression; science; student; undergraduate.

Gender-specific oral health beliefs and behaviors among adult patients attending King Abdulaziz Medical City in Riyadh.

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The Saudi Dental Journal, 2018 Jul; 30(3):226-231.

Aim: To explore variations in males' and females' oral health beliefs and behaviors and to assess the influence of oral health beliefs on their related behaviors within each gender.

Materials and methods: A cross-sectional study was designed to obtain information from patients attending outpatient clinics of King Abdulaziz Medical City, Riyadh, Saudi Arabia. Of the 553 self-reported questionnaires, 519 were filled comprising 251 males and 268 females. The questionnaire consisted of two parts: six demographic questions and 25 questions assessing oral health beliefs and behaviors. The statistical analysis was done using frequency distribution and chi square tests.

Results: Comparing males with females, there was no significant gender difference in beliefs. However, when it comes to behaviors, females were found to act more positively than males in many assessed oral health aspects of the study. When comparing beliefs versus behaviors towards the importance of oral health styles, a gap of 12-45% was noted between those "who believe of oral health behaviors" and those "who actually practiced them".

Conclusions: The study presented valuable information about the differences between beliefs and behaviors of Saudi population. It also indicated that females in general, acted more positively toward oral health than males. Health care providers might need to focus more on the improvement of oral health behaviors and practices especially among males. The real reasons for lack of behaviors need further investigation. Furthermore, oral health campaigns should switch focus from people's education to oral health practices and actions.

Keywords: Behavior; Belief; Gender; Health; Oral; Specific.

A Study of Evidence-Based Practice Level, Knowledge and Implementation amongst Health Care Practitioners in Riyadh City Hospitals.

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Int'l Conf. Health Informatics and Medical Systems, HIMS'18, 2018 Aug;35-38

Abstract: Evidence-based practice (EBP) requires physicians, dentists and health care practitioners to investigate, value and incorporate research literature with clinical experience and patient' perspectives. EBP is expected to creates a new decision-making approach and policies that positively impact all fields of healthcare and clinical domain. Currently, few studies were carried out about EBP at Saudi hospitals and medical and dental staff attitudes to EBP. Little is known about their awareness and implementation levels of EBP, existing and available resources to them for implementing EBP in their daily practice at their hospitals. In this research, we present early results of our study for levels of awareness, knowledge of EBP, and Level of practice and implementation of EBP at two dental Saudi hospitals namely: King Saud Medical City dental hospital and college of dentistry hospital at King Saud university in Riyadh, Saudi Arabia. A questionnaire was developed and distributed for seeking information about EBP issues among medical staff of this research study. The findings of this study show that using EBP approach in Clinical tasks context has an overall average equals to 61.1% of all participants. Awareness about "evidence-based dentistry and medicine is relatively reasonable, as about (56.8%) agreed that they have good understanding of it.

Index Terms: Evidence based practice in clinical practice, Evidence based practice in Saudi Health System.

Scores of awareness and altruism in organ transplantation among Saudi health colleges students-impact of gender, year of study, and field of specialization.

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Saudi Journal of Kidney Diseases and Transplantation, 2018 Sep;29(5):1028-1034.

Abstract: This study aimed to evaluate the awareness of organ transplantation and willingness to donate among Saudi Health Colleges students and the impact of gender, year of study, and field of specialization on this. This is a cross-sectional survey-based study. The survey was distributed to all the students attending the annual national conference of Saudi Health Colleges students held in 2018. The survey had two parts. The first part collected the information about gender, university, college of specialization, and year of study. The second part asked 10 questions, seven of which were about the types, causes, treatment of organ failure (awareness questions), and three of which were about their willingness to donate (altruism questions). The participants had three response options: "Yes", "No" and "I don't know. Descriptive statistics (mean, standard) and the frequencies were generated for each parameter. Categorical data were compared using Chi-square and continuous data using an independent t-test or paired t-test. A total of 821 respondents completed the questionnaire; 58.1% were female, 41.3% studying medicine, 25.1% applied medical sciences, 12.7% pharmacy, 9.6% dentistry, and 4.5% nursing 4.5%. The overall awareness of the correct responses constituted 60.4% while 12.3 % gave incorrect responses and 27.3% did not know what the answers were. The highest awareness score was about the concept of brain death (86.4%). The overall awareness score was significantly higher than the altruism score (62.7% and 45.7% respectively (P = 0.0001). Female respondents proved more aware than the male respondents in all the questions did. However, the differences reached the significant levels in four of the ten questions. If we split and summate the responses into "awareness" questions and "altruism" questions, we find that, although female students score higher in both categories, this reaches the significant level for the altruism score (59.90% vs. 45.60% (P = 0.0001). Final year students were significantly more aware than the freshmen in seven of the 10 questions posed with the biggest gap seen in the awareness that Islamic Sharia permits donating organs after death (82.3% vs. 49.6% (P = 0.0001). When we compare of responses by the college, we find that significant differences between the College of Medicine students and applied medical sciences in two questions with the former having a higher awareness score. The overall awareness score was significantly higher than the altruism score (62.7% and 45.7% respectively). Female students have higher altruistic score than male students. The scores are significantly higher in the senior students than in the junior ones.

Choice of Dental Specialties among dental students and associated influencing and motivating factors in Saudi Arabia.

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Journal of Health Informatics in Developing Countries, 2018 Nov;12(2):1-20.

Background: Healthcare providers including dentists reserve a significant role in the society. The oral health of a community mainly relies on dentists and specialists in the field. Therefore, the choice of dentistry as a career and selecting specialty and continuing Postgraduate Dental Education is an important milestone in an individual's life which ultimately affects his social status and financial stability. The aim of this study is to investigate motivating factors that influence and inspire students in choosing a dental specialty.

Methodology: A cross sectional study was conducted on a sample of 600 dental students and graduates from different universities in Riyadh, Saudi Arabia. The data was collected through an online questionnaire, disseminated on Twitter with convenience sampling technique while Cluster simple random technique was used for targeting colleges. Data was analyzed using SPSS version 16. Arithmetic mean and standard

deviation was calculated for quantitative data, chi-square and Fischer Exact test to compare categorical data. For comparing numerical data, Mann-Whitney test, Kruskal -Wallis test, student`s t-test and ANOVA test were used. Additionally, factor analysis and regression analysis were used to group common items and identify their effect after controlling other predictor variables.

Results: The results of the study show that many of the students want to pursue their career in dental subspecialty from an international program however, prefer to work as a civilian dentist in the public sector. Oral maxillofacial surgery was the most wanted career choice followed by Orthodontic, dentofacial orthopedics, restorative and cosmetic surgery in males and pediatric surgery in females. For these, salary aspects and cost of living expenses were the influencing factors. Moreover, six factors for motivation were obtained and significance was achieved against a variety of socio-demographic factors including job and financial security, family encouragement, inspiration from other people, and flexibility in working hours.

Conclusion: Dentistry is a well-known field of science and dentists require appropriate opportunities and guidance for enhancement of their career whether academic education or clinical sub specialty. Therefore, keeping in view the factors which motivates and influences their decision of choosing dental career, professional development guidance and mentoring should be provided at the university level.

Keywords: Dental students, oral maxillofacial surgery, influencing factors, factor analysis, Riyadh

The effectiveness of introducing detection cameras on compliance with mobile phone and seatbelt laws: a before-after study among drivers in Riyadh, Saudi Arabia.

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Injury Epidemiology, 2018;5(1):31.

Background: Because Saudi Arabia (SA) has struggled with the burden of Road Traffic Injuries (RTIs) for decades, a new automated citations system was implemented in 2018 to improve compliance with seatbelt and mobile phone laws. Therefore, the purpose of this study is to evaluate the impact of the system on the prevalence of seatbelt and mobile phone use among drivers in Riyadh. This is an observational study conducted between 2017 and 2018. A Pre-Post evaluation was employed to determine the impact of a camera detection system on seatbelt and mobile phone use. Two research coordinators collected the observations at several highways and inner intersections around Riyadh ($n = 3400$). We evaluated differences in the prevalence of seatbelt and mobile phone use across the two time periods using a chi-2 test. In addition, we evaluated the association between the new intervention and traffic violation using a logistic regression model.

Results: The overall seatbelt compliance increased significantly from 33.9% (95% CI = 31.7–36.2) to 75.8% (95% CI = 73.7–77.8; $P < 0.01$). In addition, mobile phone use declined significantly from 13.8% (95% CI = 12.2–15.5) to 9.8 (95% CI = 8.8–9.1; $P < 0.01$). We found the detection system to be associated with a significant increase in seatbelt use and also a significant decline in mobile phone use while driving. After implementing the intervention, drivers were 6.1 times (OR = 6.1, 95% CI = 5.2–7.0) more likely to wear seatbelts than before the technology went into effect. Similarly, drivers observed after implementing the cameras were 32% (OR = 0.68, 95% CI = 0.55,0.84) less likely to use mobile phones while driving than those seen prior to the intervention.

Conclusions: This study found a significant reduction in traffic violations following the implementation of a camera detection system in Riyadh. This positive impact is evidence for the role preventative structural strategies play to improve traffic safety and reduce RTI in SA. Therefore, these findings may facilitate further support for policymakers that public health interventions play a significant role to improve traffic

safety. Seatbelt and mobile phone use while driving should continue to be monitored, and traffic police may evaluate whether increasing the fine is associated with a significant reduction in traffic violations and associated crashes.

Keywords: Road traffic injuries, Motor vehicle crash, Mobile phone, Seatbelt, Detection cameras, Saudi Arabia

Dental Research Design (Book)

Azzam Al Jundi, Hicham Riba

Riyadh: Alshegrey, ISBN:978-603-91096-2-4, 2018, 303p.

Teaching and research are essential for the progress of human civilization. Teaching polishes talents and talents produce quality research to find out what is not known and indorse what is known. Investigative studies enrich knowledge and turn today's impossibility into tomorrow's reality. The current advancement of dental sciences has been possible only through continuous eminent research projects. Many students and dentists want to do research but simply feat to start due to the scarcity of basic understanding of dental research. This book was published to help those who are seeking guidance in designing such a project and to provide the basic information related to dental research methodology. The information gathered in this book will, hopefully, encourage students, practitioners and faculty members to work in a scientific way to design quality research in the dental field. It is true that one can never five complete knowledge in a book but we tried to make it as relevant and simplified as possible. Future editions will be benefit from your kind feedback.

Is Trying to Quit Associated with Tooth Loss and Delayed Yearly Dental Visit Among Smokers? Results of the 2014 Behavioral Risk Factor Surveillance System.

Shatha S. ALHarthi, ***Sarah K. Al-Motlag***, Monika M. Wahi

Journal of Periodontology, 2017 Jan;88(1):34-49.

Background: The rate of periodontitis in the US population has been estimated to be close to 50%. Patients with periodontitis, especially those who smoke, suffer from a high rate of tooth loss. The purpose of this analysis is to evaluate predictors of poor oral health and oral health habits among smokers and determine if trying to quit smoking is associated with better oral health or oral health habits in smokers in the United States.

Methods: Data from the 2014 Behavioral Risk Factor Surveillance System (BRFSS) were used in the analysis. After limiting the dataset to smokers, the designated exposure was respondent's report of trying to quit smoking (yes/no). Two logistic regression models were developed. One model identified factors associated with having a most recent dental visit longer than 1 year before the survey. The second model identified factors associated with loss of six or more teeth. Both models were controlled for confounding factors.

Results: After controlling for confounding, among smokers in the 2014 BRFSS, trying to quit was associated with significantly lower odds of respondents having their most recent dental visit longer than a year before the survey (odds ratio [OR]: 0.93; 95% confidence interval [CI]: 0.90 to 0.97) and was a significant risk factor for having lost six or more teeth (OR: 1.06; 95% CI: 1.02 to 1.10).

Conclusions: Among smokers in the United States, trying to quit is associated with compliance with yearly dental visits and higher odds of lost teeth. Future research should investigate optimal approaches for providing smoking cessation services in the dental setting.

Keywords: Behavioral risk factor surveillance system; periodontitis; risk factors; smoking; smoking cessation; tooth loss.

Oral Health Status and Oral Health-related Quality of Life among Hospitalized and Nonhospitalized Geriatric Patients.

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The Journal of Contemporary Dental Practice, 2017 Mar;18(3):228-234.

Introduction: The purpose of this study was to compare the oral health status and its effect on the oral health-related quality of life (OHRQoL) of hospitalized and nonhospitalized elderly patients in a single community. The null hypothesis for the study states that there is no difference in the oral health status and OHRQoL between hospitalized and nonhospitalized elderly patients.

Materials and methods: This study was conducted at the King Khalid Hospital and College of Dentistry, King Saud University, Riyadh, Kingdom of Saudi Arabia. A total of 99 (43 - hospitalized and 56 - nonhospitalized) geriatric patients participated in this study. Oral health-related quality of life was estimated using the geriatric oral health assessment index questionnaire. Decayed, missing, and filled teeth (DMFT) index and plaque index were used to assess the oral health status of the study participants.

Results: The mean age of the study participants was 68.2 years; 17.2% were females and 82.8% were males. There was no significant difference between hospitalized and nonhospitalized patients in OHRQoL and DMFT index. However, the oral hygiene status was better among nonhospitalized patients as compared with hospitalized patients.

Conclusion: There was a significant difference in the oral hygiene status between hospitalized and nonhospitalized geriatric patients.

Clinical significance: Caregivers must be sensitized to the importance of oral health for the elderly population, and oral health should be considered an integral component of general health.

Keywords: Geriatric health service; Oral health; Quality of life Saudi Arabia.

Satisfaction, Awareness and Attitude about Oral Aesthetics among Female High School Students in Riyadh, Saudi Arabia: A Cross-sectional Study.

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Journal of Oral & Dental Health, 2017 Apr; 1(1):1-5.

Introduction: Aim of the study is to determine the level of dental satisfaction, awareness, and attitude among 3rd year female high school students of Riyadh. As it is important to detect the level or awareness and attitude at young age so that they all can benefit more from the early treatment plan and as females are more conscious towards overall aesthetic we therefore aimed to recruit female participants only in order to evaluate the level of concerns regarding oral aesthetics.

Methods: A cross-sectional study was conducted among 501 female students in 6 different high schools of Riyadh. A structured questionnaire was used to identify the students' score about the level of satisfaction, awareness, and attitude towards their dental appearance. The results and statistics were carried out by using the SPSS software version 20.

Results: Among those surveyed, (82.2%) were satisfied with their dental appearance, (81.6%) had good awareness and (58.9%) had negative attitude. The most undergone treatment among the students was orthodontic treatments (62.6%). The most desired treatment was teeth whitening (52.8%) followed by orthodontic treatments (18.2%). The mother's level of education and income were significantly related to the awareness level (0.001 and 0.004 respectively).

Conclusion: Through this cross-sectional study conducted on 501 female students we concluded that more than three fourth of the students were satisfied with their dental appearance and are aware about the oral health; however, more than half had negative attitude towards the oral aesthetics. Mother's level of education and family income were related to awareness level of the students. Strategies should be formulated based on evidences to improve the attitude of young students towards dental aesthetics.

Attitudes of Dental Professional Staff and Auxiliaries in Riyadh, Saudi Arabia, Toward Disclosure of Medical Errors.

Nora S. Al-Nomay, Abdulghani Ashi, Aljohara Al-Hargan, Abdulaziz Alshalhoub, Emad Masuadi.

The Saudi Dental Journal, 2017 Apr;29(2):59-65.

Aim: To collect empirical data on the attitudes of dental professionals and dental auxiliaries in Riyadh, Saudi Arabia, regarding the disclosure of medical errors.

Methods: A cross-sectional study was conducted, involving the administration of a questionnaire to a sample of 586 participants recruited from over 10 government and private dental institutions in Riyadh between August 2015 and January 2016. The questionnaire collected information regarding participant opinions on (a) personal beliefs, norms, and practices regarding medical errors, (b) the nature of errors that should be disclosed, and (c) who should disclose errors.

Results: Most (94.4%) participants preferred that medical errors should be disclosed. However, personal preferences, perceptions of the norm and current practices with respect to which type (seriousness) of error should be disclosed were inconsistent. Only 17.9% of participants perceived that it was the current practice to disclose errors resulting in "Major harm". Over 68% of respondents reported a personal belief, a perception of the norm and a perception of current practice that errors should be disclosed by the erring dentist. Participants at government institutions were more likely to disclose errors than those at private institutions. There were also significant differences in the responses with respect to gender, age, and nationality. The implications for the development of guidelines to help Saudi dentists adopt ethical courses of action for the disclosure of errors are considered.

Conclusions: (1) The majority of participants personally believed that errors should be disclosed, (2) there was little agreement between participant personal beliefs and perceptions of the norm and practice with respect to which type of errors should be disclosed, (3) there was strong agreement that the erring dentist is responsible for reporting errors, and (4) the attitudes of the participants varied with respect to type of institution, age, gender, and nationality.

Keywords: Medical error, Dental error, Disclosure of medical error, Medical ethics

Critical Appraisal of Clinical Research.

Azzam Al-Jundi, Salah Sakka.

Journal of Clinical and Diagnostic Research: JCDR, 2017 May;11(5):JE01-JE05.

Abstract: Evidence-based practice is the integration of individual clinical expertise with the best available external clinical evidence from systematic research and patient's values and expectations into the decision making process for patient care. It is a fundamental skill to be able to identify and appraise the best available evidence in order to integrate it with your own clinical experience and patients values. The aim of this article is to provide a robust and simple process for assessing the credibility of articles and their value to your clinical practice.

Keywords: Evidence-based practice, Method assessment, Research design

Factors Influencing the Career Choices among Medical University students of King Saud bin Abdulaziz University, Riyadh Saudi Arabia; A Cross-sectional Study Design.

Abeer Al Subait, Anna Ali***, Anas Ibrahim Andijani, Mohammed Ali Altuwaijry, Saeed Mohammed Algarni, Tariq Saad Alduhaimi, Yazeed Mohammed Alotaibi,*** Ashraf El Metwally

The Saudi Journal for Dental Research, 2017 Jul;8(1):73-78.

Aim: This study investigated the factors that influence career choice among second year dental, medical and nursing students at King Saud bin Abdulaziz University for Health Sciences.

Methodology: One hundred and fifty questionnaires were distributed to 2nd year pre-professional medical, dental and nursing students (50 questionnaires per group). First part of questionnaire was regarding demographics and in the second part consisted of 23 factors that might influence the students' career choices which were divided into six dimensions namely social status, economy, profession, vocation/service, interest in science/education, and personal background.

Results: We received 119 completed questionnaires (medical = 40, dental = 40 and nursing = 39) with the response rate of 79.3%. We found that the social status of being a doctor or a dentist motivated medical and dental students compared to being a nurse for nursing students and the difference was significant among three groups (*P* value: 0.01). Furthermore, dental students when compared to both medical and nursing students were more likely to be motivated by factors related to profession that were job security, flexible timings and many others. On the other hand, with regard to factors relating to personal background, medical students showed lower motivation in comparison with dental and nursing students. Nevertheless, the difference in attitude related to personal background was significantly different among three groups (*P* value <0.01).

Conclusions: Through this study we concluded that factors related to professional security, personal background influenced the career choices of pre-professional medical, dental and nursing students. However, we cannot generalize the finding as it was done in one hospital of Riyadh. Nevertheless, this study was able to provide valuable information on the reasons for choosing a professional career among Saudi Arabian students. Further multicenter studies are needed to build upon the findings of the current study.

Keywords: Career choice, University students, Interest in science/education, Attitude

School Dental Preventive Program in National Guard Saudi Arabia

Ali Alehaideb, Mohammed Al Ousami, Anna Ali, ***Abeer Al Subait***

Journal of Oral and Dental Health, 2017; 1(1):1-3.

Abstract: School dental preventive program SDPP is a recent development occurred in Ministry of National Guard Saudi Arabia to provide preventive and curative care to the school going age children. SDPP has started in 2007 and is providing education, preventive and curative treatment to more than 15000 children. The program also includes school surveys and education about healthy nutrition programs by rationalizing the consumption of sugar and the quality of food provided to children in schools and reducing sugars and sugar-sweetened beverages. The program also includes fluoride and pit and fissure sealants and restorations for decayed teeth along with teaching proper brushing technique. SDPP encourages the effective use of portable dental units for the delivery of preventive care to children in schools without the need for children to go to dental clinics. This report highlights the importance of preventive dentistry that should be encouraged and practiced worldwide.

Knowledge, Attitudes, and Practices Related to Oral Health among University Students in Saudi Arabia; a Cross-Sectional Study.

Abeer Al Subait, Anna Ali***, Ali Alehaideb, Abdulrahman Alshebel, Abdulwahad Alqahtani,*** Ashraf El-Metwally

Journal of Dentistry & Oral Disorders, 2017 Dec; 3(6): 1080.

Aim/Objectives: The aim of this study is to evaluate the level of knowledge, attitude, and practice related to oral hygiene of the second-year pre-professional students at King Saud bin Abdulaziz University for Health Science.

Methodology: Cross sectional study with questionnaire survey. The sample size was 250 and the target population was the second year pre-professional students. The students were randomly selected. Chi-square, t-test, and ANOVA statistical tests were used.

Results: Females had significantly better knowledge, attitude, and practice compared to males. Dental students had better knowledge when compared to the other groups. Dental students had better knowledge about plaque (43.3%) compared with medical (29.1%) and nursing (25.0%) students (P value=0.006). Almost two-third of the students were using fluoride containing toothpaste (58.4%) with medical students (61.6%) being more than both nursing (56.2%) and dental (53.3%) students (P value= 0.029).

Conclusion: In this study, female students had better knowledge, attitude and practice compared with male students. When comparing between the various specialties, dental students had significantly better knowledge about oral hygiene practices compared with the other groups. Further research in a more diverse population is recommended to expand on the findings of this study.

Keywords: Knowledge; Attitude; Practice; Oral; Health

Evidence Based Dentistry skills.

Azzam Aljundi, Hicham Riba

World Journal of Experimental Bioscience, 2016 Jan;4:1-6.

Abstract: Decision-making based on reliable evidence is more likely to lead to effective and efficient treatments. Evidence-based dentistry was developed, similarly to evidence-based medicine, to help clinicians apply current and valid research findings into their own clinical practice. Interpreting and appraising the literature is fundamental and involves the development of evidence-based dentistry (EBD) skills.

Keywords: Evidence-based dentistry, Evidence Based Practice, Critical appraisal

Knowledge and Attitude toward Oral Health Practice among the Parents in Riyadh City

Basim Almulhim, ***Bassam Alamro***

Journal of Indian Academy of Dental Specialist Researchers, 2016 Jan;3(1):14-16.

Introduction: Parents are directly responsible for the dental health of their offspring and can play an important role in preventing oral diseases in children. Parents and teachers are the significant persons that have a great influence on young people. Aim: To assess knowledge and attitude towards oral health practice among the parents.

Materials and Methods: The study design was cross-sectional study involving 303 participants male and female from Saudi Arabia and another Arab nationality. Electronic Questionnaires were distributed through popular social media involving Twitter, Facebook and some direct and indirect messages through the email.

Result: 85% of the parents agreed that primary teeth should receive the same care as the permanent teeth. Almost half of the participants reported that their children should start brushing in age less than one year. Majority of the participants (77%) had the right knowledge regarding the use of fluoride. The most common cleaning aid of the teeth is toothbrush.

Conclusion: Majority of the parents in the study showed the right level of knowledge regarding use of fluoride; this was also reported in many other studies. A high percentage of this study and other studies show that the parents care for their childrens' primary teeth similar to the care they would show to their permanent teeth.

Keywords: Attitude, children, knowledge, oral hygiene, parent

Oral Health Knowledge, Attitude and Behavior among Students of age 10–18 Years Old Attending Jenadriyah Festival Riyadh; A Cross-Sectional Study

Abeer A. Al Subait, Mohammed Alousaimi, Amritha Geeverghese, Anna Ali, Ashraf El Metwally

The Saudi Journal for Dental Research, 2016 Jan;7(1):45-50.

Introduction*:* Several studies have documented a high prevalence of dental problems among Saudi youth. In order to plan successful public health awareness campaigns it is essential to evaluate three domains related to oral health at the population level, namely knowledge, attitudes and behavior.

Objective*:* To assess the level and aspects of knowledge, attitudes, and behaviors related to oral health among school students who attended a major festival in the City of Riyadh.

***Methods**:* This survey followed a cross sectional study design. Study subjects were recruited randomly among Saudi nationals attending the Jenadriyah festival in Riyadh City in the year 2013.

***Results**:* The study population was composed of 287 participants of age 10–18 years. Around 67% students reported brushing their teeth daily. We found significant difference in brushing habit between genders (*P* = 0.001) with girls showing a better dental practice. Compared to boys, girls were more aware about bleeding gums (*P* value ⩽ 0.001), oral health effects general health (*P* value = 0.004) and importance of dental check-up (*P* value ⩽ 0.001). Compared to boys' girls were significantly more conscious about tooth color (*P* value = 0.05). Other attitudes toward dental health were not significantly different in-between genders.

***Conclusion**:* This population-based study among 15–18-year old students found that around two third of Saudi youth brush their teeth proportion which is similar to that reported among similar age groups 10 years ago. Through this study we recommended that evidenced-based effective dental awareness programs are needed in order to improve dental-related practice among that age group. Evaluations of ongoing campaigns in schools are needed to better understand factors that can facilitate translating improved knowledge and attitudes into changing practice.
Keywords: Oral health, Dental caries, Knowledge, Attitude, Saudi

Knowledge, Perception, and Attitude of Health Care Professionals towards ICH-GCP Guidelines in Saudi Arabia

Nora Saleh Al-Nomay

Avicenna, 2016 Feb;1:1-7

Background: There is a significant lack of research regarding the knowledge, perception and attitude of health care professionals towards compliance with Good Clinical Practice (GCP) within the entire Arabic world. The present study intends to assess health care professionals' knowledge, perception, and attitude towards compliance with the International Conference on Harmonization - Good Clinical Practice (ICH-GCP) guidelines.

Methods: A cross-sectional study was conducted at King Abdullah International Medical Research Center (KAIMRC) and King Abdulaziz Medical City (KAMC) in Riyadh. A self-administered questionnaire was used to assess the knowledge, perception, and attitude towards ICH-GCP in a sample of 78 health care professionals.

Results: The vast majority of the respondents 55(71%) were principal or co-investigators and 23(29%) were research coordinators. Almost all, 66(85%), of the respondents had received GCP training. Of 78 health care professionals, 98% reported that the research subjects provide voluntary consent and the study protocols give a clear and adequate description of the study procedures. 97% reported that GCP principles are followed in clinical trial studies and GCP compliant activities improve the quality of clinical research. Only 57% of the health care professionals reported that clinical research is a part of routine activities done in the clinic. 72% reported that they suffer from delay in the approval by the national IRB to start their research and 59% reported negative attitude towards the IRB approval process or monitoring and audit of the clinical trials.

Conclusion: The present study suggests that the level of knowledge and perception towards compliance with ICH-GCP are generally satisfactory among health care professionals who involved in clinical trials in Saudi Arabia.

Keywords: Good Clinical Practice, knowledge and attitude, Clinical trials; Saudi Arabia

Perception and Level of Satisfaction of Patients Seeking Dental Care; A Cross-Sectional Study in a Major Healthcare Center in Saudi Arabia

Abeer A. Subait, Anna Ali, ***Omar Alsammahi, Mohammed Aleesa, Saleh Alkashan, Mohammed Alsalem, Abdulelah Aldahash, Waleed Alfayez***, Ashraf El-Metwally.

Journal of Dentistry and Oral Disorders, 2016 Jun;2(4):1021, 1-5.

Introduction: Public awareness towards health in general is increasing throughout our community. Patient's are becoming more informed, sophisticated, and demanding. This study aimed to have an overview on how patients perceive dentist-patient relationship and to assess the level of satisfaction up patients seeking dental treatment at the National -amongst Saudi adult followGuard Health Affairs (NGHA) dental clinics.

Methods: Data was extracted from the questionnaires distributed to the patients in the waiting area of National Guard Health Affairs (NGHA) Dental Clinic.

Results: A total of 129 participants completed the questionnaire. It was found that most of the participants were satisfied with the overall health care services provided at NGHA dental clinic. A significant association was found between education and satisfaction level. The higher the education of the patient is, the lesser satisfaction ($t = 9.3$, $P = 0.003$). However, the mean difference in satisfaction level was not different between gender and among different socio economic status (P value =0.87, P value= 0.90) respectively.

Conclusion: In this cross-sectional study, we have found that the majority of participants were satisfied with the overall services provided in NGHA dental clinics. Gender and socio-economic difference did not influence the level of satisfaction however education was associated with it.Findings of our study can help us in the improvement ofthe health services at NGHA since patient satisfaction has a great impact on patient compliance which in turn improves treatment outcome. Future studies should be conducted in multi-center settings to assess the findings of community in general.

Keywords: Perception; Satisfaction; Dentist; Patient-dentist relationship

Perception of Dental Professionals towards Dental Errors in Saudi Arabia

Nora Al-Nomay

Journal of Public Health in Developing Countries, 2016 Aug;2(2):199-211.

Background: Dentists have an ethical responsibility to disclose their mistakes; however, there is considerable inconsistency on what dentists do after a dental error is committed, how much information they disclose, to whom they disclose this information and what they can do to prevent future errors. Although Saudi Arabia has started to establish risk management plans for dentistry, gaps still remain in achieving modern high quality healthcare standards. This study aims to provide empirical evidence on the perception of dental professionals, in an Arab/Islamic culture, towards dental errors.

Methods: A cross-sectional survey was conducted between August 2015 and January 2016 and involved 586 dental professional staff and auxiliaries. The data collection was undertaken using Twitter and face-to-face sampling from various medical cities and dental colleges in Riyadh, Saudi Arabia.

Results: The most frequent age-group was <30 years (62.1%) and the majority of the participants were Saudis (72.9%). The majority of the respondents perceived that dental errors happen mainly due to failures in processes and work structures, the dentist should report the error to the institution and the involved patient, discuss with colleagues, and make changes to minimize recurrences. There were, however,

significant differences in the responses to the survey with respect to different demographic groups of respondents.

Conclusions: This study provides critical information to assist the Saudi Ministry of Health to develop new ethical regulations for the disclosure of dental errors based on perceptions of dental professionals. The existing regulations contain limited information on the disclosure of dental errors.

Keywords: Dentistry, Dental errors, Medical ethics, Saudi Arabia

Decayed, Missing and Filled Teeth among Jordanian nursing home residents

Abed Al Hadi Hamasha

Journal of Disability and Oral Health, 2016 Sep;17(3):133-138.

Aim: To report on Decayed, Missing, Filled Teeth (DMFT) among Jordanian nursing home residents and to analysethe differences of these conditions among different socio-demographic, personal and dental characteristics.

Methodology: A convenience sample of 221 Jordanian nursing home residents with a mean age of 62.4 years(121 males and 100 females) from all nursing home residents in Jordan (297 subjects) were recruited to participatein this study. Subjects were interviewed and clinically examined for DMFT by a single trained and calibratedexaminer. Data were processed and analysed using SPSS software. Statistics included frequency distributions andnon-parametric tests. Kruskal Wallis and Mann-Whitney tests were used to analyse the differences in the meanDMFT among different independent variables.

Results: The mean number of missing teeth was 21.13 (32.6% of residents were totally edentulous). The meannumbers of DMFT were 4.0, 21.13, and 0.57, respectively (DMFT=25.72). DMFT among dentate residents wassignificantly higher in older age group, smokers and those with irregular tooth brushing and dental visits.

Conclusion: This study provided useful information on the DMFT status of Jordanian nursing home residents. Attention should be given by the general dental practitioner to the poor oral health status and the treatment needsthat nursing home residents might exhibit.

Keywords: DMFT, nursing home, Jordan

Public Preferences, Perceptions, and Awareness amongst Disclosure of Dental Professional Error in Riyadh, Saudi Arabia

Nora S. Al-Nomay, Abdulghani Ashi, Aljohara Al-Hargan, Abdulaziz Alshalhoub, Lubna Al-Nasser

EC Dental Science, 2016 Sep:5(1):981-991.

Aim: To investigate public preferences, perceptions, and awareness amongst disclosure of dental professional error in Riyadh, Saudi Arabia. Background: Medical errors, such as flawed practices of omission, commission, planning, and execution, are unsuccessful processes which may essentially result in adverse outcomes to the patients and their families, frequently occur in the practice of dentistry. However, studies regarding dental errors in dentistry are rarely conducted.

Objective: The study aims to determine 1) Which medical error to disclose to patients? 2) Who should disclose medical error to patients? and 3) Association between preference of dental error disclosure and who to disclose dental errors, and participants' demographics.

Materials and Methods: A sample of 655 dental patients were recruited from government and private institutions in Riyadh, in the period from August 2015 to January 2016. Data were collected via survey questionnaires consisting 6 demographic questions and 5 questions regarding dental errors. Chi-square goodness-of-fit tests, Chi-square tests of independence, and logistic regressions were employed for data analysis.

Results: Participants preferred to be informed about the dental errors regardless of the severity of the errors and have the dentist who committed the dental error disclose the information. Also, after experiencing dental errors, only around one-fourth of the participants would still accept the dental care from the same doctor and majority of the participants would feel scared after being disclosed with a dental error. There was a statistically significant relationship between preference of dental error disclosure, and gender, employment status, and education level. There was a statistically significant relationship between who to disclose the dental error, and nationality, gender, employment status, and education level.

Conclusion: The feedback from the participants provide the opportunities for the dentists and dental management to get a more in depth understanding of the patients' preferences regarding dental errors. In the light of the results of the study, dentists should be encouraged to disclose dental errors.

Keywords: Medical errors; Patient safety; Dental practice; Error disclosure; Saudi Arabia

Perception to Altered Smile Features of Saudi Dental Students at Different Academic Levels

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Journal of Dental Sciences, 2016 Sep; 4(3):136-145.

Purpose/Objectives: The aim of this study was to evaluate the perception of dental students towards altered smile esthetic parameters and the effect of abnormal deviations of these parameters.

Materials and Methods: A sample of 300 dental students was divided by gender into 150 males and 150 females. The sample was further subdivided based on the academic level from 1st year to 5th year. Twentyfour photographs with altered smile features were used. Altered features included gingival show upon smiling (GS), central incisor crown length (CL), midline shift (MS), and midline diastema (D). The photos were randomly presented to the participants. A form containing the visual analogue scale (VAS) was distributed to the students and used to rate the smile esthetics.

Results: Perceptions of dental students in different academic levels to GS alterations showed that Level 5 denoted a more unattractive rating than level 2 students (p-value<0.05). There was no significant difference between levels when the CL discrepancy was 1.5-2 mm. In the remaining discrepancies level 4 students was the most critical group. There was a significant difference between levels when the MS was 5 mm (p-value< 0.05). There was no significant difference among the levels when the D discrepancy was >0 mm.

Conclusions: Students at level four and five have been exposed to undergraduate orthodontic courses in their academic curriculum, which shifts their perception towards being more critical in their evaluation of altered smile features and approximating the general dentists and orthodontists groups.

Keywords: Perception, Education, dental, Academic level, Saudi students.

Protocol Writing in Clinical Research

Azzam Al Jundi, Salah Sakka

Journal of Clinical and Diagnostic Research: JCDR, 2016 Nov;10(11):ZE10-ZE13.

Abstract: Writing a research proposal is probably one of the most challenging and difficult task as research is a new area for the majority of postgraduates and new researchers. The purpose of this article is to summarize the most important steps and necessary guidelines for producing a standard research protocol. Academic and administrative success of any project is usually determined by acquiring a grant for the related field of research. Hence, the quality of a protocol is primarily required to achieve success in this scientific competition.

Keywords: Academia, Grant, Higher Education, Researcher

The Association Between Oral Health Literacy and Missed Dental Appointments

Jagan Kumar Baskaradoss

The Journal of the American Dental Association, 2016 Nov;147(11):867-874.

Background: In this study, the author identified associations among demographic characteristics, dental risk factors, health-seeking behaviors, oral health literacy level, and failure to keep dental appointments.

Methods: The author conducted an unmatched 1:2 case-control study at a university-based dental clinic from February through April 2015. The author used the Comprehensive Measure of Oral Health Knowledge questionnaire to record the oral health literacy of the respondents. The author obtained additional information about the various covariates using a questionnaire and checking the patients' electronic medical records. The author used a multivariate logistic regression analysis to test the associations between missed appointments and other risk factors in addition to oral health literacy.

Results: Data from 150 (50 case patients and 100 control patients) respondents were included in the analysis. The case and control patients were comparable in terms of sociodemographic characteristics and dental risk factors. The Comprehensive Measure of Oral Health Knowledge score was used to categorize the sample into low (≤ 18) and high (> 18) oral health literacy groups. Low oral health literacy was associated with a 2-fold increase in the risk of having missed appointments (adjusted odds ratio, 2.38; 95% confidence interval, 1.05-5.40). Age was also independently associated with missed appointments (adjusted odds ratio, 1.03; 95% confidence interval, 1.01-1.06).

Conclusions: After adjusting for the various demographic and dental risk factors, poor oral health literacy was found to be independently associated with missed dental appointments. Insights into the role of oral health literacy and clinic attendance could play an important role in addressing the problem of missed dental appointments.

Practical implications: Considering the effects of missed appointments on treatment outcomes, predictors of patient compliance behaviors may be useful in circumventing cancellations and no shows.

Keywords: Health knowledge; attitudes; health literacy; oral health; patient appointments; practice.

Dental Research – Principles and Methodology. (Book)

Azzam AlJundi, Hicham Riba, Jagan Baskaradoss.

Deutschland: Lambert Academic Publishing; ISBN: 978-3-330-0182-1, 2016, 199p.

Summary: "Dental Research- Principles and Methodology" provides a comprehensive overview of the concepts in dental research. The scope of this book is wide and covers areas like Ethics, Scientific writing, Statistics and Research design and methodologies. This book includes several sections on the principles of scientific evidence and research methodologies that would empower a dental student to gain an in-depth understanding of this very important topic. This book provides a perfect introduction for dental students to the practice of Evidence Based Dentistry. For practitioners, especially those dentists involved in the growing number of research networks, this book provides the basic knowledge on research methodologies and how to apply them in dental research. The text is written in an easy, narrative style that facilitates learning.

Review of the Legal Maxims of Islamic Law on Palliative Sedation: Concerns of the Arabic Bioethicists

Nora S. Al-Nomay, Isamme N. Alfayyad

Journal of Public Health in Developing Countries, 2015; 1(2):83-88.

Abstract: The complexity of symptoms of terminally ill patients can present an unendurable experience at the end of life. One contested issue sits at the forefront of end of life care, which is the palliative sedation. Palliative sedation is a medical practice that is acknowledged and used as a last resort or controlling refractory symptoms. It has received considerable global attention lately, but has not been adequately addressed in Islamic literatures within the Arab world. The tension around palliative sedation is grounded in competing concerns. The first concern, alleviation of the suffering of a human being, is considered very righteous. The second concern, maintaining a level of consciousness as close to normal as possible, is of great importance to allow for the observance of the worship rites for the longest period possible before death. The third concern is the absence of Islamic rules that particularly legalize or prohibit palliative sedation. This study, therefore, attempts to examine the legal status of this practice and explore the Islamic rules and ethical boundaries that might govern it. In-depth qualitative studies to affirm and expound any ambiguity in the definition and the practice of palliative sedation are urgently needed.

Keywords: Terminal illness, Palliative sedation, Decision making, Islamic law, Saudi Arabia,

Compliance with the ICH-GCP Guidelines among the Saudi Health Care Professionals: Should Saudi Arabia Conduct Widespread ICH-GCP Training?

Nora Saley Al-Nomay

Journal of Public Health in Developing Countries, 2015;1(2):75-82.

Background: The guidelines governing the relationship between industry and medical institutions are clear in Saudi Arabia, but there are various deficiencies in the conduct of clinical trials in Saudi Arabia. The purpose of this study is to assess compliance with the International Conference on Harmonization - Good Clinical Practice (ICH-GCP) guidelines among the health care professionals at the King Abdulaziz Medical City (KAMC), Riyadh, Saudi Arabia.

Methods: A cross-sectional survey was conducted at the KAMC. A questionnaire was administered to health care professionals involved in clinical trials between February 2014 and March 2015.

Results: The study shows poor compliance with the ICH-GCP principles. None of the 78 respondents responded correctly to various questionnaire items. The correct responses ranged from 40% to 90%. The research coordinators had better compliance with the ICH-GCP compared to the principal investigators (PIs) or the coinvestigators (69.6% vs. 20%, p-value=0.001). Females (55.6% vs. 23.5%, p-value =0.005),

and non-Saudi participants (45.5% vs. 20.6%, p-value =0.022) had better compliance. Multivariate logistic regression showed that the odds of compliance with GCP were 33.6 times higher among the research coordinators compared to the PIs or co-investigators.

Conclusion: The study suggests that Saudi Arabia must conduct widespread ICH- GCP training to encourage better compliance among the Saudi researchers.

Keywords: ICH-GCP guidelines, Clinical trails, GCP compliance, Training, Saudi Arabia

Public Knowledge of Tooth Bleaching in Riyadh, Saudi Arabia

Nora S. Al-Nomay, Anwar E. Ahmed, Aljohara Al-Hargan, Abdulgahni Ashi, Abdulaziz Alshalhoub

Journal of International Oral Health, 2015;7(12):27-32.

Objective: To address the awareness of tooth bleaching in Saudi Arabia by administering several research studies concentrated on students in secondary schools or universities. However, the current investigation tends to address the knowledge of tooth bleaching only among residents of Riyadh city.

Methods: A cross-sectional study was conducted on 602 adults residing in Riyadh, Saudi Arabia. Participants of the study were selected based on the cluster sampling technique. Data about demographics and knowledge toward tooth bleaching were collected using an Arabic survey.

Results: Of 602 respondents, 4.8% had never visited a dentist, and 12.8% rated their knowledge about teeth whitening as poor. Poor responses were noted, and only 16.4% reported avoiding tea, coffee, and smoking after teeth whitening. According to the assessment, the knowledge about teeth bleaching was below average (43.9 ± 20.5). Female respondents had considerably more knowledge of teeth bleaching compared to male respondents (55.58 ± 17.49 vs. 34.73±17.79, P= 0.001). Knowledge of teeth bleaching tends to decrease as age increases (P = 0.001). Non-smokers were found to have more knowledge of teeth bleaching than smokers (45.54 ±20.44 vs. 33.40 ±17.37, P = 0.001). Respondents who never visited a dentist had significantly less knowledge of teeth bleaching as compared to those who frequently visited a dentist (35.54 ± 16.37 had never visited a dentist, 34.87 ± 19.09 had 1-5 dentist visits, 47.30 ± 20.14 had frequent dentist visits, P = 0.001). According to multivariate linear regression, females tend to have increased knowledge of teeth bleaching by 15.939 (P = 0.001), respondents with a university degree tend to have increased knowledge of teeth bleaching by 7.913 (P = 0.001), and respondents with frequent dentist visits tend to have increased knowledge of teeth bleaching by 5.702 (P= 0.001). On the other hand, smokers tend to have decreased knowledge of teeth bleaching by 4.532 (P = 0.039).

Conclusion: Female respondents, young respondents, non-smokers, respondents with frequent dentist visits, and respondents with education were associated with higher levels of knowledge toward tooth bleaching.

Keywords: Knowledge, Riyadh, Saudi Arabia, tooth bleaching, tooth whitening

Water Pipe Use and the Awareness of its Effect on Oral Health in Riyadh, Saudi Arabia

Nora S. Al-Nomay, Anwar E. Ahmed,

Journal of Oral Hygiene & Health, 2015 Dec;3(6):1-5.

Objective: Despite widespread water pipe (WP) use in Saudi Arabia, research on WP use and the awareness of its effect on oral health in Riyadh, Saudi Arabia are limited. This study attempts to calculate

the prevalence of WP use and discover the awareness level regarding its effect on oral health in a sample collected from Riyadh City.

Method: A total of 602 residents in Riyadh, Saudi Arabia were selected by cluster sampling from the five largest shopping malls in Riyadh. Data were collected using an Arabic questionnaire with demographic characteristics.

Results: The majority of the participants were aware that WP smoking is a risk factor for oral cancer, periodontal diseases, bad taste, tooth and oral tissue staining, and bad breath. However, the prevalence rate of WP use was 16.9% with 95% confidence intervals (14.03% - 20.18%). WP use was more prevalent among the male gender (22.3% in males vs. 10.2% in females, P-value = 0.001), cigarette smokers (38.0% in cigarette smokers vs. 13.8% in non-cigarette smokers, P-value = 0.001), and people who avoided dental visits (31% never visited a dentist, 25.9% had 1-5 visits vs. 13.2% who had 5 or more visits, P-value = 0.001).

Conclusion: The primary WP usage in Saudi Arabia came from the male gender, cigarette smokers, and people who avoided dentist visits. Anti-WP smoking interventions that target the male gender and cigarette smokers are needed to prevent WP use among these subjects. Future study may be warranted to move beyond oral health, thoroughly grasp the motives of WP users relative to cardiovascular risk, and lead the way toward creation and implementation of a CVD intervention program.

Keywords: Water pipe smoke; Muassel; Oral health; Cigarette smoke; Saudi Arabia

Effectiveness of a Dental Stress Management Program

Abdullah Alzahem, Henk T. Van der Molen, Benjamin J. De Boer

Health Profession Education 2015, Dec;1(1):34-42.

Abstract: The dental education stress effects and sources were explored thoroughly in the literature, but the effectiveness of stress management programs received less attention. This study introduced a new stress management program, named Dental Education Stress Management (DESM) program. It showed its effectiveness in a quasi-experimental pretest-posttest-follow-up-control group design. The new program was based on the principle of psychoeducation and consisted of three 90-min sessions, to teach dental students how to better deal with their stress symptoms and to reduce their general stress level. Two instruments were used to assess the level of stress of the dental students, namely the Dental Environment Stress questionnaire (DES), and the Psychological Stress Measure (PSM-9). Results show that the DESM program has the desired effect of decreasing the stress levels of its participants, and these effects lasted for at least two weeks. Because of several methodological limitations of the study more research is needed to draw more generalizable conclusions.

Keywords: Dental education, Dental students, Stress, Stress management program

Assessing the Current State of Dental Informatics in Saudi Arabia: The New Frontier

Lubna Al-Nasser, ***Ali Al-Ehaideb***, Mowafa Househ

Studies in Health Technology and Informatics, 2014 Jan;202:165-168.

Abstract: Dental informatics is an emerging field that has the potential to transform the dental profession. This study aims to summarize the current applications of dental informatics in Saudi Arabia and to identify the challenges facing expansion of dental informatics in the Saudi context. Search for published articles and specialized forum entries was conducted, as well as interviews with dental professionals familiar with

the topic. Results indicated that digital radiography/analysis and administrative management of dental practice are the commonest applications used. Applications in Saudi dental education included: web-based learning systems, computer-based assessments and virtual technology for clinical skills' teaching. Patients' education software, electronic dental/oral health records and the potential of dental research output from electronic databases are yet to be achieved in Saudi Arabia. Challenges facing Saudi dental informatics include: lack of IT infrastructure/support, social acceptability and financial cost. Several initiatives are taken towards the research in dental informatics. Still, more investments are needed to fully achieve the potential of various application of informatics in dental education, practice and research.

Keywords. Dental informatics, Saudi Arabia, dentistry, Information Technology

Stress management in dental students: a systematic review

Abdullah M. Alzahem, Henk T. Van der Molen, Arwa H. Alaujan, Benjamin J. De Boer.

Advances in Medical Education and Practice, 2014 May;5:167-176.

Abstract: This study compared the effectiveness of stress management programs in dental education by systematic review of the literature. The number of studies concerning stress management programs for dental students is limited compared with studies discussing sources of stress. Several types of programs for stress management have been reported, and differ in their duration, content, and outcomes. Two main strategies have been used to help stressed students, ie, decreasing the number of stressors and increasing the ability to cope with stress. The first strategy includes several components, such as reducing fear of failure and workload pressure due to examinations and requirements. The second strategy includes coping techniques, such as deep breathing exercises. Although positive effects have been reported for most of the programs, these have mainly been evaluated using subjective self-report measures. There is a need for more research to identify the most effective stress management program.

Dental and medical practitioners' awareness and attitude toward evidence based practice in Riyadh, Saudi Arabia. A comparative study

Nahid Ashri, ***Haifa Al-Amro, Lubna Hamadah, Sahr Al-Tuwaijri***, Ashraf El Metwally

The Saudi Journal for Dental Research, 2014 Jul;5(2):109-116.

Objective: To determine and compare different levels of awareness and attitude toward Evidence-Based Practice (EBP) among dental and medical practitioners in Riyadh, Saudi Arabia.

Methodology: A cross-sectional study using a self-administered questionnaire was completed by 300 practitioners (150 dentists and 150 medical practitioners) working at different academic, governmental, and private sectors in Riyadh, Saudi Arabia. The questionnaire assessed practitioner's attitude toward EBP in terms of application and usage; awareness and usage of bibliographic database; history of training in EBP; perception of their understanding of technical terms used in scientific research and opinion with respect to barriers for the use of EBP and Evidence-Based Dentistry in Saudi Arabia.

Results: Of those who were invited to participate, 76.7% returned fully completed questionnaires. Physicians and dentists had an overall favorable attitude toward EBP, with 85% showing interest in the current promotion for this process and 97% agreeing that it improves patients' care. However, 55% believe that it poses extra demands on already overloaded clinicians. No significant differences were found between dentists and physicians with respect to all attitude items. Significantly fewer dentists indicated understanding the terms: number needed to treat ($P = 0.001$), odds ratio ($P = 0.007$), meta-analysis ($P = 0.02$) and confidence intervals ($P = 0.04$). Less than half of dentists and physicians received

formal training in search strategies (43.8%), critical appraisal (34.4%) and other EBP skills (40.6%), while only 38.8% (significantly lower among dentists; *P* = 0.009) reported using Evidence-Based Practice guidelines. Significantly more physicians reported having accessibility to Medline through their office computer (*P* = 0.003).

Conclusion: EBP has not been used to its maximum, despite excellent attitude toward its usage among both physicians and dentists. More efforts should be put into strengthening the skills and use of EBP among all medical practitioners, particularly among dentists, working in Saudi Arabia.

Keywords: Evidence, Awareness, Attitudes, Dentistry, Healthcare

Perceived causes of stress among Saudi dental students

Zeyad H. Al-Sowygh, ***Abdulmohsen A. Alfadley***, Mohammed I. Al-Saif, Saleh H. Al-Wadei

King Saud University Journal of Dental Sciences, 2013 Jan;4(1):7-15.

Abstract: Dental education programs must make every effort to balance the demands of academic and clinical training of students, provide a reasonable quality of life and adequately prepare them for the continuing stress involved in the profession. This challenge has led to considerable interest in identifying sources of stress for students in dental education programs. Our study was structured with a prime objective of determining the perceived causes of stress among undergraduate dental students of the academic year 2009–10, at the College of Dentistry, King Saud University, Riyadh, Saudi Arabia. Four hundred and twenty-five students participated with the overall response rate of 76.4%. This cross-sectional, questionnaire-based survey was carried out in the study population utilizing the 41-item modified Dental Environmental Stress (DES) scale, to assess the sources of stress and its severity. Descriptive statistics were calculated for severity and sources of stress. Results indicated that there was a positive recalibration of student perceptions in the areas of transition from preclinical to clinical level; “Performance pressure” stressed third year students the most. However, “Clinical requirements” was the greatest stressor with the highest mean for the fourth and fifth year students. The mean value of total DES score of female students is also statistically higher than that of male students ($p < 0.05$). The item scores “Patient treatment”, “performance pressure” and “social stressors” are significantly more stressful in married than in the single study subjects ($p < 0.05$). The overall findings of this investigation showed that dental students of King Saud University, perceived high levels of stress across all of the five study years with notable significance in the factor domain of “Workload”.

Keywords: Dental environmental stress questionnaire, Educational measurement, Psychological, Dental psychology

Prevalence of Malocclusion and its Relationship with Caries among School Children Aged 11-15 Years in Southern India

Jagan Kumar Baskaradoss, Amrita Geevarghese, Celment Roger, Anil Thaliath

The Korean Journal of Orthodontics, 2013 Feb;43(1):35-41.

Objective: To assess the prevalence of malocclusion and its relationship with dental caries among school children in southern India. **Methods:** This cross-sectional study included 1,800 students aged 11 - 15 years whose Dental Aesthetic Index (DAI) and dentition status were recorded and analyzed. The chi-square test, ANOVA, and Spearman's correlation tests were carried out.

Results: The mean DAI score ± the standard deviation was 18.61 ± 6.1. Approximately 85% of the students (83.0% males, 86.8% females) had DAI scores of < 26 and were classified as not requiring

orthodontic treatment. One tenth of the sample had mean DAI scores between 26 - 30 (indicating definite malocclusion and elective treatment), while about 3% had mean scores between 31 - 35 (indicating severe malocclusion and treatment desirability). Only 29 children (1.6%; 16 boys, 13 girls) had a DAI score of > 35, which suggested very severe or handicapping malocclusion requiring mandatory treatment. The mean decayed, missing, filled teeth (DMFT) was 2.28 ± 1.47. A DMFT of > 0 was observed in 91.8% of the study subjects. Children with a DAI score of > 35 were found to have significantly ($p < 0.001$) higher caries experience as compared to other children. Moreover, the DAI scores showed a significant correlation with the mean DMFT scores ($r = 0.368$, $p < 0.05$).

Conclusions: A positive correlation was found between the severity of malocclusion and dental caries.

Keywords: Oral hygiene, Epidemiology, Cariology, Orthodontic index

Effect of Year of Study on Stress Levels in Male Undergraduate Dental Students

Abdullah M. Alzahem, Henk T Van der Molen, Benjamin J De Boer.

Advances in Medical Education and Practice, 2013 Oct;4:217-222.

Objective: Stress among dental students can be a significant threat, resulting in physical and/or mental illness, and have a negative effect on students' performance and the professional practice of dentistry. Stress can occur from different sources. The purpose of this study is to test whether the year of study has an effect on the stress levels of dental students.

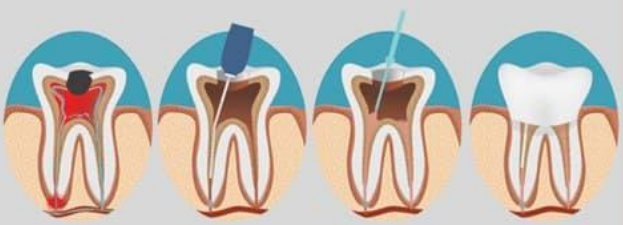
Method: Our study consisted of a cross-sectional survey using a modified version of the Dental Environment Stress (DES) questionnaire. The questionnaires were filled out by male undergraduate dental students at King Saud University in Riyadh City during the 2010–2011 academic year (n = 214).

Results: The results show the most common sources of stress: examinations and completing clinical requirements. Moreover, in the five-year lecture-based traditional curriculum, the third year students reported the highest level of stress, whereas the first year reported the lowest level of stress.

Conclusion: Third year undergraduate dental students reported the highest level of stress. This stress could be reduced by reviewing and modifying the dental curriculum by allowing students to have contact with patients more gradually, starting from the first year, in addition to adding stress prevention and intervention programs in dental curricula.

Keywords: dental, education, students, stress, study year

Endodontics



2.2 ENDODONTICS

Vertical Load and Torque during Post Space Preparation and their Influence on Microcrack Development

Ahmed Jamleh, Maryam Alghilan, Asma Alsharif, Nouf Alqahtani, Abdulrahman Aloqayli, Abdulkader Aljarrah.

Journal of Prosthodontics. 2021 May 22. Ahead to print

Purpose: To investigate, in vitro, the magnitudes of vertical load and torque generated during post space preparation of root canal treated teeth and their influence on microcrack development.

Materials and Methods: Forty extracted premolars with single canals were decoronated. The roots were prepared using ProTaper Next system (Dentsply Sirona) to X3 file, obturated, and provisionalized. After a 3-week incubation period, the roots were distributed into 2 groups according to the post drill system used (ParaPost fiber post and RelyX fiber post). During post space preparation, the vertical load, torque, and preparation time were recorded. Before and after the post space preparation, the roots were imaged with micro-computed tomography (SkyScan 1172; Bruker micro-CT) to detect new microcracks. The data were analyzed using the Mann–Whitney U-test and chi-square test.

Results: In ParaPost and RelyX, the post space was prepared in 48.31 ±25.28 and 47.71 ±13.36 sec, respectively (P = 0.360). The peak vertical load generated with ParaPost (20.23 ±7.80 N) was significantly lower than that of RelyX (29.43 ±5.82 N) (P = 0.010). The maximum torque attained with ParaPost (1.42 ±0.61 N.cm) was found to be significantly lower than that of RelyX (3.23 ±1.58 N.cm) (P = 0.000). No post drill fracture or visible deformation was noticed throughout the experiment. New microcracks were found in three ParaPost samples only.

Conclusions: The choice of post drill influenced the loads and torques generated during post space preparation. The ParaPost system showed favorably lower load and torque values during the post space preparation compared with the RelyX system.

Keywords; ParaPost fiber System, RelyX fiber post, vertical load, torque, microcrack

The Incidence and Intensity of Postendodontic Pain and Flareup in Single and Multiple Visit Root Canal Treatments: A Systematic Review and Meta-Analysis.

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Applied Sciences. Apr 2021; 11(8):3358.

Abstract: To assess the incidence and intensity of postendodontic pain and flareup in single and multiple visit root canal treatment (RCT) and determine if the difference between the two is significant, a search of PubMed, Medline, Embase, Cochrane, Scopus andWeb of science was conducted. The grey literature was searched using Google Scholar and Saudi digital library. Randomised controlled trials evaluating the incidence and intensity of postendodontic pain and flareup published in English from 1 January 2000 to 15 April 2020 were searched. The PRISMA protocol was followed to select the articles. A random effects model was used for the meta-analysis of the data in the included studies. Twenty-one articles were included in the review. Three compared both the incidence and the intensity, while the rest compared

either one of the parameters. Most studies used both hand-driven and rotary instruments and irrigated with sodium hypochlorite. Twelve studies used an intracanal medicament. Although individual studies showed discordant treatment outcomes, the meta-analysis did not reveal any significant difference in the incidence or the intensity of the postendodontic flareup between the single and multiple visit RCT groups. Single or a multiple visit root canal treatment is not an independent determinant for the risk of postendodontic pain or a flareup.

Keywords: endodontics; flareup; pain; root canal treatment; postendodontic pain

The effect of reduced glutathione on the toxicity of silver diamine fluoride in rat pulpal cells.

Seunggun Kim, Mohannad Nassar, Yukihiko Tamura, Noriko Hiraishi, ***Ahmed Jamleh***, Toru Nikaido, Junji Tagam.

Journal of Applied Oral Science, 2021 Apr;29:e2020859.

Introduction: Due to its ability to arrest untreated dental caries, silver diamine fluoride (SDF) has been advocated for indirect pulp capping procedures. However, the high concentrations of silver and fluoride in SDF raise concerns about its biocompatibility to pulpal tissues.

Objectives: This study aimed to investigate the effect of SDF on the viability, alkaline phosphatase (ALP) activity, and morphology of pulpal-like cells (RPC-C2A) and to evaluate the influence of reduced glutathione (GSH) on SDF-induced cytotoxicity and deposit formation on dentin. Methodology: The cytotoxicity of diluted 38% SDF solutions (10-4 and 10-5), with or without the addition of 5 mM or 50 mM GSH, was evaluated at 6 and 24 hours. Cell viability was detected using WST-8 and the effect on ALP activity was performed using an ALP assay kit. Cell morphology was observed using a phase-contrast microscope. Scanning electron microscopy analysis was conducted to evaluate the effect of GSH incorporation or conditioning on SDF-induced deposit formation on dentin discs. Cytotoxicity data were analyzed by two-way analysis of variance (ANOVA) and Tukey post hoc tests ($p<0.05$).

Results: There were significant differences between the groups. The results demonstrated that all tested SDF dilutions caused a remarkable cytotoxic effect, while the addition of GSH prevented SDF-induced damage at 6-hour exposure time in the higher dilution of SDF. Dentin treated with plain SDF or GSH-incorporated SDF solution showed deposit formation with occluded dentinal tubules, unlike the other groups. Conclusion: SDF severely disturbed the viability, mineralization-ability, and morphology of pulpal-like cells, while controlled concentrations of GSH had a short-term protective effect against SDF-induced damage. GSH showed an inhibitory effect on SDF-induced dentinal deposit formation. Further research is warranted to evaluate the effect of GSH on caries-arresting, anti-hypersensitivity, and antibacterial functions of SDF.

Keywords: Cytotoxicity. Glutathione. Pulp cells. Silver diamine fluoride.

Investigating the vascularisation capacity of a decellularised dental pulp matrix seeded with human dental pulp stem cells: in vitro and preliminary in vivo evaluations.

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International Endodontic Journal, online published on 11 Mar 2021, ahead to print.

Aim: To investigate the vascularisation capacity of a decellularised dental pulp matrix (DDP) of bovine origin seeded with human dental pulp stem cells (hDPSCs) in vitro and to present preliminary in vivo findings.

Methodology: Bovine dental pulps were decellularised and then analysed using histological staining and DNA quantification. The resultant DDPs were characterised using immunohistochemical staining for the retention of vascular endothelial growth factor A (VEGF-A) and fibroblast growth factor 2 (FGF-2). Furthermore, DDPs were recellularised with hDPSCs and analysed histologically. The expression of markers involved in angiogenesis by hDPSCs colonising the DDPs was assessed in vitro. A preliminary in vivo study was then conducted in which hDPSCs-seeded and unseeded DDPs were inserted in debrided human premolars root slices and implanted subcutaneously in immunodeficient mice. Samples were retrieved after 30 days and analysed using histological and immunohistochemical staining. The independent samples t-test, analysis of variance and a Kruskal-Wallis test were used to analyse the quantitative data statistically depending on the group numbers and normality of data distribution. The difference between the groups was considered significant when P-value was less than 0.05.

Results: Acellular dental pulp matrices were generated following bovine dental pulp decellularisation. Evaluation of the developed DDPs revealed a significant DNA reduction ($P < 0.0001$) with preservation of the native histoarchitecture and vasculature and retention of VEGF-A and FGF-2. Upon recellularisation of the DDPs with hDPSCs, the in vitro analyses revealed cell engraftment with progressive repopulation of DDPs' matrices and vasculature, and with enhanced expression of markers involved in angiogenesis. In vivo implantation of root slices with hDPSCs-seeded DDPs revealed apparent vascularisation enhancement as compared to unseeded the DDPs group ($P < 0.0001$).

Conclusions: The developed decellularised dental pulp matrix has pro-angiogenic properties and characterised by the retention of native vasculature and angiogenic growth factors. Seeding of hDPSCs into the DDP led to progressive repopulation of the vasculature, enhanced expression of markers involved in angiogenesis in hDPSCs and improved in vivo vascularisation capacity. The findings of this study suggest that a combination of DDP and hDPSCs might provide a promising vascularisation promoting strategy for dental pulp regeneration.

Keywords: Angiogenesis; Decellularisation; Dental pulp; Dental pulp regeneration; Tissue engineering; Vascularisation.

Debris Extrusion Using Reciproc Blue and XP Endo Shaper Systems in Root Canal Retreatment.

Taher AlOmari, Ruba Mustafa, Rami Al-Fodeh, Hamza El-Farraj, Waheed Khaled, ***Ahmed Jamleh***.

International Journal of Dentistry. 2021 Mar; 2021:6697587.

Abstract: This study aimed at assessing the performance of Reciproc Blue (RB) and XP Endo Shaper (XPS), used for canal retreatment on extracted teeth, in terms of debris extrusion and obturating materials removal. Thirty mandibular premolars were prepared to ProTaper X2 file, obturated using warm vertical compaction, and then incubated for 28 days at 100% humidity at 37°C. Teeth were randomly assigned into two groups, according to the system used for retreatment (RB and XPS). During retreatment, debris extruded beyond the apex was collected in preweighed Eppendorf tubes, and the retreatment time was measured. Afterward, the teeth were longitudinally sectioned to assess the remaining obturating materials. Data were statistically analyzed using the Mann–Whitney test and chi-square test at a 95% confidence level. All the samples had extruded debris at varying weights ranging from 0.125 mg to 3.680 mg. XPS extruded less debris than RB, but no difference was detected (Mann–Whitney test; $P>0.05$). RB and XPS required 54.9 ± 17.9 and 22.3 ± 9.3 seconds to perform retreatment procedures, respectively (Mann–

Whitney test; P>0.05). The sealer was found in all the samples. Compared to the RB group, fewer samples with remaining gutta-percha were found in the XPS group (Chi-square test; P>0.05). None of the files fractured during the retreatment procedure. The tested files appear to extrude debris beyond the apex. Although XPS was able to remove the gutta-percha completely from the majority of the canals, it was unable to remove the sealer.

The Buffalo study: outcome and associated predictors in endodontic microsurgery: a cohort study

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International Endodontic Journal, 2021 Mar;54(3):301-318.

Aim: To (i) evaluate and compare the outcome of endodontic microsurgery (EMS) using periapical radiographs (PAs) and cone-beam computed tomography (CBCT) scans; (ii) identify prognostic factors affecting the outcome; and (iii) correlate the effect of guided tissue regeneration (GTR) on the pattern of apical bone remodelling.

Methodology: Eighty-two patients (101 teeth) who received EMS were included and followed-up using clinical and radiographic examinations (PAs and CBCT scans). Two calibrated endodontists evaluated the radiographic healing (favourable or unfavourable) by assessing PAs and CBCT. The success (favourable radiographic outcome with no clinical symptoms) and survival rates (tooth retention without clinical symptoms) were calculated, and the cause of failure (diseased or fractured) was identified. Pre-treatment (age, sex, tooth type, position, sequence of treatment, quality of root canal before surgery, presence/absence of through-and-through lesion, presence/absence apico-marginal defect) and treatment (presence/absence of errors during surgery, type of error (major or minor), retro-preparation depth, presence/absence of an isthmus, retro-filling material used, presence/absence bone graft material and/or resorbable membrane) factors were recorded. Data were analysed statistically to determine the inter-observer, intra-observer and inter-radiographic agreements. Univariate, bivariate and logistic regression analysis were used to determine prognostic factors affecting the outcome and the effect of GTR on the pattern of apical bone remodelling. The significance level was set at 5%.

Results: Sixty-eight patients (83 teeth) presented for outcome evaluation (recall rate: 84%). The survival rate was 93%. The success rate was 88% using PA and 86% using CBCT when vertical root fracture (VRF) cases were included and 94% using PAs, and 91% using CBCT when VRF cases were excluded. The intra- and inter-observer agreements were substantial using CBCT, slight to a fair agreement using PA ($P < 0.001$), and slight to moderate for inter-radiographic agreement. The occurence of a major procedural error during surgery was the only negative predictor for the outcome of EMS ($P = 0.013$). GTR did not affect the success rate or the type of healing when assessed using PA but it affected the type of healing on CBCT scans (complete vs incomplete healing) and the pattern of cortical plate remodelling ($P < 0.001$). **Conclusion:** The success and survival rate of endodontic microsurgery was very high, and the occurrence of a major procedural error during surgery was the only factor affecting the outcome. GTR did not improve the outcome, but did affect the quality of apical bone remodelling following EMS. **Keywords**: cone-beam computed tomography, endodontic microsurgery, outcome predictors, scoring system

Influence of additional apical enlargement on microcrack formation in root dentine: a micro-computed tomography investigation

Ahmed Jamleh, Mohammad Nassar, ***Abdulmohsin Alfadley, Sulthan Khan, Khalid Alfouzan,*** Carlos Adorno

Clinical Oral Investigations, 2021 Jun; 25(6): 4137-4143.

Objectives: To assess the effect of additional apical enlargement using nickel titanium (NiTi) instruments on the incidence of microcracks using micro-computed tomographic analysis.

Materials and methods: Fifty-one premolars with single canals were enlarged to ProTaper Gold (PTG) F2 (25/08) (Dentsply Sirona), ProFile Vortex Blue (VB) 25/06 (Dentsply Tulsa), or WaveOne Gold (WOG) primary (25/07) (Dentsply Sirona) NiTi rotary instruments (n = 17 each). Afterward, additional apical enlargement was performed in each group with its corresponding larger instrument (F3 (30/09), VB 30/06, or WOG Medium (35/06) instruments, respectively). All teeth were imaged with micro-computed tomography before canal enlargement and after initial and additional apical enlargements to detect new microcracks at the apical 5 mm. An Aligned Rank Transform ANOVA was conducted to examine the effects of file type and canal enlargement on the number of new microcracks resulting from enlargement. A Kruskal-Wallis test was run to compare the file types at each canal enlargement stage.

Results: A significant main effect (P = 0.026) of canal enlargement on the number of new microcracks was found; the number of apical microcracks found after additional enlargement was significantly greater than baseline (P = 0.021); no significant difference was found between baseline and initial enlargement (P = 0.506) and between initial enlargement and additional enlargement (P = 0.252). The Kruskal-Wallis tests found no difference between file types at baseline (P = 0.348), after initial enlargement (P = 0.369) or additional enlargement (P = 0.133).

Conclusions: Regardless of the instrumentation system used, additional apical enlargement led to the formation of high number of new microcracks.

Clinical significance: The results indicated that additional enlargement induced significant number of apical microcracks.

Keywords: Additional apical enlargement; Micro-computed tomography; Microcrack.

Evidence for Reduced Torsional Resistance of Rotary Files under Curved Position

Ahmed Jamleh, Reghad Almedlej, Rasha Alomar, Nouf Almayouf, Abdulmohsen Alfadley, Khalid Alfouzan

The Saudi Dental Journal. Online published 6 Aug 2020, ahead to print.

Objectives: The aim of this in vitro study was to investigate the torsional fatigue resistance of different rotary files in straight and curved positions at a simulated intracanal temperature.

Methods: Forty-eight size #25 files from ProTaper Universal (PTU), ProTaper Next (PTN) and ProTaper Gold (PTG) were tested for torsional resistance in both straight and curved (90 degrees) positions (n = 8 each). The experiment was conducted at a simulated intracanal temperature of 35 ± 1 °C. The torque gauge was reset before every use, and uniform torsional stress was applied by rotating the file clockwise at a speed of 40 rpm until fracture. Torque failure values were recorded, and fractured surfaces were tested using a scanning electron microscopy (SEM). Statistical analysis of the data was completed using one-way ANOVA and post-hoc test (LSD) in order to compare between the tested systems in each file position. Student's t-test was also performed to compare between the two positions in each rotary system, and significance level was set at 5%.

Results: In the straight position, torsional resistance of PTN was significantly lower than that of PTU and PTG ($p < 0.001$), while the PTU and PTG had comparable results ($p > 0.05$). In the curved position, torsional resistance was found to be comparable among all systems ($p > 0.05$). Within each system, the curved position resulted in a significantly lower torsional resistance when compared to the straight position

($p < 0.001$). SEM examination revealed similar torsional failure behavior for all files tested under both positions.

Conclusions: Our study identified that placing files in a curved position was associated with a significant decrease in torsional resistance of all systems, and this necessitates reconsidering the torque settings proposed by the manufacturers. Whether these effects can be translated into in vivo studies remains to be investigated, and thus future studies are essential to provide confirming evidence.

Keywords: Curved position, Torsional resistance, ProTaper Gold, ProTaper Next, ProTaper Universal

The Radix Entomolaris and Paramolaris: A Review and Case Reports with Clinical Implications

Swapna Munaga, Rajkiran Chitumalla, Sheeba Khan, Kiran Halkai, Rizwan Qureshi, Rahul Halkai.

International Journal of Scientific Study, 2020 Jul; 8(4):1-4.

Abstract: Normally, the permanent mandibular first molar has two roots, mesial and distal. However, mandibular molars may have an additional root located either buccally (radix paramolaris) or lingually (radix entomolaris [RE]). Understanding of the presence of an additional root and its root canal, anatomy is essential for successful treatment outcome. The aim of this paper is to review the prevalence and morphology of RE and to present two cases of permanent mandibular first molars with an additional third root (RE) in the Indian population. In this study, we did a clinical investigation of two cases; one case of successful endodontic management of permanent mandibular first molar characterized as RE, whereas the second one is a presentation of a case of severe bone loss around permanent first molar with an additional third root. The presence of an additional third root in permanent mandibular first molars may affect the prognosis of the tooth if it is misdiagnosed. Thus, an accurate diagnosis and thorough understanding of variation in root canal anatomy are essential for treatment success.

Key words: Additional third root, Permanent mandibular first molar, Radix entomolaris, Root canal anatomy

The Hormetic Effect of Arsenic Trioxide on Rat Pulpal Cells: An In Vitro Preliminary Study

Mohannad Nassar, Ahmad Dargham, ***Ahmed Jamleh***, Yukihiko Tamura, Noriko Hiraishi, Junji Tagami

European Journal of Dentistry. Online published 30 Oct 2020, ahead to print.

Objectives: Despite the agreement that there is no longer any indication for arsenic use in modern endodontics, some concerns are surfacing about the minute amount of arsenic trioxide (As_2O_3) released from Portland cement-based materials. The present study investigated the effect of different concentrations of As_2O_3 on rat pulpal cells and the efficacy of *N*-acetylcysteine (NAC) in preventing As_2O_3-mediated toxicity.

Materials and methods: Cytotoxicities of 50, 10, or 5 µm As_2O_3 and the effect of cells co-treatment with 50 µm As_2O_3 and 5,000 µm NAC or 500 µm NAC were tested at 24 hours or 3 days. Cell viability was assessed by means of MTT (3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide) assay and cellular morphological changes were observed under phase contrast microscope.

Statistical analysis: Two-way analysis of variance with Tukey's post-hoc test was used to evaluate differences between the groups (α = 0.05).

Results: At both exposure times, 50 µm As_2O_3 resulted in lower optical density (OD) values when compared with 10 or 5 µm As_2O_3. At 24 hours, 10 µm As_2O_3 resulted in a higher OD value compared with the control; however, at 3 days the difference was statistically insignificant. At each exposure time, the OD value of 5 µm As_2O_3 group was comparable to the control and 10 µm As_2O_3 group. There were no significant differences between 50 µm As_2O_3 group and 500 NAC+50 µm As_2O_3 group; however, these two groups had lower OD values when compared with 5,000 NAC + 50 µm As_2O_3 group at 24 hours and 3 days. The latter group showed significantly lower OD value in comparison with the control at 24 hours and 3 days. Control cells were polygonal-shaped while 50 µm As_2O_3-treated cells exhibited contracted and spherical morphology with increased intercellular spaces. At 24 hours, 10 µm and 5 µm As_2O_3-treated cells were slightly hypertrophic. Cells co-treated with NAC and As_2O_3 showed increased intercellular spaces and lower cellular density compared with the control.

Conclusions: As_2O_3 displayed a hormetic effect on pulpal cells; however, the proliferative effect induced by low As_2O_3 concentrations should be interpreted with caution. NAC did not prevent As_2O_3-mediated toxicity; however, it demonstrated potential for ameliorating this toxicity.

Keywords: arsenic, heavy metal, hormesis, *N*-acetylcysteine, pulp cells, toxicity

Shaping Ability of XP Endo Shaper File in Curved Root Canal Models

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International Journal of Dentistry, 2020 Feb; 4687045:1-6.

Abstract: The aim of this study was to assess the shaping ability of the XP Shaper (XPS) file in severely curved canal models under simulated body temperature and compare it with that of the WaveOne Gold (WOG) file. Ninety-six simulated root canals were equally distributed into XPS and WOG systems to be shaped by eight files each. Files were assessed under a stereomicroscope prior to canal shaping to detect deformation if any. The canals were shaped at 35 ± 1°C using the X-Smart Plus motor. Images of the canals were obtained before and after instrumentation using a stereomicroscope to measure the amount of removed resin from both the inner and outer curvature sides at apex (0 mm) and 3 mm and 6 mm from the apex. The shaping time was calculated. The data were statistically analyzed by the independent *t*-test at 5% significance level. The XPS and WOG systems shaped the canals in 37.0 ± 9.5 and 62.6 ± 11.3 seconds ($P < 0.05$), respectively. At the apex level, the amount of resin removal in both sides did not show a significant difference between the tested groups ($P > 0.05$). At 3 mm and 6 mm levels, the WOG removed more resin than XPS at both sides ($P < 0.05$). 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. In short, XPS and WOG files can be used in shaping severely curved canals as they showed the ability to maintain the original shape with minimal transportation. Both file systems showed signs of deformation after use with a lower number of deformed files observed in WOG throughout the experiment.

Regenerative Endodontic Management of an Immature Molar Using Calcium Hydroxide and Triple Antibiotic Paste: a Two-Year Follow-Up

Mohannad Alasqah, Sulthan Ibrahim Raja Khan, Khalid Alfouzan, Ahmed Jamleh

Case Reports in Dentistry, 2020; 9025847:1-5.

Abstract: The regenerative endodontic procedure (REP) is considered a viable treatment option for immature teeth with necrotic pulp and periapical radiolucency which can facilitate continued root formation. In this report, an immature necrotic mandibular molar received REP in three appointments wherein chemomechanical debridement was performed with a sequential application of nonsetting calcium hydroxide (in the whole canal) and triple antibiotics paste (in the root's middle third) dressings in the first and second appointments, respectively. In the third appointment, blood clots were created in the root canals. MTA was placed over the blood clots and the tooth was restored with a composite filling and stainless-steel crown. Recall appointments were performed for two years where the tooth was deemed asymptomatic clinically and a complete root formation with significant periapical healing was evident radiographically. More cases are required to warrant the feasibility of this disinfection protocol.

Comparison of cyclic fatigue resistance of three NiTi glide path files with different cross-sectional geometric characteristics: An in vitro experimental study

Abdulmohsen Alfadley.

Journal of International Oral Health, 2020 Apr;12(2):158-162.

Aim: New nickel-titanium file systems with improved fatigue resistance are being introduced to the market. This study aimed to compare the cyclic fatigue resistance (CFR) of G1 (#12) file of G file system (Micro Mega, Besançon, France), ProGlider (Dentsply Maillefer, Ballaigues, Switzerland) single-file rotary pathfinding system, and the #13 file of the Flex Glide system (Neoendo, Gurugram, India).

Materials and Methods: Each group had a sample size of 10 files. The cyclic fatigue test was conducted in an artificial stainless steel canal in a customized device. The artificial canal contained an inner diameter of 1.5 mm with 60° angle of curvature and 5 mm radius of curvature. The file tip was positioned at 18 mm with a stopper and then rotation began, synchronized with timing by a digital stopwatch (Timex, Middlebury, CT) to the thousandth of a second. The center of the curvature was located at 7 mm from the tip of the device. For each instrument, time to fracture and the number cycles to fracture (NCF) were recorded. The data were analyzed statistically.

Results: ProGlider files had a significantly higher resistance to cyclic fatigue than G1 files, which in turn had significantly higher CFR than Flex Glide instruments ($P < 0.05$). The lengths of the fractured segment of ProGlider files and G1 files were significantly higher than the Flex Glide files.

Conclusion: Thus, it can be inferred that the ProGlider files had the highest resistance to cyclic fatigue and can be advocated for glide path preparations in severely curved canals.

Keywords: Cyclic Fatigue Resistance, Flex Glide System, G File System, ProGlider

Microcomputed Tomography Assessment of Microcracks following Temporary Filling Placement

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Clinical Oral Investigations, 2020 Apr;24(4):1387-1393.

Objectives: The aim of this study was to detect microcracks and cuspal deflection in tooth crown following the application of temporary filling using microcomputed tomography (micro-CT).

Materials and methods: A mesio-occluso-distal cavity preparation was performed, followed by endodontic access cavity preparation and root canal shaping. Cavities were classified into two groups

according to the type of temporary filling material used; Coltosol F (Coltene Whaledent) (Group I) and intermediate restorative material (IRM; Dentsply Sirona) (Group II). Micro-CT images before and after temporary filling material placement were obtained and then compared for the presence of microcracks. Microcracks considered in our data analysis were the new ones that were detected after temporary filling material placement. The mean number of new microcracks per tooth recorded for both groups were compared using Mann-Whitney U test. The number of teeth with new microcracks in both groups was compared by chi-square test. Repeated measures t test was conducted to observe the effect of temporary filling on the intercuspal distance (ICD). Also, the mean difference in the ICDs detected after temporary filling placement in both groups were compared by independent t test. The significance level was set at 5%.

Results: Eleven microcracks were detected in group I, whereas only three microcracks were observed in group II ($p < 0.01$). The mean numbers of new microcracks were 0.84 and 0.21 in group I and II, respectively ($p < 0.01$). There was no significant difference in the ICDs in group I (0.006±0.02 mm) and group II (0.018 ± 0.03 mm) ($p > 0.26$). Most of the microcracks were found in the dentin structure. The cavity's box area was more affected by new microcracks, compared with the cavity's coronal area. The new microcracks were mainly observed in the mesiodistal direction. No complete fractures were reported in our study.

Conclusions: Both temporary fillings induced microcracks; Coltosol F can induce more microcracks than IRM in premolar teeth after 1-week storage. Most of the microcracks were observed in the dentin structure of the cavity's box area running mesiodistally.

Clinical relevance: The results indicated that the tested temporary fillings developed microcracks on the tooth crown with slight deflection of the cusps.

Keywords: Coltosol F; IRM; Intercuspal distance; Micro-CT; Microcrack; Temporary filling.

Perceived effectiveness about endodontic practice among private general dental practitioners in Riyadh city, Saudi Arabia

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Journal of Family Medicine and Primary Care, 2020 May; 9(5):2426-2430.

Background: Application of newer techniques in endodontics improves the prognosis and reduces the time to operate patients; hence, the present study was conducted to determine the characteristics of endodontic practice and to compare these characteristics between General Dental Practitioners (GDPs) and endodontists with regards to their years of experience in Riyadh city, Saudi Arabia.

Materials and method: A cross-sectional study was conducted among GDPs and endodontists working in private sector in Riyadh. Study subjects were chosen from 5 areas of Riyadh by stratified random sampling. A structured, pretested, closed-ended, and self-administered questionnaire consisting of 36 items was employed. Questionnaire identified different aspects of endodontic practice among participants. Information related to their behavior and perceived effectiveness, and demographic data were also collected.

Results and discussion: A total of 259 practitioners participated in the present study. The mean behavior and perceived effectiveness scores were 5.73 (71.63%) and 1.16 (58%), respectively. A total of 64 respondents (24.7%) used magnification, while 167 (64.5%) employed digital radiography/cone-beam computed tomography. Rotary instruments were employed by 170 participants (65.64%) and adjunctive activator during irrigation was utilized by 50 (19.30%) of respondents. A majority of 217 respondents

(83.80%) reported that they need further training. Correlation analysis revealed that gender was significantly associated with perceived effectiveness (r = 0.136, P = 0.029).

Conclusions: Behavior and perceived effectiveness of practitioners is far from satisfactory and a majority of practitioners identified the need for further training. There was a statistically significant correlation between gender and perceived effectiveness.

Keywords: Endodontic practice; general dental practitioners; perceived effectiveness.

Analysis of Force and Torque with XP Shaper and OneCurve Systems During Shaping of Narrow Canals

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European Endodontic Journal, 2020 May;5(2):123-127.

Objective: The purpose of this laboratory-based study was to compare the shaping forces and torques developed by the XP Shaper (FKG Dentaire SA, La Chaux-de-fonds, Switzerland) and OneCurve (Micro-Mega, Besancon, France) systems during shaping of narrow canals.

Methods: Mandibular premolars with a single canal were divided equally into two groups; XP Shaper and OneCurve (n=16 each). In both groups, the canals were shaped with XP Shaper file (30/01) or OneCurve file (25/O6) that was inserted three times until it reached the canal length. The tooth was surrounded by water under controlled simulated intracanal temperature throughout the experiment. The inward and outward peak forces and the peak torques were recorded and analyzed statistically using the Mann-Whitney test. The shaping times were analyzed using Student's t-test. The significance level was set at 5%.

Results: In both groups, the developed forces in both directions and the torques increased with the successive insertions of the file. In the two groups, the inward peak forces ranged from 0.33 to 3.12 N, while the outward peak forces ranged from 0.09 to 1.96 N. In the three insertions, the XP Shaper showed significantly lower peak forces in both directions. The peak torque developed in both groups ranged from 0.12 to 1.52 N.cm. XP Shaper had significantly lower torque values in all the insertions than OneCurve. The XP Shaper system was able to completely shape the canals in 33.4 seconds while the OneCurve system was able to completely shape the canals in 32.8 seconds.

Conclusion: The XP Shaper system showed favorably lower force and torque values during canal shaping compared with the OneCurve system.

Keywords: Canal shaping, force, OneCurve, torque, XP Shaper

A Rare Case of Single-Rooted Mandibular Second Molar with Single Canal

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Case Reports in Dentistry, 2020 Jun;2020:8096539.

Abstract: The root canal anatomy of mandibular second molar teeth is known to be highly variable. Whilst the most frequently seen configuration is two mesial canals and one distal canal, other variations such as four canals, two canals, and C-shaped canal system do also exist. This case report describes the diagnosis and management of unusual root canal configuration of a mandibular second molar, with one canal in a single conical root, using the contemporary advancements in endodontics. Following clinical and

radiographic examinations of the case, a diagnosis of symptomatic irreversible pulpitis with symptomatic apical periodontitis of tooth #47 was established, and root canal treatment followed by composite buildup and crown were planned. Clinicians should be aware of the different anatomic variants each tooth may exhibit. Furthermore, clinicians need to possess the proper knowledge and skills that allow them to utilize the diagnostic and therapeutic tools available at their disposal in order to optimize the quality of care provided to their patients.

Incidence of postoperative pain after canal shaping by using Reciproc and Twisted File Adaptive systems: a prospective, randomized clinical trial

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Clinical Oral Investigations, 2020 Jul;24(7):2445-2450.

Objectives: The aim of this prospective clinical trial was to investigate the incidence of postoperative pain after initial root canal treatment using Twisted File Adaptive (TFA) and Reciproc systems.

Materials and methods: A total of sixty-four previously initiated or necrotic posterior teeth were randomly assigned to two groups based on the rotary system used; TFA (SybronEndo, Orange, Ca) (n = 35) and Reciproc (VDW, Munich, Germany) (n = 29). All teeth were treated in a single visit. Patients were contacted to assess the level of postoperative pain on a visual analog scale after treatment by 6 h, 24 h, 48 h, 72 h, and 1 week. Patients were also asked to report if any medication was taken during the follow-up period. The postoperative pain scores were analyzed by Mann-Whitney test with respect to follow-up interval at a significance level of 0.05.

Results: Patients treated with TFA reported significantly lower postoperative pain levels at 24 h, 48 h, and 72 h compared with those in Reciproc group ($p < 0.01$). There were no significant differences between the two groups at 6 h and 1-week follow-up intervals ($p > 0.05$). About 11% (TFA) and 24% (Reciproc) of the treated patients took analgesics, but none of them took antibiotics during the follow-up period.

Conclusions: The tested rotary systems induced postoperative pain after root canal treatment. The TFA system was found to induce less pain scores compared with the Reciproc system after the treatment by 24 h, 48 h, and 72 h.

Clinical relevance: The level of postoperative pain was low after the root canal treatment with the Twisted File Adaptive system compared with the Reciproc system.

Keywords: Postoperative pain; Randomized clinical trial; Reciproc; Twisted File Adaptive.

Dentin Conditioning Protocol for Regenerative Endodontic Procedures

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Journal of Endodontics, 2020 Aug;46(8):1099-1104.

Introduction: This study focused on the optimization of sodium hypochlorite-EDTA irrigation in terms of the viability and morphology of dental pulp stem cells (DPSCs) and the effects of an optimized EDTA protocol alone or prepared with nanobubble (NB) water on cell behavior.

Methods: In the first part, human dentin discs were conditioned with the following protocols: (1) Sodium hypochlorite followed by phosphate-buffered saline (PBS), (2) Irrigation protocol from group 1 followed by EDTA, (3) Irrigation protocol from group 2 followed by PBS, (4) Sodium hypochlorite followed by EDTA, (5) Irrigation protocol from group 4 followed by PBS. DPSC viability and morphology were determined. In the second part, dentin discs were conditioned with the (1) optimized protocol in the first part, (2) EDTA prepared using NB water, (3) ultrasonic-activated EDTA, or (4) ultrasonic-activated EDTA prepared using NB water. Transforming growth factor beta release and DPSC viability, morphology, and migration were determined using the enzyme-linked immunosorbent assay, the water-soluble tetrazolium salt-1 cell viability assay and live-dead assay, and the transwell migration assay, respectively. Data were analyzed using Kruskal-Wallis or one-way analysis of variance and post hoc tests.

Results: The highest cell viability was observed in group 3 followed by group 5 ($P < .05$) in which PBS was used as a final rinse. Irrigation protocol from group 3 was used for the subsequent experiments. Ultrasonic-activated EDTA improved transforming growth factor beta release, viability, and migration of the cells compared with EDTA ($P < .05$). The preparation of EDTA with NBs did not change the biological properties of the EDTA-conditioned dentin ($P > .05$).

Conclusions: Removing the residual EDTA using PBS improved the cell viability on the dentin surface. Ultrasonic activation enhanced the growth factor release and biological properties, whereas the preparation of EDTA with NBs showed a similar effect to regular EDTA without compromising the cellular effect.

Keywords: Dentin pulp stem cells; EDTA; growth factor release; nanobubbles; regenerative endodontics; ultrasonic activation.

The use of rotary nickel–titanium endodontic instruments by Dental practitioner in Saudi Arabia-a cross sectional study

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Medical Science, 2020 Sep;24(105):3017-3023.

The objective of the study was to determine the use of rotary nickel-titanium endodontic instruments by Dental practitioners in Saudi Arabia. A cross-sectional study conducted 650 dental practitioners. The result of the study revealed that a total of 180 (60%) of the respondents used rotary endodontic systems, while 90 (40%) did not. The male respondents (66.7%) were more likely to use rotary endodontics than females (55.3%).

Aim: To evaluate the use of rotary nickel–titanium endodontic instruments by Dentalpractitioner in Saudi Arabia.

Material and Method: A questionnaire contains 12 multiple-choice questions conducted online by SurveyMonkey.com. the target samples are undergrad students, dental interns, general practitioners, post grad and Endodontists. The study was done in central, northern, eastern, western and southern regions of Saudi Arabia. The survey was distributed in multiple universities, governmental hospitals, private clinics and social media.

Result: A total of 180 (60%) of the respondents used rotary endodontic systems while 90 (40%) did not. The male respondents (66.7%) were more likely to use rotary endodontics than females (55.3%).

Conclusion: The majority of dentist at Saudi Arabia use rotary NiTi systems for endodontic procedures in their clinical practice.

Keywords: Rotary, nickel–titanium, endodontic, Saudi Arabia

Management of an Endodontically Treated 2-Rooted Mandibular First Molar with 3 Distal Canals. A Case Report

Hajar Albanyan

International Journal of Medical Dentistry, 2020 Sep; 24(3):398-402.

Abstract: This case report describes the endodontic re-treatment management of a two-rooted mandibular first molar with five canals (two mesial and three distal canals). The author also demonstrates the importance of using cone beam computed tomography (CBCT) for diagnosis and treatment planning.

Keywords: five orifices, first mandibular molar, cone beam computed tomography

Fungal Derived Biosynthesised Silver Nanoparticles: a New Approach for Root Canal Disinfection- a Review

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Letters in Applied NanoBioScience, 2020 Oct-Dec; 9(4):1627-1636.

Abstract: Complex root canal morphology, biofilm mediated endodontic infection, and growing microbial resistance to conventional root canal disinfectants lead to endodontic failures. Hence there is an ongoing search for new antimicrobial agents for root canal disinfection. Several nanoparticles were used for root canal disinfection; however, in recent days, biosynthesized silver nanoparticles (AgNPs) have gained immense interest due to their unique properties. Hence, biosynthesized AgNPs provide a new horizon for root canal disinfection due to effective antimicrobial activity and biocompatibility. This review article focuses on the biosynthesis of AgNPs using fungi and their application as antimicrobial agents in root canal disinfection.

Keywords: Biosynthesis; fungi; biosynthesized silver nanoparticles; antimicrobial agents; root canal disinfection.

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

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International Journal of Medical Research& Health Sciences, 2020; 9(9):49-54.

Aims: This study aimed to investigate the prevalence of instrument separation and its management in Riyadh City.

Methods and Material: 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.

Keywords: Dental practitioners, Dental students, Endodontic mishap, File separation, Root number

Soft and Hard Tissue Remodeling Following Endodontic Microsurgery. A Cohort Study

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Journal of Endodontics, 2020 Dec;46(12):1824-1831.

Introduction: The aim of this study was to investigate the impact of the incision type, with or without a coronally repositioning flap (CRF), on soft tissue healing and crestal bone remodeling after endodontic microsurgery (EMS).

Methods: Clinical pictures and cone-beam computed tomography images from 47 patients (120 teeth) taken before surgery and at the follow-up appointment were included in this study. Clinical pictures were qualitatively evaluated by 2 endodontists for the gingival marginal level (GML) (recession, same position, or coronal root coverage), papillary height (same position/receded), and for presence/absence of scars for each tooth. Cone-beam computed tomography images were used to calculate the changes in the distance between the cementoenamel junction and the crestal bone level (CBL) between the preoperative and follow-up scans. Statistical analyses were performed to determine a correlation between patient-related factors (age, sex, tooth type, position, and presence/ absence of a crown), incision techniques, and changes within the CBL.

Results: Gingival recession was more prevalent in mandibular teeth, molar teeth, and teeth that received intrasulcular or papilla-based incisions (P <.05). Scar formation was affected by the flap design (P <.05). CRF was the only technique resulting in coronal root coverage (P <.05). There were no changes observed in the papillary height between the various flap designs. There was also no statistically significant difference in the crestal bone height between the preoperative and follow-up scan measurements (P >.05).

Conclusions: Soft tissue changes are evident after EMS and can be affected by the flap design selected, as well as the site being treated. Application of CRF can improve the position of GML after EMS. There are insignificant changes within the CBL at the facial aspect of the root after EMS.

Keywords: CBCT; coronally repositioning flap; endodontic microsurgery; incision techniques; soft tissue

Comparative analysis of prevalence of apical periodontitis in smokers and non-smokers using cone-beam computed tomography

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Saudi Dental Journal, 2019 Jan; 31(1):52-57.

Objective: The aim of this study was to compare the prevalence and size of periapical lesions among smokers and non-smokers using cone-beam computed tomography (CBCT).

Materials and methods: Retrievable CBCT datasets for 46 male patients ≥18 years during a consecutive period from 2008 to 2016 were examined. The medical, smoking history and other clinical findings (signs of previous dental trauma; Decayed Missing Filled Teeth (DMFT) scores; the percentage of root filled teeth; and oral hygiene status) were obtained. Periapical status of all included teeth was assessed by CBCT images. Statistical analysis was conducted using *t*-test, Pearson correlation and multiple regression.

Results: The prevalence of apical periodontitis was 13.93% in smokers and 14.26% in non-smokers with no significant difference (p = 0.936). The mean of the average size of lesions between the two groups were almost comparable, 3.50 mm in smokers and 2.89 mm in non-smokers (p = 0.567). Pearson correlation and multiple regression analysis showed that the percentage of lesion present and the average lesion size were not correlated to any independent variable.

Conclusions: While smoking is considered a risk factor for marginal periodontitis, there was no difference between smokers and non-smokers in terms of apical periodontitis.

Keywords: Apical periodontitis; CBCT; Prevalence; Smoking.

Detecting the Second Mesiobuccal Canal in Maxillary Molars in a Saudi Arabian Population: A Micro-CT Study

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Scanning, 2019 Mar; 9568307:1-6.

Abstract: The aim of this study was to determine MB2 canal detectability in maxillary first and second molars obtained from a Saudi population using micro-CT. Maxillary first (n=35) and second (n=30) molars were scanned with micro-CT technology. The number of canals was recorded, and in case of having more than one canal, the level of extracanal detection was analyzed. The presence of extracanal was categorized based on the level they were first detected. Among the maxillary first molars, 28 (80%) and six (17%) teeth had two and three MB canals, respectively. Among the maxillary second molars, 24 (80%) and four (13%) teeth had two and three MB canals, respectively. The MB2 canal was detected at the chamber floor in 70% and 61% of the maxillary first and second molars, respectively. At 1 mm depth, the MB2 canal was found in 15% and 18% of the maxillary first and second molars, respectively. At 2 mm depth, the MB2 canal was found in 3% and 18% of the maxillary first and second molars, respectively. The remaining teeth had the MB2 canal at levels deeper than 2 mm. The MB2 canal was detected in 97% and 93%% of maxillary first and second molars, respectively. Among them, the MB2 canal could be immediately detected in 70% and 61% of the maxillary first and second molars, respectively, once the pulp chamber is exposed. However, the rest of the MB2 were observed at deeper levels in the root and this requires troughing preparation in the chamber floor.

Root Canal Treatment with postcore restoration versus implant restoration: Clinical and radiographic outcome and quality of life after treatment

Abed Al-Hadi Hamasha, Ashraf Fareed Nbhan

Saudi Endodontic Journal, 2019 May; 9(2):88-95.

Introduction: The study intended to support the decision-making process regarding whether to save a compromised tooth by endodontic treatment with a subsequent postcore and crown or to extract such a tooth in favor of implant replacement. Therefore, the aim of this study is to explore differences between the two modalities of treatments in terms of clinical and radiographic outcomes and quality of life.

Materials and Methods: A randomly selected 126 patients with 150 root canal treatment (RCT) teeth compared with 150 single-tooth implants in 129 patients was conducted at Jordan University of Science and Technology in Jordan. Participants were clinically and radiographically examined after 1 year of treatment. Administered questionnaires were filled on patient interview consisting of patient's characteristics and oral health impact profile (OHIP) instrument. Data analysis included descriptive statistics, bivariate analysis using Mann–Whitney tests and Chi-square tests.

Results: Treatment outcomes for RCT and implant groups were as follows, respectively: success (75.3% and 56.7%), satisfactory survival (8.7% and 24.7%), compromised survival (4% and 10%), and failure (12% and 8.7%). Improvement of the subject's OHIP items reveals a notable improvement (67%–100%) following RCT (mean improvement = 96.32) and implant (mean improvement = 89.04) treatment.

Conclusion: RCT and implant achieved equivalent proportion of cases having a good prognosis. However, implant restoration was associated with more postoperative complications. Both treatments achieved a predictable improvement in patient's OHIP.

Keywords: Implant, oral health impact profile, outcome, postcore, root canal treatment

Cyclic Fatigue and Torsional Failure of EdgeTaper Platinum Endodontic Files at Simulated Body Temperature

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Journal of Endodontics, 2019 May;45(5):611-614.

Introduction: The aim of this in vitro study was to compare the cyclic fatigue resistance and torsional resistance of EdgeTaper Platinum (ETP) with those of ProTaper Gold (PTG) at simulated body temperature.

Methods: ETP and PTG files with #25 tip size were selected. Cyclic fatigue tests were performed in a stainless steel artificial canal until file fracture occurred. The time to fracture was recorded. For the torsional resistance testing, the apical 5 mm of the file was firmly secured with acrylic resin, and the assembly was fixed over torque gauge device. A uniform torsional stress was applied with continuous rotation motion until fracture occurred. The torque at failure was recorded. Both experiments were conducted at 35 ± 1°C. Fractured surfaces were tested via scanning electron microscopy. Statistical analysis was performed using independent Student t test at 5% significance level.

Results: The ETP had superior cyclic fatigue resistance than PTG ($P < .01$). However, it exhibited lower torsional resistance ($P < .05$). The ETP and PTG showed typical features of cyclic and torsional fatigue behavior under scanning electron microscopy.

Conclusions: The ETP exhibited superior resistance to cyclic fatigue but failed to show any improvement in the torsional resistance compared with PTG.

Keywords: Cyclic fatigue; EdgeTaper Platinum; ProTaper Gold; torsional resistance.

Torsional resistance of three ProTaper rotary systems

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BMC Oral Health, 2019 Jun;19(1):124.

Background: The aim of this study is to compare the torsional resistance of the available ProTaper rotary systems, namely, ProTaper Universal (PTU), ProTaper Next (PTN), and ProTaper Gold (PTG).

Methods: A total of 195 files from the three systems distributed into 13 groups (PTU-S1, PTU-S2, PTU-F1, PTU-F2, PTU-F3, PTG-S1, PTG-S2, PTG-F1, PTG-F2, PTG-F3, PTN-X1, PTN-X2 and PTN-X3) were subjected to torsional fatigue until failure. The torsional test was performed according to ISO 3630-1, where each file was placed in a straight position to eliminate the influence of cyclic fatigue. The Kruskal–Wallis test was conducted to compare the mean maximum torques and angular deflections at fracture for the groups, and the Mann–Whitney test was performed for pairwise comparisons. The significance level was set at 0.05 and the fractured surfaces were examined under a scanning electron microscope.

Result: Among the tested files, PTG-S1 had the lowest torsional fatigue resistance, whereas PTU-F2 and PTU-F3 had the highest torsional resistance. The scanning electron microscope showed typical features of torsional failure.

Conclusion: The new ProTaper systems (PTG and PTN) did not show improved torsional resistance in comparison with PTU.

Keywords: ProTaper gold, ProTaper next, ProTaper universal, Scanning electron microscope, Torsional resistance

A Case Report of Endodontic Treatment of a Mandibular First Molar with Unusual Length of Root Canal System

Reem Sami Alwakeel

Canadian Journal of Biomedical Research and Technology, 2019 Jul; 2(1):1-3.

Abstract: The main object of performing a root canal treatment is to facilitate the complete debridement from all the bacteria and infections followed by the obturation process in order to achieve periapical healing. In some situation, this process becomes complicated due to the presence of some obstacles, such as abnormal length of the root. In this reported article, the purpose is to show a successful non-surgical root canal treatment of a mandibular first molar with unusual working lengths. The post-treatment radiographs show successful obturation to the optimum length in all canals. This case report highlights the importance of applying knowledge and in the management of abnormal anatomic variation in which it plays an essential role in the success of the endodontic treatment outcome.

Root canal treatment of maxillary first molar with Vertucci Type V diagnosed by cone beam computed tomography

Abdulaziz Alsaeed, ***Ahmed Jamleh***

Saudi Endodontic Journal, 2019 Sep-Dec;9(3):231-234.

Abstract: Cone beam computed tomography (CBCT) imaging can be used as a reliable aid to identify root canal system configurations and guide their treatment. The aim of this case report is to describe the root canal treatment of maxillary first molar with an unusual morphology diagnosed by CBCT. The tooth had a canal that started with a single canal orifice and ended with two apical foramina.

Keywords: Maxillary first molar, single root, Vertucci Type V

The degree of crown discoloration induced by a bioceramic and other conventional endodontic sealers

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Saudi Endodontic Journal, 2019 Sep-Dec;9(3):192-197.

Objective: The aim of this study was to compare the degree of crown discoloration induced by a novel bioceramic and conventional endodontic sealers.

Materials and Methods: Thirty extracted maxillary central incisors were selected and randomly divided into three groups (*n* = 10), according to the assigned sealer: G1 – TotalFill, G2 – Apexit Plus, and G3 – AH Plus. Baseline color of the labial surfaces was obtained using a spectrophotometer. Standardized root canal preparation and obturation were completed using ProTaper system and gutta-percha with sealer cement. Access openings were sealed using light-cured resin composite. Specimens were stored in saline and placed in an incubator at 37°C until testing. Crown color was reassessed after 1 week, 1 month, and 3 months. Color change from baseline was calculated using the following equation: $\Delta E^* = ([\Delta L^*]^2 + [\Delta a^*]^2 + [\Delta b^*]^2)^{½}$. Data were analyzed using ANOVA, *t*-test, and Tukey *post hoc* test (at $P \leq 0.05$).

Result: In the three groups tested, the highest mean value of color change was found after 3 months, whereas the lowest was at 1 week. Changes were significant in all groups ($P < 0.001$ in G1 and G2, $P = 0.009$ in G3). At all assessment times, no significant difference was found between the three groups of sealers tested ($P = 0.593$, $P = 0.185$, and $P = 0.33$ at 1 week, 1 month, and 3 months, respectively). Nevertheless, G1 showed the highest and G3 the lowest color changes at both 1 and 3 months.

Conclusion: It was concluded that all sealers tested result in a measurable and gradual tooth color change. While the bioceramic sealer resulted in a slightly higher color change compared to calcium hydroxide- and resin-based sealers, the difference was not considerable.

Keywords: AH Plus, apexit plus, color change, endodontic sealers, totalfill

In Vivo and In Vitro Diagnosis of Cracked Teeth: A Review

Abdulrahman N. Alsolaihim, ***Aljood A. Alsolaihim,*** Layla O. Alowais

Journal of International Oral Health, 2019 Nov-Dec;11(6):329-333.

Abstract: Dentinal microcracks are a diagnostic challenge, which determines the longevity of the tooth structure. A few etiological factors of dentinal microcracks are traumatic occlusion in aging teeth and also the effect of rotary files, heavy spreader pressure during condensation, and post-placement during root canal treatment. This article describes the various *in vivo* and *in vitro* diagnostic aids and describes in detail various recent methods used for the detection of microcracks *in vitro* with special emphasis on micro-computed tomography (micro-CT). Micro-CT has wide applications in medical imaging. Micro-tomography scanners offer isotropic resolution, and therefore three-dimensional images can be displayed. Also, micro-CT is very precise, has remarkable space resolution, and requires a shorter capture time than cone beam computed tomography.

Keywords: Dentinal microcracks, detection, Micro-CT

Irrigation effectiveness of continuous ultrasonic irrigation system: An ex vivo study

Ahmed Jamleh, Hideaki Suda, Carlos G. Adorno

Dental Materials Journal, 2018 Jan;37(1):1-5.

Abstract: This study evaluated the irrigation extrusion and smear layer (SL) removal of continuous ultrasonic irrigation (CUI). Forty root canals were shaped, embedded in warm sterile saline agar colored with 1% acid red, and distributed into four groups; three groups had the final irrigation sequence of sodium hypochlorite and EDTA solutions performed by using syringe irrigation (SI), EndoVac (EV), and CUI, respectively. Group 4 had the canals ultrasonically irrigated with saline (CUIS). Irrigant extrusion was verified by a color change of the agar. The SL was evaluated under scanning electron microscope. Irrigant extrusion was observed in two and four teeth in the CUI and SI, respectively, whilst none had irrigant extruded in the EV. In term of SL, the CUI was comparable to EV at 1 and 3 mm but different to SI at 1 mm. Although CUI might clean the root canal system effectively, it was unable to avoid irrigant extrusion.

Keywords: Continuous ultrasonic irrigation; EndoVac; Irrigation extrusion; Smear layer.

Fracture of Nickel Titanium Rotary Instrument During Root Canal Treatment and Re-Treatment: A 5-Year Retrospective Study

Khalid Alfouzan, Ahmed Jamleh

International Endodontic Journal, 2018 Feb;51(2):157-163.

Aim: To evaluate retrospectively the incidence of K3 nickel titanium rotary instrument fracture in referred cases during root canal treatment and re-treatment.

Methodology: Clinical and radiographic reports of 12 867 endodontic cases treated at the King Abdulaziz medical city between January 2010 and November 2015 were reviewed to obtain information on intracanal fractured instruments with respect to the treatment performed, tooth type and the size and at what level the instrument fractured (coronal, middle or apical). The degree of canal curvature was classified into mild (<10˚), moderate (10-25˚) or severe (>25˚). Logistic regression was used to test the incidence of instrument fracture in relation to the root canal treatment performed and tooth type. Chi-square tests were used to analyse the fracture incidence in the treated teeth in respect to fracture level and fractured file diameter. The level of significance was set at 0.05.

Results: Root canal treatment was performed on 8946 cases, whilst re-treatment was performed on 3921 cases. The fracture incidence was higher during re-treatment cases (2.96%) than in primary root canal treatment (0.74%) ($P < 0.001$) with a 1.41% incidence overall. There was a trend for more fractures in maxillary (1.68%) and mandibular (1.35%) molar teeth. Moreover, 56.6% of the fractured instruments occurred in severely curved canals, and the apical third of the root canal was the most common site for instrument fracture (85.7%), followed by middle (13.2%), and coronal (1.1%) thirds, mostly with file sizes 20 and 25 (59.9% and 25.27%, respectively).

Conclusion: The fracture incidence of K3 instruments was significantly greater during root canal re-treatment than root canal treatment, mainly with small instruments and in the apical third of the canals.

Keywords: K3 rotary system; canal curvature; instrument fracture; retrospective study; root canal re-treatment; root canal treatment.

The Antifungal Effect of Propolis Endodontic Irrigant with Three Other Irrigation Solutions in Presence and Absence of Smear Layer: An In Vitro Study

Lama Awawdeh, ***Ahmed Jamleh***, Maha Al Beitawi

Iranian Endodontic Journal, 2018 Spring;13(2):234-239.

Introduction: The aim of this *in vitro* study was to compare the antifungal effect of propolis as an endodontic irrigant agent with a mixture of doxycycline, citric acid, and a detergent mixture (MTAD), 2% chlorhexidine (CHX) and 3% sodium hypochlorite (NaOCl) against *Candida albicans* in presence and absence of smear layer.

Methods and Materials: Extracted teeth with single canals (*n*=104) were prepared and randomly distributed into four experimental groups; 30% propolis, MTAD, 2% CHX and 3% NaOCl. Each group had two subgroups; with and without smear layer. The antifungal effectiveness was evaluated. The Kruskal-Wallis and Mann-Whitney tests were used to compare the overall effectiveness of different treatments at significance level of 0.05.

Results: Propolis, CHX and NaOCl had similar levels of effectiveness to each other against *C. albicans*, and these levels were not affected by the presence or absence of the smear layer. Each irrigant was significantly more effective than MTAD or saline solution. MTAD was less effective in the presence of the smear layer than in its absence.

Conclusions: Propolis irrigation can produce root canals that are free of *C. albicans*, even in the presence of the smear layer.

Key Words: Candida albicans, Chlorhexidine, Irrigating Solution, Propolis, Smear Layer, Sodium Hypochlorite

Vertical Force Induced with WaveOne and WaveOne Gold Systems during Canal Shaping

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Journal of Endodontics, 2018 Sep;44(9):1412-1415.

Introduction: The aim of this study was to evaluate the amount of vertical force induced with WaveOne (WO; Dentsply Sirona, York, PA) and WaveOne Gold (WOG, Dentsply Sirona) systems during the canal shaping of extracted teeth.

Methods: Thirty canals in 15 maxillary premolars were divided into 2 groups: WO and WOG. The canals were gently shaped with WO/WOG Primary instruments according to the manufacturer's instructions. The vertical forces induced during canal shaping in the apical and coronal directions were recorded. The apically and coronally directed peak forces were used for analysis using the Mann-Whitney U test. The instrumentation time was analyzed using the Student t test. All statistical analyses were performed using SPSS software (Version 22.0; IBM, Armonk, NY) at a 5% significance level.

Results: The force increased with the successive instrument insertions within each group. The apically and coronally directed peak forces of the WO and WOG groups ranged from 2.89-11.58 N and from 1.53-2.92 N, respectively. In the 3 insertions, WO showed higher peak forces in both directions. For apically directed peak forces, WO had significantly higher peak forces in the first and third insertions than WOG ($P < .01$). For coronally directed peak forces, WO had significantly higher values in the first and second insertions ($P < .05$).

Conclusions: The WOG system had significantly lower apically and coronally directed peak force values compared with the WO system.

Keywords: Vertical load; WaveOne; WaveOne Gold.

Effects of Sodium Hypochlorite Concentration and Temperature on the Cyclic Fatigue Resistance of Heat-treated Nickel-titanium Rotary Instruments

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Journal of Endodontics, 2018 Oct;44(10):1563-1566.

Introduction: We tested the cyclic fatigue resistance of heat-treated instruments immersed in sodium hypochlorite solution under different concentrations and temperature conditions.

Methods: Based on the irrigating solution's concentration and temperature, 135 ProTaper Gold (PTG; Dentsply Sirona, York, PA) F2 instruments were divided equally into 9 groups of 15. Cyclic fatigue testing was performed by using a block with artificial canals with a curvature angle of 60°, a curvature radius of 5 mm, and a curvature center 5 mm from the instrument tip. The block was fixed inside a water bath of distilled water, 2.5% sodium hypochlorite (NaOCl), or 5.25% NaOCl. The temperature was preset at 25°C, 37°C, or 60°C. The instrument was rotated at 300 rpm until fracturing occurred. The number of cycles to fracture was calculated, and the fragment length was measured. Fractured surfaces were examined via scanning electron microscopy. NCF data were analyzed statistically via Kruskal-Wallis and Mann-Whitney tests. All statistical analyses were performed using SPSS software Version 22 (IBM Corp, Armonk, NY) at a 5% significance level.

Results: The number of cycles to fracture of the PTG F2 was highest in distilled water at 25°C and lowest in 5.25% NaOCl at 60°C. Changing the irrigating solution from distilled water to NaOCl and increasing the surrounding temperature reduced the fatigue resistance.

Conclusions: NaOCl irrigating solution at different concentrations and temperatures influenced the cyclic fatigue resistance of PTG instruments. Future NiTi instrument failure studies should be conducted under simulated body temperature conditions in commonly used irrigating solutions.

Keywords: Concentration; ProTaper Gold; cyclic fatigue resistance; heat-treated file; sodium hypochlorite; temperature.

Non-Surgical Root Canal Treatment Case VIII: Mandibular Molar (Book Chapter)

***Ahmed O. Jamleh*,** Nada Ibrahim.

In: Clinical Cases in Endodontics, ed. by Takashi Komabayashi. John Wiley & Sons, Inc. 2018, 105-112.

Summary: This chapter presents a case of the patient (Pt) who was a 9-year-old male. He had normal mental and physical development. His past medical history was unremarkable with no known drug allergies (NKDA). The Pt was considered American Society of Anesthesiologists Physical Status Scale (ASA) Class I. Extra-oral examination (EOE) showed a 1 cm erythematous nodule at the skin overlying the left mandibular body. The nodule had a crusted surface and was tender to touch. The case presented in the

chapter helps dentists to understand the correct questions for obtaining an adequate history of presenting symptoms. It also helps them to form a diagnosis of pulpal and periapical conditions based on complete data from history, examination, and tests. The chapter describes the clinical and radiographic criteria used to determine success of nonsurgical root canal treatment.

Prevalence of apical periodontitis and quality of root canal treatment in an adult Saudi population

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Saudi Medical Journal, 2017 Apr;38(4):413.

Objectives: To determine the health status of periradicular tissue and the quality of root canal fillings in an adult Saudi population attending dental clinics for the first time.

Methods: This cross sectional study was conducted in the dental clinics at King Saud University, Riyadh and other dental centers (Jeddah, Najran, and Albaha City), Kingdom of Saudi Arabia between year 2010 and 2012. Good-quality panoramic radiographs of 926 Saudi subjects (540 males and 386 females) were analyzed based on the gender, age, health status, smoking habits, periapical status of the endodontically treated teeth, technical quality of the root canal fillings, and the presence or absence of coronal restoration. Data were calibrated and statistical analyses were performed using the Statistical Package for the Social Sciences (SPSS Inc., Chicago, IL, USA) version 17.

Results: Of the 25,028 teeth examined, 1,556 teeth (6.2%) had apical periodontitis (AP). Male subjects aged over 55 years and females between 36 and 45 years had higher AP. A total of 36 diabetic and 87 smokers subjects had AP. The AP was more common in male diabetics than female (p=0.383), and in female smokers more than male (p=0.44). Only 42.2% of male and 57.7% of female teeth had adequate root canal treatment.

Conclusions: Apical periodontitis was significantly related to diabetes, smoking, and inadequate endodontic treatment.

Higher maximal occlusal bite force in endodontically treated teeth versus vital contralateral counterparts

Lama Awawdeh, Khalid Hemaidat, Wael Al-Omari

Journal of Endodontics, 2017 Jun;43(6):871-875.

Introduction: Decreased sensitivity to occlusal load could lead to a greater risk of damage to endodontically treated teeth. Therefore, this study aims to test whether root canal treatment reduces the sensitivity of the treated teeth to occlusal load.

Methods: This is a comparative cross-sectional study of 124 patients who received root canal treatment. Treated teeth were compared with vital teeth on the contralateral side. After interviews with participants, their maximal bite forces (MBFs) of their root canal-treated and contralateral untreated teeth were measured using a digital bite fork force transducer. Data were analyzed by comparing the mean MBF of root canal-treated and control teeth.

Results: The mean MBF (± standard deviation) was 226.6 N (±168.7) for root canal-treated teeth and 207.93 N (±158.08) for control teeth. Root canal-treated teeth had a significantly higher difference in the

mean MBF than the control group (P < .0001) using the paired sample t test. A univariate analysis test showed that differences in the MBF were affected by molar relationship, overbite, and the quality of root filling.

Conclusions: The difference in the MBF was significantly higher in root canal-treated teeth, which is consistent with the function of dental pulp as a highly sensitive sensor. Therefore, the reduction in the sensitivity of teeth to an applied load after pulp removal may increase the risk of overloading. This may, in turn, increase the frequency of tooth damage after root canal treatment.

Keywords: Occlusal bite force; root canal–treated teeth.

Attachment and Proliferation of Dental Pulp Stem Cells on Dentine Treated with Different Regenerative Endodontic Protocols

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International Endodontic Journal, 2017 Jul;50(7):667-675.

Aim: To investigate the attachment and proliferation of dental pulp stem cells (DPSC) on dentine treated with various endodontic regeneration protocols.

Methodology: Standardized dentine samples were irrigated with sodium hypochlorite (1.5% NaOCl) and ethylenediaminetetraacetic acid (17% EDTA) and randomized into four treatment groups and two control groups. The treatment groups were treated with a clinically used concentration of triple antibiotic paste (TAP), double antibiotic paste (DAP), calcium hydroxide ($Ca(OH)_2$) or diluted TAP in a methylcellulose system (DTAP) for 1 week. Each sample in the treatment groups was then irrigated with EDTA. The two control groups were treated with EDTA or received no treatment. Dental pulp stem cells were seeded on each dentine specimen (10 000 cells). Lactate dehydrogenase activity assays were then performed to evaluate the attached DPSC after 1 day of incubation. Water-soluble tetrazolium assays were used to determine DPSC proliferation after three additional days of incubation. Friedman's test followed by least significant difference were used for statistical analyses ($\alpha = 0.05$).

Results: Triple antibiotic paste and DTAP regeneration protocols, as well as EDTA-treated dentine, caused significant increases in DPSC attachment to dentine. Triple antibiotic paste, DAP and $Ca(OH)_2$ regeneration protocols caused significant reductions in DPSC proliferation on dentine. However, the DTAP regeneration protocol did not have any significant negative effects on DPSC proliferation.

Conclusions: The clinically used endodontic regeneration protocols that include the use of TAP, DAP or $Ca(OH)_2$ medicament negatively affected DPSC proliferation on dentine. However, the use of DTAP medicament during regenerative endodontic treatment may not adversely affect the proliferation of DPSC.

Keywords: calcium hydroxide; dental pulp stem cells; endodontic regeneration; ethylenediaminetetraacetic acid; triple antibiotic paste.

Successive Spreader Insertion Forces Induced by Undergraduate Students during Canal Obturation

Ahmed Jamleh, Khalid Alfouzan, Lama Awawdeh, Abdulmohsen Alfadley, Nada Ibrahim, Seham Alhijji, Emad Masuadi

Saudi Endodontic Journal, 2017 May - Aug;7(2):110-114.

Introduction: To investigate the forces induced by successive spreader insertions by undergraduate dental students.

Materials and Methods: Thirty-eight artificial resin teeth (Real-T Endo, Acadental, Lenexa, KS, USA) were used. After canal preparation, the teeth were distributed equally into male and female students to perform canal obturation with the lateral compaction technique. A force gauge (M5-20 Advanced Digital Force Gauge; Mark-10 Corporation, NY, USA) was used for recording the spreader insertion force. Linear mixed model was used to assess the effects of both gender and repeated measures of spreader insertion on spreader penetration forces during canal obturation at a significance level of 5%.

Results: The mean maximum forces measured were in the range of 1.13 ± 0.44–1.67 ± 0.64 kg. There was a significant difference between the five insertion times (P = 0.003), and the initial three insertion times were lower than the fourth and fifth times. Although female students apply more force, there was no significant difference when compared to that of male students (P = 0.136).

Conclusion: The force gauge device can be used as educational tool to measure the force applied during canal obturation. Although the forces applied by female students were higher than the male students, they were all considered safe.

Keywords: Canal obturation, lateral compaction, penetration force, undergraduate students

The Impact of Educational Intervention on Dental Anxiety in Patients Undergoing Nonsurgical Endodontic Procedures: A Randomized Experimental Study

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International Journal of Dentistry & Oral Health, 2017 Dec; 3(10),128-133.

Aim: the purpose of this experimental study was to evaluate the impact of preoperative education methods on anxiety levels amongst dental patients; those undergoing endodontic procedures in particular.

Methods: This study consisted of 70 patients who were about to undergo non-surgical endodontic procedures. The 70 patients were randomly distributed to two equal groups; intervention and control. The dental anxiety was measured for all patients prior to the experiment using the Modified Dental Anxiety Scale (MDAS). After that, the intervention group received an audiovisual tool explaining the RCT procedure in detail, while patients in the control group were handed a brief written description of the procedure similar to what is offered in standard practice. The dental anxiety was measured afterwards using the same scale (MDAS).

Results: Overall, a decrease in the level of anxiety was noticed in both groups. However, the difference between the pre and post anxiety score means was much more significant in the intervention group.

Conclusion: The results of this experimental study prove that proper education prior to a feared dental procedure can decrease the level of anxiety amongst patients; thus highlighting the need for better patient education in the dental setting.

A Comparison between Two Negative Pressure Irrigation Techniques in Simulated Immature Tooth: An Ex Vivo Study

Ahmed Jamleh, Yasue Fukumoto, Yoshioka Takatomo, Chihiro Kobayashi, Hideaki Suda, Carlos G. Adorno

Clinical Oral Investigations, 2016 Jan;20(1):125-131.

Objectives: This ex vivo study evaluated the irrigation efficacy of a new apical negative pressure system (ANP) in canals with simulated immature teeth, by comparing it to EndoVac (EV) system in terms of smear layer (SL) removal and irrigation extrusion.

Materials and methods: Three millimetres of the root end of 40 single canalled lower incisors were resected and decoronated to standardize root canal length. After instrumentation, the specimens were embedded in warm normal saline agar coloured with 1 % acid red and randomly divided into four groups; one control group and three experimental groups. Except in the control group where distilled water was used as irrigant using positive pressure irrigation needle, the canals were irrigated with 6 % NaOCl and 17 % EDTA using the intracanal negative pressure needle (iNP) system, the EV system or 27G open-ended needle under positive pressure (PP). NaOCl extrusion was determined by observing a discolouration of the agar surrounding the root. The SL was evaluated by observing scanning electron microscope images based on a four-level scoring system.

Results: Two specimens with irrigant extrusion were observed in the iNP group, which was significantly different (logistic regression, $p < 0.05$) to EV and PP. There were no significant differences (Kruskall-Wallis test, $p > 0.05$) among the experimental groups in terms of SL removal, but all were significantly different to the control group.

Conclusions: Irrigation with the iNP could be a viable alternative to EV as an apical negative pressure irrigation technique especially while treating immature teeth.

Clinical relevance: ANP in canal cleanliness is recommended to be utilized in treating immature teeth where periapical tissues should be saved and stimulated. The iNP system might have the potential to avoid irrigant extrusion while cleaning the canal till the apical end.

Keywords: Apical negative pressure; EndoVac; Intracanal negative pressure; Irrigation extrusion; Positive pressure irrigation; Smear layer.

Neurological Complication and Facial Skin Scarring following Inadvertent Extrusion of Sodium Hypochlorite and Calcium Hydroxide during Root Canal Treatment-Report of a Case

Khalid Al Fouzan

Endodontic Practice Today, 2016 Mar;10(1):45-49.

Abstract: The aim of this article was to report the presentation and management of a clinical case with neurological and facial skin complications secondary to the extrusion of sodium hypochlorite and calcium hydroxide into the facial soft tissues during root canal treatment. An adult male patient was referred to the endodontic clinic after inadvertent extrusion of sodium hypochlorite and calcium hydroxide into the periapical tissues during root canal treatment. The severe clinical consequences, with particular emphasis on nerve deficit and soft tissue are discussed and its management is highlighted. Early and aggressive treatment is advocated following such incidents in order to reduce potentially serious complications. This article demonstrates the possible detrimental effect of extrusion of sodium hypochlorite and calcium hydroxide intracanal dressing into the periradicular and adjacent soft tissues.

Key words: calcium hydroxide, irrigation, nerve damage, skin scarring, sodium hypochlorite

Effect of nickel titanium file design on the root surface strain and apical microcracks

Ahmed Jamleh, Carlos G. Adorno, Arata Ebihara, Hideaki Suda

Australian Endodontic Journal, 2016 Apr; 42(1):25-31.

Abstract: The aim of this study was to determine the effect of nickel titanium file design on the root surface strain generated and apical microcracks caused during canal shaping. Thirty-three mandibular incisors were distributed into LightSpeed X, FlexMaster and a control group. A strain gauge was fixed apically on the proximal root surface to determine the maximum strain during canal shaping. Except for the control group, all root canals were enlarged to size 50. Images were taken after removing the apical 1 and 2 mm of the root end. Mean maximum strain values and presence of microcracks were statistically compared using the t-test and chi-square test, respectively. During canal shaping, the strain increased cumulatively with mean maximum strains of 808.2 ± 228.8 and 525.1 ± 168.9 microstrain in LightSpeed X and FlexMaster, respectively (P = 0.004). Both systems caused comparable microcracks. Although LightSpeed X produced higher maximum strain, no difference in microcrack development was found between both systems.

Keywords: FlexMaster; LightSpeed X; microcrack; root surface strain.

Radiographic Diagnosis of Periapical Status and Quality of Root Canal Fillings in a Saudi Arabian Subpopulation

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Oral health & Preventive Dentistry, 2016 May;14(3):241-248.

Purpose: To assess the prevalence of apical periodontitis (AP), as determined by orthopantomograms (OPGs), and its correlation with the quality of root fillings and coronal restorations.

Materials and methods: This cross-sectional study evaluated a random sample of 193 patients--112 (58%) females and 81 (42%) males--who presented as new patients at the Division of Endodontics. Digital OPGs were independently examined by two reliability-calibrated endodontists. The total number of teeth present, the location of the root canalfilled teeth, and the presence or absence of AP were recorded for each radiograph. The results were statistically analysed using the chi-square test followed by model building using multiple logistic regression.

Results: A total of 324 endodontically treated teeth from the 193 selected radiographs were analysed. The mean number of teeth per patient was 25.5 ± 4.6, with an average of 1.64 root canal treatments per subject. Radiographically detected AP was associated with 190 (58.6%) root canal-treated teeth. The logistic model shows that the quality of endodontic treatment (adjusted odds ratio [ORa] = 1.82; 95% confidence interval [CI]: 1.40-3.17), status of coronal restoration (ORa = 1.77; 95% CI: 1.20-2.61) and the type of material used for coronal restorations (ORa = 1.39; 95% CI: 1.03-1.87) were significantly related to the periapical health of the teeth.

Conclusions: The quality of endodontic treatment, status of coronal restoration and the type of coronal restorative material were found to be the most important factors influencing the health of periradicular tissue.

Key words: apical periodontitis, coronal restoration, coronal status, root canal filing

Performance of NiTi endodontic instrument under different temperatures

Ahmed Jamleh, Yoshio Yahata, Arata Ebihara, Amre R. Atmeh, Turki Bakhsh, Hideaki Suda

Odontology, 2016 Sep;104(3):324-328.

Abstract: The purpose of this study was to test nickel titanium (NiTi) instrument performance under different surrounding temperatures. Twenty-four superelastic NiTi instruments with a conical shape comprising a 0.30-mm-diameter tip and 0.06 taper were equally divided into 3 groups according to the temperature employed. Using a specially designed cyclic fatigue testing apparatus, each instrument was deflected to give a curvature 10 mm in radius and a 30° angle. This position was kept as the instrument was immersed in a continuous flow of water under a temperature of 10, 37, or 50 °C for 20 s to calculate the deflecting load (DL). In the same position, the instrument was then allowed to rotate at 300 rpm to fracture, and the working time was converted to the number of cycles to fracture (NCF). The statistical significance was set at p = 0.05. The mean DL (in N) and NCF (in cycles) of the groups at 10, 37, and 50 °C were 10.16 ± 1.36 and 135.50 ± 31.48, 13.50 ± 0.92 and 89.20 ± 16.44, and 14.70 ± 1.21 and 65.50 ± 15.90, respectively. The group at 10 °C had significantly the lowest DL that favorably resulted in the highest NCF. Within the limitations of this study, the surrounding temperature influences the cyclic fatigue resistance and DL of the superelastic NiTi instruments. Lower temperatures are found to favorably decrease the DL and extend the lifetime of the superelastic NiTi instrument. Further NiTi instrument failure studies should be performed under simulated body temperature.

Keywords: Deflecting load; Number of cycles to failure; Superelastic NiTi instrument; Temperature.

Apical Gutta-percha cone adaptation and degree of tug-back sensation after canal preparation

Ahmed Jamleh, Lama Awawdeh, Hajar Albanyan, Emad Masuadi***, Khalid Alfouzan***

Saudi Endodontic Journal, 2016 Sep;6(3):131-135.

Aims: The aim of this study was to investigate the degree of tug-back after canal preparation with respect to the Gutta-percha-occupied area (GPOA).

Materials and Methods: Roots of twenty premolar teeth were prepared till size 35/0.04, then GP cones of same size and taper were adapted to root canals and the degree of tug-back sensation was scored as loose, slight, adequate, and strong. Root canals were filled with GP and AH26 sealer, and then sectioned horizontally 1 mm from the apical end at three levels. GPOA and its sum from the three levels sum of GPOA (sGPOA%) were calculated using digital stereomicroscope. **Statistical Analysis:** At each sectioned level, GPOA% was compared with the score of tug-back sensation using one-way ANOVA at a 5% significance level. Multiple pairwise comparisons were performed using Tukey test.

Results: Tug-back sensation was present in all canals, described as slight, adequate, and strong in 4, 8, and 8 canals, respectively. Among the tug-back scores, quantitative analyses of GPOA% showed significant differences at 2- and 3-mm levels. The strong tug-back with sGPOA of 76.5 ± 11.1% was significantly higher than that of slight tug-back.

Conclusions: Under the conditions of this study, the tug-back scoring system can be applied to determine the amount of GP adaptation inside the root canal. Strong tug-back sensation showed the highest GP adaptation although at least one-fifth of the apical canal region was left unfilled.

Keywords: Distance, Gutta-percha adaptation, Gutta-percha-occupied area, tug-back

Inter and Intra-Examiner Reliability of Pulp Ulcer Fistula Abscess Index in the Representative Sample of Students in Saudi Arabia

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Journal of Dentistry and Oral Disorders, 2016 Oct;2(7):1037, 1-5.

Introduction: No studies have been conducted in Saudi Arabia to assess the reliability of PUFA (Pulp Ulcer Fistula Abscess Index) which is indeed to analyze the functionality and reproducibility for giving a true and unbiased burden of untreated caries.

Methods: This cross-sectional study was conducted at Alnaeem Ibn Hammad Intermediate School from March 1st till 5th. One hundred and forty six students were examined for consequences of caries using PUFA/pufa (permanent/primary) indices. Kappa statistics was calculated for inter and intra-examiner reliability on the same time and for day 1 and 2 in both dentitions.

Results: For day 1 and 2 we found substantial to moderate agreement among two observer for different units of PUFA and pufa scale and for over all scale for primary and permanent dentition. For first observer we found substantial agreement for marking pulpal involvement, fistula, abscess and overall PUFA score. For the second observer we found almost perfect agreement for marking pulpal involvement and overall PUFA score with kappa statistics of 0.90 (CI: 0.82- 0.97 and 0.849 (CI: 0.75- 0.93) respectively. Intra-reliability for first observer had moderate agreement for marking pulpal involvement and overall pufa scores while for second observer we found substantial agreement for marking pulp and overall pufa score with kappa statistics 0.73 (CI: 0.50- 0.96) and 0.66 (CI: 0.41- 0.90) respectively.

Conclusion: Through this study we conclude that PUFA scale is reproducible and functional in determining burden of untreated caries in both primary and secondary dentition as results of over study indicate perfect to fair agreement of inter and intra examiner reliability. Further multicenter studies are recommended to support such findings.

Keywords: Pulp ulcer fistula abscess index; Inter-intra examiner reliability; Saudi Arabia

Biocompatibility Evaluation of EndoSequence Root Repair Paste in the Connective Tissue of Rats

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Journal of Endodontics, 2016 Oct;42(10):1523-1528.

Introduction: The aim of this study was to evaluate the subcutaneous connective tissue response to EndoSequence root repair paste (Brasseler, Savannah, GA) compared with mineral trioxide aggregate (MTA).

Methods: Thirty-six Wistar rats each received 3 sterile tubes, containing 1 of the tested materials and control. The animals were killed 1, 3 and 6 weeks after implantation. The specimens were evaluated histologically for type of inflammation, intensity and extent of inflammatory cells, foreign body reaction, fibrous capsule thickness, perivascular fragments, calcific deposits and vascular congestion.

Results: EndoSequence provoked severe inflammation after 1 week, which was significantly different from MTA and control ($P < .05$), with fragmented particles and foreign body reaction. MTA showed tissue-tolerance features almost comparable to control.

Conclusions: EndoSequence was significantly more irritating than MTA and control at 1 and 3 weeks in terms of severity and extent of inflammation. After 6 weeks it displayed more biocompatible characteristics.

Keywords: EndoSequence root repair material; bioceramics; biocompatibility; mineral trioxide aggregate.

Fracture Resistance of Endodontically Treated Mandibular First Molars with Conservative Access Cavity and Different Restorative Techniques: An In Vitro Study

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Australian Endodontic Journal, 2016 Dec;42(3):124-131.

Abstract: The aim was to investigate in vitro the fracture resistance (FR) of endodontically treated teeth (ETT) with conservative access cavity restored using various direct and indirect restorative materials and techniques. Seventy-two mandibular first molars were equally divided into six groups. Teeth in Group 1 were untreated (controls). In Groups 2, 3, 4, 5 and 6, teeth were restored with amalgam, composite resin, ceramic inlay, ceramic onlay and zirconium crown, respectively. A fracture test was performed on all teeth using a static load. Compared with other groups, teeth in Groups 3 ($P < 0.05$) and 6 ($P < 0.05$) had the highest FR values with no significant difference in-between them. Teeth in Group 4 had the lowest FR than other groups ($P < 0.05$). All restorative techniques tested led to a significant reduction in FR. It is necessary to consider type of fracture when evaluating fracture resistance of endodontically treated teeth. Crowned molars had the highest favourable fractures among the five treatment groups. Although the results of this in vitro study showed variations between tested techniques in ETT with a conservative access cavity, further long-term controlled clinical trials are required to confirm these in vitro findings.

Keywords: cuspal coverage; endodontically treated mandibular molar; failure mode; fracture resistance; restorative techniques.

Vertical Load Induced with Twisted File Adaptive System during Canal Shaping

Ahmed Jamleh, Khalid Alfouzan

Journal of Endodontics, 2016 Dec;42(12):1811-1814.

Introduction: To evaluate the vertical load induced with the Twisted File Adaptive (TFA; SybronEndo, Orange, CA) system during canal shaping of extracted teeth by comparing it with the Twisted File (TF, SybronEndo), ProTaper Next (PTN; Dentsply Maillefer, Ballaigues, Switzerland), and ProTaper Universal (PTU, Dentsply Maillefer) systems.

Methods: Fifty-two root canals were shaped using the TFA, TF, PTN, or PTU systems (n = 13 for each system). They were shaped gently according to the manufacturers' instructions. During canal shaping, vertical loads were recorded and shown in 2 directions, apically and coronally directed loads. The vertical peak loads of 3 instrumentation stages were used for comparison. The effects of rotary systems on the mean positive and negative peak loads were analyzed statistically using the Kruskal-Wallis and Mann-Whitney tests at a confidence level of 95%.

Results: The overall pattern of the instantaneous loads appeared to increase with the use of successive instruments within the system. During canal shaping in all groups, the apically and coronally directed peak loads ranged from 0.84-7.55 N and 2.16-2.79 N, respectively. There were significant differences in both

peak loads among the tested systems at each instrumentation stage. TFA had the lowest apically directed peak loads. In terms of coronally directed peak loads, the TFA and TF had a significantly lower amount of loads developed with their instruments than PTN and PTU.

Conclusions: The choice of instrument system had an influence on the loads developed during canal shaping. TFA instruments were associated favorably with the lowest values of peak loads followed by TF, PTN, and PTU.

Keywords: ProTaper Universal; ProTaper next; Twisted File; Twisted File Adaptive; vertical load.

Type II Dens Evaginatus of Maxillary Central Incisor: An alternative approach

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Saudi Endodontic Journal, 2015 Jan;5(1):61-64.

Abstract: Dens evaginatus is the developmental anomaly of tooth that exhibits protrusion of a tubercle from occlusal surfaces of premolar, and lingual surfaces of maxillary central incisor and lateral incisors. Dens evaginatus is common in Caucasian population. Saudi Arabia is also well evidenced of such cases. These tubercles have an enamel layer covering dentin core containing a thin extension of pulp. These cusp-like protrusions are susceptible to pulp exposure from wear or fracture because of malocclusion. Type II dens evaginatus involves normal pulp with immature root apex. Materials to enhance the pulpal recession or pulpotomy procedures indicated in such cases require long time and efforts to ensure pulpal recession or root maturity, respectively. Also prolonged treatment has risk of fracture of the cusp and reinfection and requires patient commitment for the follow-up procedures. Present case describes the use of mineral trioxide aggregate (MTA) in type II dens evaginatus of maxillary central incisor.

Keywords: Dens evaginatus, morphodifferentiation, mineral trioxide aggregate

Marginal Adaptation of Mineral Trioxide Aggregate (MTA) to Root Dentin Surface with Orthograde/Retrograde Application Techniques: A Microcomputed Tomographic Analysis

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Journal of conservative dentistry: JCD, 2015 Mar;18(2):109-115.

Background: Achieving a good apical seal for root canals is known to be associated with good mineral trioxide aggregate (MTA) adaptation to dentin.

Aims: This study aims to compare the marginal adaptation of MTA with root dentin between orthograde and retrograde application techniques using microcomputed tomography (micro-CT) analysis.

Settings and design: Fifty-two single-rooted human teeth were divided into four equal groups: (Group 1) Retrograde MTA (RMTA), (Group 2) Orthograde MTA (OMTA), (Group 3) Etched RMTA (ERMTA), and (Group 4) Etched OMTA (EOMTA).

Materials and methods: For Group 1, 3-mm retrograde cavities were prepared and filled with MTA. For Group 2, the apical 6 mm of the canals were filled with MTA and sealed with sealer cement and warm gutta-percha. In Groups 3 and 4, canals were treated the same as Groups 1 and 2, respectively, except

that before placing the MTA, canals were irrigated with 17% ethylenediaminetetraacetic acid (EDTA). After 48 hours, all the teeth were analyzed using a micro-CT scanner.

Statistical analysis: Mean dentin-MTA contact and the mean length and width of each gap was analysed using one-way analysis of variance (ANOVA). Statistical significance was set at an α level of 5%.

Results: No significant difference in gap volumes was observed in the dentin-MTA adaptation in both orthograde and retrograde application techniques. However, significant difference in the gap volumes was observed between RMTA and ERMTA ($P = 0.045$). Etching significantly improved the MTA-Dentin adaptation ($P < 0.05$). The type of application technique did not significantly improve the dentin-MTA adaptation, instead with the use of 17% EDTA, a significant improvement could be achieved.

Conclusion: Within the limitations of the present study, it concludes that MTA adaptation to dentin tooth structure is not significantly different between an orthograde and retrograde approach. However, the use of EDTA significantly improved the MTA-Dentin adaptation.

Keywords: Acid etching; marginal adaptation; microcomputed tomography; mineral trioxide aggregate.

Histological Evaluation of the Root Apices of Failed Endodontic Cases

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Saudi Endodontic Journal, 2015;5(2):120-124.

Aim: The aim of this histological study was to evaluate the different causes of the failures of the endodontic treatment.

Materials and Methods: Adult patients who were referred for endodontic surgery and for whom root-end resection was considered suitable were invited to participate in this study. The inclusion criteria were: (1) Patients aged between 18 and 65 years; (2) teeth with apical periodontitis that was diagnosed radiographically; (3) the tooth could not be adequately and better managed by root-canal retreatment; and (4) the crown of the tooth was adequately restored. One hundred root apices were surgically removed together with the periapical pathological tissue from 92 patients (56 males and 36 women). Histological sectioning was performed on calcified specimens that were embedded in a suitable medium.

Results: The causes of endodontic failure identified through histological evaluation were as follows: Presence of bacterial and debris into canals (51%), apex transposition and overfilling (3%), presence of the isthmus (21%), bacterial colonization of root surface (2%), untreated canals (11%), and filling material outside root canal (4%). There was no significant difference between the distribution of teeth and the causes of endodontic failures ($P = 0.32$).

Conclusions: The present study demonstrated that the most common cause of endodontic failure is the insufficient cleaning of the root canal system. It also explores the effectiveness of histological evaluation of the root apex following root-end resection in exploring the causes of endodontic failures.

Keywords: Apical third, bacteria, debris, endodontic failure, histology

The use of Dental Operating Microscopes by Endodontists in the Middle East: A report based on a questionnaire

Mansour Alrejaie, Nada M. Ibrahim, ***Manjunath H. Malur, Khalid AlFouzan***

Saudi Endodontic Journal, 2015;5(2):134-137.

Objectives: The purpose of this study was to determine how the Dental Operating Microscope (DOM) is currently being accepted for usage by endodontists in the Middle East.

Materials and Methods: A one-page letter and auto-return upon completion computer-based questionnaires were e-mailed to most of the active members of the Middle Eastern endodontic associations.

Results: Out of the 47% that are using the DOM, only 35% answered yes to using the DOM as much as anticipated. The reasons for not using the DOM as much as anticipated were positional difficulties (80%) and increased treatment time (75%). The majority of endodontists reported that they always use it during retrieval of separated instruments, negotiating calcified canals and surgical treatment.

Conclusions: The findings revealed that endodontists in the younger age-groups are more accepting of the DOM. It was also found that the endodontists that are using the DOM in their practice are not using it as often as they anticipated.

Keywords: Dental operating microscope, osseous resection, root-end filling

Effect of Cervical Preflaring on Initial Apical File Size Determination in Maxillary Central Incisors and First Molars

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Journal of Advanced Oral Research, 2015 Sep-Dec; 6(3):30-33.

Background: Cervical or coronal preflaring allows a more accurate assessment of the apical diameter of the root canal. This article investigates the influence of cervical preflaring - using different rotary instruments on the determination of initial apical width of the canal.

Materials and Methods: 40 maxillary central incisors and maxillary first molars were assigned for this study. Actual canal length (working length [WL]) was determined with patency file. The teeth were divided into four Sub groups - Sub Group A had no preflaring. Sub Group B - preflaring with Gates Glidden. Sub Group C - preflaring with Quantec Flare series instruments. Sub Group D - preflaring with LA (line angle) Axxess burs. Each canal was instrumented starting with size 08 files and file sizes were increased until a binding sensation was felt at the WL. The apical region was then observed under a stereomicroscope, and the differences between a root canal and maximum file diameters were evaluated for each sample.

Results: Significant differences were found among experimental groups regarding anatomical diameter at the WL and the first file to bind in the canal ($P < 0.0001$, 95% confidence interval). The major discrepancy was found when no preflaring was performed (0.172 mm for incisors and 0.162 mm for molars average). The LA Axxess burs produced the smallest differences between anatomical diameter and first file to bind (0.03 mm for incisors and 0.042 mm for molars average). Gates Glidden drills and flare instruments were ranked in an intermediary position, with no statistically significant differences between them.

Conclusion: From the present study, it can be inferred that the canals preflared with LA Axxess burs presented the lowest discrepancy values between the file size and anatomical diameter, thus proving its role as an adjunct in root canal preparation procedures.

Keywords: Cervical preflaring, initial apical file size, line angle Axxess burs

Root Surface Strain During Canal Shaping and its Influence on Apical Microcrack Development: A Preliminary Investigation

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International Endodontic Journal, 2015 Dec; 48(12):1103-1111.

Aim: To determine the root surface strain (RSS) generated during root canal shaping and its effects on apical microcrack development.

Methodology: Twenty-five extracted human mandibular premolars were selected and decoronated. The teeth were instrumented with either the ProTaper (PT) or WaveOne (WO) (Dentsply Maillefer) NiTi rotary systems (n = 10 per group) or used as controls (n = 5). Instrumented root canals were enlarged to ProTaper F4 (size 40, 0.06 taper) or using WaveOne LARGE (size 40, 0.08 taper) instruments according to the manufacturer's instructions. An electrical strain gage (KFG02-120-C1-16, Kyowa Dengyo, Tokyo, Japan) was fixed on the proximal root surface and connected to a strain amplifier via a bridge box in order to measure RSS. During canal shaping, the strain output of the amplifier was recorded. The instantaneous RSS induced by each instrument and the maximum RSSs were determined. All teeth were then stained with contrast media and imaged with micro-computed tomography (micro-CT) at an isotropic resolution of 10 μm to detect microcracks. The mean maximum RSS values (microstrain) and mean number of microcracks recorded for both groups were tested for statistical significance using Mann-Whitney U-test. Presence/absence of microcracks in both groups was compared by chi-square tests.

Results: Increased baseline RSS from strain accumulation during canal shaping was observed, with similar maximum RSS (mean ± SD) for PT (416.6 ± 185.1 μstrain) and WO (398.2 ± 163.8 μstrain) (P = 0.94). The interevaluator reliability for microcrack detection using micro-CT had a kappa value of 0.998. Compared to the PT group, there was a trend for fewer samples with microcracks in the WO group (P = 0.051). On the micro-CT images, apical microcracks were detected in 20 PT and 11 WO samples (P = 0.10). The microcracks were observed in the buccolingual direction in all WO and 81% of PT samples. No vertical root fractures were found. The maximum RSS obtained during canal shaping was poorly correlated with the number of microcracks found (R(2) = 0.093).

Conclusions: Based on these preliminary data, canal shaping appears to cause apical microcracks regardless of the type of rotary instrument motion. Contrast-enhanced micro-CT was able to identify microcracks in roots.

Keywords: continuous rotary motion; contrast media; micro-CT; microcrack; reciprocating rotary motion; surface tooth strain.

A New Classification of Endodontic-Periodontal Lesions

Khalid S. Al-Fouzan.

International Journal of Dentistry, 2014 Apr;2014.919173:1-5.

Abstract: The interrelationship between periodontal and endodontic disease has always aroused confusion, queries, and controversy. Differentiating between a periodontal and an endodontic problem can be difficult. A symptomatic tooth may have pain of periodontal and/or pulpal origin. The nature of that pain is often the first clue in determining the etiology of such a problem. Radiographic and clinical evaluation can help clarify the nature of the problem. In some cases, the influence of pulpal pathology may cause the periodontal involvement and vice versa. The simultaneous existence of pulpal problems and inflammatory periodontal disease can complicate diagnosis and treatment planning. An endo-perio lesion can have a varied pathogenesis which ranges from simple to relatively complex one. The differential diagnosis of endodontic and periodontal diseases can sometimes be difficult, but it is of vital importance to make a correct diagnosis for providing the appropriate treatment. This paper aims to discuss a modified clinical classification to be considered for accurately diagnosing and treating endo-perio lesion.

Endodontic instruments after torsional failure: nanoindentation test

Ahmed Jamleh, Alireza Sadr, Naoyuki Nomura, Arata Ebihara, Yoshio Yahata, Takao Hanawa, Junji Tagami, Hideaki Suda.

Scanning: The Journal of Scanning Microscopies, 2014 Jul-Aug;36(4):437-443.

Abstract: This study aimed to evaluate effects of torsional loading on the mechanical properties of endodontic instruments using the nanoindentation technique. ProFile (PF; size 30, taper 04; Dentsply Maillefer, Switzerland) and stainless steel (SS; size 30, taper 02; Mani, Japan) instruments were subjected to torsional test. Nanoindentation was then performed adjacent to the edge of fracture (edge) and at the cutting part beside the shank (shank). Hardness and elastic modulus were measured under 100-mN force on 100 locations at each region, and compared to those obtained from the same regions on new instruments. It showed that PF and SS instruments failed at 559 ± 67 and 596 ± 73 rotation degrees and mean maximum torque of 0.90 ± 0.07 and 0.99 ± 0.05 N-cm, respectively. Hardness and elastic modulus ranged 4.8-6.7 and 118-339 GPa in SS, and 2.7-3.2 and 52-81 GPa in PF. Significant differences between torsion-fractured and new instruments in hardness and elastic modulus were detected in the SS system used. While in PF system, the edge region after torsional fracture had significantly lower hardness and elastic modulus compared to new instruments. The local hardness and modulus of elasticity of endodontic instruments adjacent to the fracture edge are significantly reduced by torsional loading.

Keywords: elastic modulus; hardness; nanoindentation; nickel-titanium; stainless steel.

Incidence of Canal Systems in the Mesio-Buccal Roots of Maxillary First and Second Molars in Saudi Arabian Population

Khalid S. Al-Fouzan, Hani F. Ounis, Khalid Merdad, Khalid Al-Hezaimi.

Australian Endodontic Journal, 2013 Dec;39(3):98-101.

Abstract: The aim of this prospective study was to determine the number of canals treated in the mesio-buccal roots of the maxillary first and second molars teeth of a Saudi Arabian population during a 1-year period in a postgraduate endodontic program. The attending endodontic faculty member supervising the case verified the number of canals in the teeth clinically and radiographically. In total, 308 maxillary first molars and 162 maxillary second molars, of which 158 (51.3%) and 32 (19.7%) met the criterion of having two canals detected and treated in the mesio-buccal root of the maxillary first and second molars, respectively. It was concluded that the occurrence of mesio-palatal canal in the mesio-buccal root of the maxillary first and second molars of a Saudi Arabian population was high. The fact that almost more than half the mesio-buccal roots of the maxillary first molars bear two canals is enough reason to always assume that two canals exist until careful examination proves otherwise.

Keywords: maxillary first molar; maxillary second molar; mesio-buccal root; mesio-palatal canal; root canal.

The Acceptance of Dental Operating Microscope among Advance Education Specialty Programs in Endodontics in the Middle East

Mansour Alrejaie, Nada M. Al-Ibrahim, ***Khalid Al-Fouzan***.

Saudi Endodontic Journal, 2012 Jan;2(1):19-21.

Aim: To present the current situation of dental operating microscopy (DOM) training in the available Advance Specialty Education Programs in Endodontics in Arab Middle-Eastern countries.

Materials and Methods: A web-based survey was sent to the electronic mail address of Advance Specialty Education programs of 15 Arab and middle east countries. The questions were limited to those who have an advanced specialty education program in Endodontics at their University if they are using an operating microscope?

Results: Out of 15 countries, only 4 countries have microscopic technology in their Advance Education Programs in Endodontics.

Conclusion: Few Arab Middle-Eastern countries have DOM in their advance education programs in endodontics. The highest authority in advancing endodontic education in the Arab Middle-East should consider in the near future the importance of this technology as standard care in teaching advance endodontics. An advance workshops should be organized regularly to provide enough knowledge about this standard educational technology.

Keywords: Advance education programs in endodontics, arab middle-east, dental operating microscope

Incidence of Two Canals in Extracted Mandibular Incisors Teeth of Saudi Arabian Samples

Khalid S. Al-Fouzan, Abdulatif AlManee, Jilan Jan, Mansour Al-Rejaie.

Saudi Endodontic Journal. 2012 May 1;2(2):65-69.

Aim: The purpose of this *in vitro* study is to provide clinical data on the presence of the second canal in mandibular incisor teeth of Saudi Arabian Samples.

Materials and Methods: Eighty extracted human mandibular incisors were collected from Saudi patients. The teeth were accessed by small round bur then placed in 5.25% sodium hypochlorite for 24 hours to dissolve the organic debris. Indian ink was injected inside the root canal systems under negative pressure. The teeth were decalcified in 5% nitric acid for three days then dehydrated in different concentrations of ethyl alcohol. Following the decalcification process, the teeth were cleared in methyl salicylate and evaluated according to Vertucci's classification.

Result: Fifty six of both mandibular central and lateral incisor teeth (70%) had type I canal configuration (one main canal and one main apical foramen), while the remaining 30% of the sample (24 teeth) had a type III canal configuration (two separate canals and merged into one canal before exiting the tooth through single apical foramen).

Conclusion: The incidence of two canals in mandibular incisor teeth is about one third of the examined Saudi Arabian samples with no difference between the centrals and laterals. The clinician should deal with these teeth as if they have two canals unless it is proved otherwise.

Keywords: Canal configuration, decalcification and clearing, mandibular incisors, root canal anatomy, Saudis

Variable Taper Nickel-Titanium Rotary Instrument Technique

Khalid S. Al-Fouzan.

Saudi Endodontic Journal. 2011 Jan 1;1(1):27-32.

Abstract: Removal of all organic debris and microorganisms from the root canal system, and shaping the root canal space is a very important step in root canal therapy. This will facilitate adequate irrigation and filling of the entire root canal space. A number of techniques using hand instruments have been described, all of which have been designed to produce a tapered preparation. These techniques have a lot of deficiencies, but they are still considered to be the most efficient and suitable for clinical dental practice. Research into root canal preparation has led to significant changes in instrumentation techniques. New instruments have been developed, employing different metals and different engineering philosophies. There has been a significant move away from the ISO standard 2% taper instrumentation. Recent designs of endodontic instruments have variable tapers giving improved shaping ability. Nickel-titanium rotary instruments will rapidly and safely open the main root canals creating a deep space to permit full penetration of irrigant solutions. Practitioners considering changing their endodontic techniques, are advised to read the following preparation technique to gain competence before using these instruments in their clinical practice.

Keywords: Standard preparation, step-down preparation technique, crown down preparation technique, Nickel titanium files

Oral Medicine

2.3 ORAL MEDICINE

Gingival Leukoplakia: Hyperkeratosis with Epithelial Atrophy Is A Frequent Histopathologic Finding.

Lama Alabdulaaly, Asma Almazyad, Sook-Bin Woo

Head and Neck Pathology. 2021 May 31, ahead of print.

Abstract: White lesions on the gingiva and palatal mucosa may represent reactive keratoses, including specific diseases such as benign alveolar ridge keratosis, or nonreactive keratoses, such as true leukoplakia, the latter being associated with a high recurrence rate at this site. The aim of this study is to determine the histopathologic features of gingival keratoses. Hyperkeratotic lesions from the gingiva, palatal mucosa, and alveolar ridge mucosa were available for evaluation after excluding specific keratotic lesions such as candidiasis. There were 321 biopsies from 296 patients and approximately half of the cases (159/321, 49.5%) were reactive keratoses. The rest of the 162 biopsies from 149 patients (76 females; 51.0%) represented true leukoaplakias. The most common location was the gingiva (73.2%) followed by the palatal mucosa (17.0%). Hyperkeratosis/parakeratosis not reactive (HkNR) represented 43.8% of cases; 45.7% were dysplasia or carcinoma, and the rest were not readily classifiable as reactive or non-reactive keratoses. Histopathologic features commonly noted in the HkNR lesions include sharp demarcation (72.7%), corrugated surface (53.5%), and epithelial atrophy (48.1%). A lymphocytic band was noted in 8.5% of the cases, mostly associated with epithelial atrophy (5/6 cases). Seven patients with 17 biopsies from noncontiguous sites likely had proliferative leukoplakia; the most common location was the gingiva (88.2%) and the most common diagnosis was HkNR (52.9%). HkNR is a common histopathologic diagnosis for leukoplakias on the gingiva, and these lesions frequently exhibit thick hyperkeratosis, epithelial atrophy and a lymphocytic band at the interface.

Keywords: Atrophy; Gingiva; Keratosis; Leukoplakia; Oral; Recurrence.

Caring for cancer patients during COVID-19 global pandemic: Risk factors and precautionary principle.

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International Journal of Clinical Practice, 2021 Jun;75(6):e14141

Abstract: The current global pandemic COVID-19 challenges oncologists to reorganise cancer care in order to strikingly reduce hospital visits and admissions. Cancer patients are more susceptible to infections and likely to get severe consequences compared with other patients. Health-care facility services are quickly changing their systems and workflow in response to the global pandemic COVID-19 crisis. These alterations mitigate infection risks and give profound effects on crucial aspects of care, including patients with cancer. Here, we discuss the current situations and a roadmap for cancer care during the COVID-19 crisis. In the prevalence of global cancer and higher transmission of pandemic COVID-19, there is an urgent need to realise the effect of SARS-CoV-2 infection and their related life-threatening outcomes specifically for cancer patients.

Rapid morphologic and molecular activation of microglial cells by stimulation of the P2X7 2 receptor correlates with increased pressure and neuronal loss.

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Research Square April 2021, ahead to print.

Background: The endogenous signals leading to microglial activation represent central components of neuroinflammatory cascades. Given ATP release accompanies mechanical strain to neural tissue, and the P2X7R for ATP is expressed on microglial cells, we examined the morphological and molecular consequences of P2X7R stimulation *in vivo and in vitro* in detail to enhance understanding of the response.

Methods: IL-1β release was determined with ELISA. Expression of mRNA used qPCR. ATP release was determined with the luciferin/luciferase assay while fura-2 indicated cytoplasmic calcium. Microglial migration used Boyden chambers. Morphological changes were quantified from Iba1- immunostained cells.

Results: Sholl analysis of Iba1-stained cells showed retraction of microglial ramifications one day after injection of P2X7R agonist BzATP into mouse retinae. Mean branch length also decreased, while cell body size and expression of *Nos2, Tnfa, Arg1, Chil3* increased. BzATP induced similar morphological changes *in ex vivo* tissue isolated from Cx3CR1-GFP mice, suggesting cell recruitment was unnecessary. Primary microglial cultures were developed to investigate the autonomous nature of the response. Isolated microglial cells expressed P2X7R, while increased intracellular Ca^{2+} triggered by BzATP and blocked by antagonist A839977 confirmed functional expression. BzATP induced process retraction and cell body enlargement within minutes in isolated microglial cells, and increased expression of *Nos2* and *Arg1*. BzATP both increased expression of IL-1β, and triggered a substantial release, suggesting P2X7R both primes and activates the NLRP3 inflammasome. ATP increased microglial migration, but this required 3 P2Y12R, not P2X7R involvement. As ATP release often accompanies mechanical strain, responses to intraocular pressure elevation were determined. Transient elevation increased ATP release and led to microglial process retraction, cell body enlargement and gene upregulation resembling the responses to BzATP injection. These pressure-dependent changes to microglia were reduced in $P2X7R^{-/-}$ mice. Critically, the loss of retinal ganglion cell neurons accompanying increased pressure was correlated with microglial activation in C57Bl/6J, but not $P2X7R^{-/-}$ mice.

Conclusions: P2X7R stimulation induced morphological and molecular markers of activation in retinal microglial cells *in vivo* and *in vitro*, affecting IL-1β release and rapid process retraction but not cell migration. Parallel responses accompanied transient pressure elevation, suggesting ATP release and P2X7R stimulation contribute to the microglial response to rising pressure.

Keywords: Microglial activation, P2X7 receptor, neuroinflammation, mechanical strain, IL-1β, NLRP3 inflammasome, Sholl analysis, migration.

Combination of Levamisole with Prednisone in Treating Recurrent Major Aphthous Ulcer in a Young Boy: A Case Report.

Jyoti Prajapat, Rajesh Prajapat, ***Sanjeev B. Khanagar,*** Satish Vishwanathaiah, Sachin Naik, Chitra Jhugroo, Darshan Devang Divakar.

Clinics and Practice. 2021 May; 11(2):250-256.

Abstract: Recurrent aphthous stomatitis (RAS) is an oral condition characterized by painful oral ulcerations. While the clinical features of this disease are easily defined, the etiology remains unclear. Thus, existing treatments are still unsatisfactory in reducing the severity, healing, and recurrence rate; however, there is no permanent and definitive treatment. Effective treatment for aphthous stomatitis is not available, and those treatments available mainly focus on suppressing its symptoms. We are reporting a case of a 17-year-old boy who presented with a 3-year history of multiple recurrent major ulcers in the oral

cavity. Levamisole with steroids has been used in many clinical trials to treat aphthous ulcers, showing an improvement in pain, discomfort, healing time, and reduction in the number of ulcers. The same method was used to treat our patient, who showed promising results, with no recurrence for one year. Levamisole is a safe, easily tolerable and promising drug for the treatment of RAS.

Keywords: major aphthous ulcers; canker sores; immunomodulators; corticosteroids; levamisole; visual analogue scale

Dental Practitioners' and Students' knowledge of Medication related Osteonecrosis of the Jaw

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Saudi Pharmaceutical Journal, 2021 Jan; 29(1):96-103.

Background: Medication-related osteonecrosis of the jaw (MRONJ) is a complication affecting patients who are being treated with antiresorptive or antiangiogenic medication. These patients require meticulous treatment planning and management strategies. This research aimed to assess the knowledge of dental practitioners and students in their professional years regarding MRONJ.

Methods: A cross-sectional study was conducted among 345 dental practitioners and students in their professional years of both genders, in governmental and private dental schools. The data was collected using an electronic and paper-based self-administered structured questionnaire with six sections. The data was entered and analyzed using SPSS Version 23, and a P-value <0.05 was considered significant. A Chi-square test was used to compare the categorical variables.

Results: Though more than half of the sample 68% received information about antiresorptive and antiangiogenic drugs during their studies, the level of knowledge was low. The primary diseases targeted by antiresorptive and antiangiogenic medications were not known by the majority of the sample. Almost half of the sample could not identify any antiresorptive or antiangiogenic medication and only 28.1% knew the correct definition of MRONJ.

Conclusion: The level of knowledge regarding MRONJ is a concern, necessitating more educational courses and workshops.

Keywords: MRONJ; Knowledge; Bisphosphonates; Dental practitioners; Dental students; Cancer treatment; Side effects; Management

Association of Oral Parafunctional Habits with Anxiety and the Big-Five Personality Traits in the Saudi Adult Population

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The Saudi Dental Journal, 2021 Feb; 33(2):90-98.

Background: Oral parafunctional habits are related to any abnormal hyperactivity of the oromandibular system. They are prevalent in all societies in varying intensity and have potential physical and psychological implications. The aim of this study was twofold: (1) to determine the prevalence of various types of oral parafunctional habits in the Saudi adult population, and (2) to examine their association with and the level of anxiety and personality factors.

Methods: This cross-sectional study was conducted with an electronic data collection form distributed to the public through social media. The questionnaire comprised of the following: (a) demographic information, (b) the Hamilton Anxiety Rating Scale (HAM-A), (c) the Ten-Item of Big-Five Personality Traits, (d) a list of oral parafunctional habits. Data were analysed using a Pearson's Chi square and binary logistic regression.

Results: The participants reported several parafunctional habits including daily gum chewing (86%), lip/object biting (59%), clenching (45%), nail biting (36%) and grinding (32%). Males were 3 [2.3–3.7] times and younger age groups were 1.5 [1.1–2.0] times more likely to be associated with nail biting compared to their counter groups (adj. P < 0.001 and adj. P = 0.007). Lip/object biting was significantly 1.3 [1.1–1.7] times more prevalent in males (adj. P = 0.015). Participants who reported being extroverts were more likely to be associated with clenching (46.4%) (P = 0.024). An emotionally stable person was significantly less likely to be associated with nail biting (28.4%), grinding (24.9%), clenching (35.8%), and lip/object biting (48.4%) (P < 0.001each). Participants who reported conscientiousness and emotional stability were significantly less associated with TMD (P = 0.007, P < 0.001).

Conclusion: Oral parafunctional habits are highly prevalent in the Saudi adult population in varying degrees. Possible risk factors include males, younger age groups, single people, and being financially constrained.

Keywords: Para-functional; Nail biting; Bruxism; Personality factors; Saudi population;

Bell's Palsy: A Prospective Study

Ahmed Hassan Kamil Mustafa, Ahmed Mohammed Suleiman.

International Journal of Dentistry, 2020 Apr; 2160256.

Background. Bell's palsy is an acute idiopathic facial nerve paralysis of sudden onset. It is the most common cause of lower motor neuron facial nerve paralysis with an annual incidence of 15–30 per 100,000 population. The objective of this work is to study the grade of the attack and the associated symptoms of Bell's palsy in a group of Sudanese patients. The study type is an analytical prospective-based study. The study was carried out at Khartoum Teaching Dental Hospital, Khartoum General Teaching Hospital. In this prospective of the study, 48 patients with Bell's palsy were evaluated using the House–Brackman scale in relation to the above mentioned variables.

Results. The study showed 18 patients (37.5%) were grade II, and 24 patients (50%) had postauricular pain before and during the attack. By the end of the study period, 40 patients recovered completely (83.3%), and 8 (16.7%) patients did not recover completely, 5 (10.4%) patients complained of hearing changes during the attack, and 13 (27.1) patients gave a history of exposure to cold before the attack.

Conclusion. Based on our prospective study, we conclude that the percentage of complete recovery decreases with increased severity of the attack at onset. We failed to demonstrate any relation between postauricular pain and prognosis of Bell's palsy. The percentage of taste changes in our study is low in comparison with those obtained in the literature. In addition, all the patients showed complete regain of taste sensation. The percentage of patients with hearing changes in our study is high compared with some studies. In literature, we have no explanation for that, and it may be related to severity of the attack. In the present study, we found a strong association between exposure to cold and development of Bell's palsy. As the number of patients in our study is small and there is a limited period of follow-up, the study may not reflect the real situation; therefore, we need a large population-based study.

Microwave-assisted tissue processing, fixation and staining in tissues of different thicknesses: A comparative study

Mahesh Rao, Shaila M. Pai, ***Sanjeev Balappa Khanagar, Salman Siddeeqh***, Darshan Divakar Devang, Sachin Naik

Journal of Oral Maxillofacial Pathology, 2020 Apr;24(1):186.

Aim and objectives: The study aimed at assessment of microwave assisted tissue fixation, processing and staining and to determine if it can replace standard formalin fixed paraffin embedded processing in tissues of different thickness.

Materials and methods: Specimens from buccal mucosa and gingiva was used in the study and were divided into three different thickness and was fixed, processed and stained according to conventional method and with a use of kitchen microwave oven respectively. The present study is the first of its kind where oral tissues was fixed, processed and stained with a kitchen microwave in three different thickness. The results obtained was statistically analyzed using IBM SPSS Statistics version 21.0 software.

Results: The new technique of fixation, tissue processing and staining using a microwave employed in the present study represented a major change from conventional method and achieved significant reduction in time taken.

Conclusion: The ease of application and speed of this technique significantly reduced turnaround time in diagnostic labs.

Keywords: Fixation; kitchen microwave; processing; staining; thickness.

Familiarity and implementation of academicians of dental schools regarding the application of photodynamic therapy in dentistry: Need to incorporate in the dental curriculum

Mai Soliman, Elzahra a Eldwakhly, Alhanoof Aldegheishem, ***Ahmed Binobaid***, Selma Saadaldin.

Photodiagnosis Photodynamic Therapy, 2020 Sep;31:101897.

Background: The present cross-sectional study aimed to evaluate the knowledge, behavior, and attitudes of academicians from dental schools in Riyadh, Saudi Arabia towards the use of photodynamic therapy (PDT) in dentistry.

Methods: A self-administered questionnaire to a total of 289 academicians from the dental training faculty (DTF) was distributed to six dental schools in Riyadh, Saudi Arabia during 3 months of the study period. The questionnaire consisted of four main sections with 17 items that dealt with: demographic data, awareness, and knowledge of dental academician regarding PDT technique, and the interest of the dental academician in implementation the PDT technique, detailed knowledge, and background about PDT use followed by the role and integration of PDT technique and its theoretical knowledge in the curriculum and clinical practice. Quantitative data were analyzed using frequency distribution. To estimate if general demographics of the participants affect DTF responses regarding PDT knowledge and teaching experience multivariate statistical analyses were carried out according to gender, age, professional experience, and academic rank regarding selected questions.

Results: A total of 238 questionnaires (response rate: 82.3 %) were returned for the analysis. Females responded higher than males. More than 50 % of respondents were age 50 years and less. It is shown that 63 % of DTF indicates familiarization regarding PDT and 67 % and 70 % strongly agree to the fact

that PDT should be incorporated in the dental curriculum and important to acquire knowledge regarding PDT for teaching undergraduate. A remarkable number of 87 % and 74 % showed high interest in participating in lectures and workshops related to PDT and therefore clinically applying the technique in clinical practice, respectively. Multivariate analysis showed a statistically significant difference between the level of knowledge and correct answers with age, professional experience of teaching and academic rank.

Conclusion: Although the DTF involved in the present study demonstrated average knowledge regarding PDT, they, however, consider significantly important and showed a keen interest in acquiring PDT knowledge and adding it in the dental curriculum.

Keywords: Photodynamic therapy, Curriculum, Education, Knowledge, Attitude, Dentistry

Awareness and attitude of patients toward extra-oral examination in dental practice in Riyadh, Saudi Arabia

Ghada Al-Zamel, Mamdouh AlHarbi, Abdullah AlSheraimi, Khalid AlHazmi, Nawaf AlKubedan, Abdulrahman AlEnezi.

Medical Science, 2020;24(104):2573-2578.

Aim: to assess and evaluate awareness and attitude of patients who are seeking dental treatment at both governmental and dental private polyclinics in Riyadh city towards Extra-oral examination (EOE).

Methodology: A total of 661 governmental and private dental clinics visitors were participated in this cross-sectional analytical study. The study was conducted using electronic and paper-based surveys. Participants were asked of total 20 questions, including demographics, Patients' Experience, and Patients' knowledge and attitude toward the Extra-Oral Examination. Finally, the data was entered using Microsoft excel program then analyzed by SPSS program version 24.

Results: There is lack of knowledge about EOE as only 10.9% of participants heard about it. 53.9% do not know about the importance of EOE. 7.9% received EOE in governmental clinics, similarly only 3.4% were examined in private clinics. Vital signs were recorded more often in governmental clinics as 29.2% of participants had their vital signs measured while only 12.2% in private polyclinics.

Conclusion: The performance of Extra-Oral Examination was significantly low for both governmental and private dental clinics. Moreover, the awareness of the sample also was low.

Keywords: Extra-oral examination, vital signs, dental practice, physical assessment

A review of the aetiology of oral cancer in the Sudan

Ahmed Hassan Kamil Mustafa

International Journal of Applied Dental Sciences, 2020 Sep; 6(3):485-489.

Objectives: To focus the light on the aetiology of oral cancer in the Sudan. Numerous reports have shown that the incidence of oral cancer worldwide is on increase. The rising incidence of oral cancer, with the absence of the well established risk factors, has wrung alarm bells.

Material and Methods: Website search (Pubmed central and google scholar) for publications addressing the aetiology of oral cancer in the Sudan, in addition to snuff dipping (Tombak) which is a common habit in Sudan.

Results: During initial search 420 publications were identified, on exclusion of studies related to other countries and other body tumours 36 studies discussing the aetiology of oral cancer in the Sudan were examined.

Conclusions: Toombak is the major contributing factor for oral cancer in the Sudan. The role of other contributing factors such as viruses other than Human Papilloma Virus, other types of tobacco such as smoked tobacco and alcohol still need more investigations.

Keywords: Aetiology, Sudan

Assessing stress associated with temporomandibular joint disorder through Fonseca's anamnestic index among the Saudi physicians

Samar O. Al Hayek, Mashael F. Al-Thunayan, Amjad M. AlGhaihab, Reem A. AlReshaid, Aamir Omair

Clinical and Experimental Dental Research, 2019 Feb;5(1):52-58.

Abstract: The study aims to investigate signs and symptoms of temporomandibular disorders (TMD) among physicians in a tertiary health-care center. It has estimated the level of symptomatology, determined the association with demographic data, and identified the related occupational risk factors. A cross-sectional survey was used, and physicians of genders, all age groups, and nationalities from King Abdulaziz Medical City in Riyadh, Saudi Arabia, were recruited. Subjects who had rheumatic arthritis, osteoarthritis, trigeminal neuralgia, or temporomandibular joint (TMJ) trauma were excluded. The data were collected through a self-administered questionnaire that measured TMD severity and oral parafunctional behaviors. Fonseca's anamnestic index (FAI) and an oral validated behavior checklist were used to assess the signs and symptoms of TMD. A total of 282 physicians participated in the study, and the prevalence of TMD signs among physicians was 37% (106); among them, 88 (83%) were within the light dysfunction category. Female physicians reported significantly higher FAI than males for side-to-side mandibular movement (12% vs. 5%, *P* = 0.04), reporting ear pain (18% vs. 10%, *P* = 0.04), and noticing clicking when chewing or opening the mouth (35% vs. 20%, *P* = 0.006). Younger practitioners (28–31 years old) who reported clicking while chewing or opening the mouth tended to have reported higher TMD dysfunction (35%) than those aged 40 and above (13%; *P* = 0.007). Self-reported signs of TMD were 37% among our population. Information collected from FAI is useful in early diagnosis and prevention of TMD.

Keywords: physicians, prevalence, Saudi Arabia, signs, temporomandibular joint disorders

The nature of association of oral para-functional habits with anxiety and big-five personality traits in Saudi adult population

Nouf Albesher, Modi Aljohani, Misam Alsenani, Ohood Turkistani, Mahmoud Salam, Abel Almutairi

The Saudi Dental Journal, 2019 Feb; 31(Supp):S39-40.

Objective: The aim of this study was to determine the prevalence of various types of oral parafunctional habits and evaluate its association with the level of anxiety and personality traits among the Saudi adult population.

Material and methods: It is a cross-sectional study based on an anonymous, Arabic language electronic survey distributed through social media networks among Saudi public community. Eligible cases were 1403. Study participants were Saudi adults who practiced at least one of the five oral parafunctional habits

(Nail biting, Grinding, Clenching, Lip/object biting, and daily gum chewing). Level of anxiety was measured using Hamilton Anxiety Scale. The Big Five personality traits were evaluated using the Ten-Item Personality Inventory (TIPI) scale. Descriptive statistics (n,%; Mean ± SD), bivariate analytic statistics (Pearson's Chi square, T-test) and binary logistic regression analyses were conducted to determine factors associated with the study outcomes.

Results: The most common reported parafunctional habit was daily gum chewing (86%), followed by lip/object biting (59%). Mild anxiety symptoms were prevalent in 84% of sample. However, very severe anxiety was prevalent in only 2%. The leading personality trait was conscientiousness while extraversion trait had the least mean. A significantly positive relationship was observed between the severity of anxiety levels and most oral parafunctional habits. Conscientiousness and emotional stability traits were significantly related to all oral parafunctional habits. However, extraversion and openness to experience were not significantly associated with any parafunctional habit.

Conclusions: Oral parafunctions showed in this study a high prevalence and were significantly associated with higher anxiety levels and to conscientiousness and emotional stability personality traits.

Role of probiotics in the treatment and prevention of oral malodor/ halitosis: A systematic review

Pragati Ishwar Shringeri, Nusrath Fareed, Hemant Battur, ***Sanjeev Khanagar***

Journal of Indian Association of Public Health Dentistry, 2019 June;17(2):90-96.

Abstract: Oral malodor is a condition which impedes people's social life and self-esteem. With more widespread acceptance of the potential for probiotic intervention providing health benefits for nonintestinal body sites, application of it on alternative target tissues has increased, to obtain more specific and enduring benefits. From the periodontal perspective, several studies have revealed the role of probiotic in the reduction of gingival inflammation. However, the studies of stronger evidence pertaining to the role of probiotics in the treatment and prevention of halitosis is limited. The aim of this study was to determine the role of probiotic strains in the treatment and prevention of oral malodor. Records were searched from various databases such as PubMed/Medline, Cochrane, and EMBASE. Articles published over the past 11 years were identified using the key search terms. A total of 178 records were identified by title/abstracts/full-text articles and were retrieved. After thorough assessment, 11 manuscripts were included in qualitative synthesis in this systematic review. Analysis of studies revealed 666 participants, aged 4–76 years, and about 20 probiotic strains were assigned to the test groups and control groups with a varying follow-up period. The effect size for randomized control trials ranged from 0.08 to 0.7 which suggests low-to-moderate practical significance. The results of this systematic review confirm that more studies are necessary to evaluate the efficacy of probiotics with correct methodological design, in broader population samples, and over longer periods.

Keywords: Halitosis, oral malodor, probiotics, volatile sulfur compound

Candida Bloodstream Infection: Changing Pattern of Occurrence and Antifungal Susceptibility over 10 Years in a Tertiary Care Saudi Hospital

Nawaf Alkharashi, Sameera Aljohani, Laila Layqah, Emad Masuadi, ***Waleed Baharoon,*** Hamad AL-Jahdali, Salim Baharoon

Canadian Journal of Infectious Diseases and Medical Microbiology, 2019 Dec;2015962:1-8.

Background: *Candida* has emerged as one of the most important pathogens that cause bloodstream infection (BSI). Understanding the current *Candida* BSI trends, the dominant species causing disease and the mortality associated with this infection are crucial to optimize therapeutic and prophylaxis measures.

Objectives: To study the epidemiology and to evaluate the risk factors, prognostic factors, and mortality associated with candidemia and to compare these findings with previously published studies from Saudi Arabia.

Design: A retrospective medical record review.

Setting: Tertiary hospital in Riyadh.

Patients and methods: The analysis included all cases of *Candida* blood stream infection who are >18 years old over the period from 2013 to 2018. Continuous variables were compared using the parametric *T*-test while categorical variables were compared using the Chi-squared test.

Main outcome measure: Incidence, resistance, and hospital outcomes in *Candida* blood stream infection.

Sample size: 324 patients.

Results: Three hundred and twenty-four episodes of *Candida* blood stream infections were identified. Median age of patients was 49.7 SD ± 28.1 years, and 53% of patients were males. More than half of the patients had an underlying disease involving the abdomen or laparotomy, 78% had an indwelling intravenous catheter, and 62% had suffered a bacterial infection within 2 weeks prior to candidemia. *Candida albicans* represents 33% of all isolates with decreasing trend overtime. There was an increase in the number of non*albicans Candida* overtime with *Candida tropicalis* in the lead (20%). Use of broad spectrum antibiotics (82%), prior ICU admission (60%) and use of central venous catheters (58%) were the most prevalent predisposing factors of candidemia. Azole resistance was variable overtime. Resistance to caspofungin remained very low (1.9%). Fourteen days crude mortality was 37% for ICU patients and 26.7% in non-ICU patients, while hospital crude mortality was 64.4% and 46.7%, respectively.

Conclusion: There is an increasing trend of non*albicans Candida* blood stream infection. Fluconazole resistance remained low to *C. albicans*. Most isolates remain susceptible to caspofungin, voriconazole, and amphotericin B. *Candida* bloodstream infection is associated with high 14-day hospital mortality.

Awareness about Oral Cancer among Dental and Medical Practitioners in Riyadh, Saudi Arabia: A Cross-Sectional Study

Bahija Basheer, Abdalrhman Alrajhi, Ahmed Alsuawari, Fahad Alotaibi, Hussam Almalki, Faisal Alghanim, Ahmad Jaddoh, Abdulelah Alotaibi, Waleed Albaradie, Nawaf Alotaibi, Khalid Alfozan, Nwaf Alawad

International Journal of Medical Research & Health Sciences, 2019 Dec;8(12): 1-11.

Objective: To assess knowledge, practices, and opinion related to oral cancer among medical and dental practitioners in Riyadh, Saudi Arabia.

Methods: A total of 550 Self-administered questioners were at various private and government hospitals/polyclinics in and around Riyadh. A convenient sampling technique was used to recruit the participants for the study, as it was challenging to obtain the updated lists of practitioners from all government and private medical and dental facilities. Dental practitioners, including general and speciaslist dentists and medical practitioners, including general and specialist medical practitioners, who are generally not involved in the examination of the oral cavity, were excluded from the study.

Results: Among the 550 participants who met the inclusion criteria, 68.9% were males, while the other 31.1% were females. The mean knowledge score related to oral cancer was 9.5 for medical, and 9.7 for dental practitioners, however, the difference was not statistically significant (p=0.392). ANOVA test was applied to evaluate the differences in the mean scores between medical specialists, dental specialists, general medical practitioners (medical GP), and general dentists (dental GP). The mean score for all sub-groups was less than 15; among them, dental specialists had the highest mean score (10.2), followed by medical GP (9.9), dental GP (9.4), and medical specialist (9.2). Nevertheless, the difference between them was not statistically significant (p>0.05).

Conclusion: This research highlights the need to increase knowledge and awareness about oral cancer among practitioners.

Keywords: Dental professionals, Medical professionals, Oral cancer

Medical conditions associated with tooth loss among Saudi adults

Abed Al-Hadi Hamasha, Lolowa Almogbel, Abeer Alshehri, Fatimah Alssafi, Hanan Alghamdi, Alanoud Alajmi, Zainul Ahmad Rajion

Archives of Orofacial Science, 2018 Jan;13(1):16-21.

Abstract: Upon reviewing the literature, the prevalence of many systemic conditions such as diabetes, hypertension, asthma and rheumatoid arthritis were reported to be high in Saudi Arabia. The relationship of these conditions with tooth loss among Saudi population was not investigated. Therefore, the aim of the present study is to explore the relationship between tooth loss and most common medical conditions among Saudi dental patient. The study participants were 250 patients who were randomly selected from the College of Dentistry database of King Saud bin Abdulaziz University for Health Sciences (KSAU-HS) in Riyadh, Saudi Arabia. Participants were requested to answer self-administered questionnaires related to their demographic as well as general health questions concerned to the presence of systemic medical conditions. Missing teeth determined after examining the orthopantogram radiographs and reviewing the Romexis and SALUD databases. Descriptive statistics, independent t-test and linear multiple regression model were performed using SPSS software. The mean number of missing teeth among the study population was 5.8 teeth per person. The mean number of missing teeth was higher among subjects with diabetes, hypertension, rheumatoid arthritis, cardiovascular diseases, or osteoporosis compared to healthy individuals. A multiple linear regression analysis model revealed that diabetes, hypertension and rheumatoid were significant predictors of missing teeth among Saudi population. These results highlight the importance of the effect of medical conditions on oral health.

Keywords: Medical conditions; oral health; Saudi; systemic conditions; tooth loss.

Patterns of Self-Medication Behavior for Oral Health Problems Among Adults Living in Riyadh, Saudi Arabia

Arwa Aldeeri, Haya Alzaid, ***Renad Alshunaiber, Shahad Meaigel***, Naila A. Shaheen, Abdallah Adlan

Pharmacy, 2018 Feb;6(1):15.

Abstract: Self-medication is a widespread behavior worldwide. It is defined as the practice of self-diagnosis and drug prescription without proper professional consultation. **Aim:** To determine the prevalence and predictors of self-medication for oral health problems among adults living in Riyadh city. **Methods:** A cross-sectional study based on a structured close-ended questionnaire was distributed

among adults visiting shopping malls in all different five regions of Riyadh. A two-stage sampling technique was used: cluster and simple random sampling. The questionnaire was composed of two main sections: demographic characteristics and questions assessing the behavior of self-medication. **Results:** The prevalence of self-medication was found to be 63.25%, with a higher prevalence among females than males. Gender and nationality were significantly associated with self-medication. Salt in hot water locally (52.57%) and acetaminophen (47.43%), a type of an analgesic, were, systemically, the most frequently used. Pharmacy shops were the main source of these medicaments (66.01%). Similarly, the advice for using them was mainly given by pharmacists (53.36%). Lack of time was claimed to be the main reason for practicing self-medication (54.55%) with abscess, toothache, and gingival bleeding being the main predictors. **Conclusions:** Self-medication was found to be a common practice among the population of Riyadh city.

Keywords: behavior; dental problems; oral health problems; self-medication.

Congenital Anomalies Associated with Syndromic and Non-Syndromic Cleft Lip and Palate

A. I. Hadadi, D. Al Wohaibi, N. Almtrok, ***Nawaf Aljahdali***, O. AlMeshal, M. Badri

JPRAS Open, 2017 Dec;14:5-15.

Objective: To evaluate our institution's experience with cleft lip and palate patients and the associated syndromes and congenital anomalies.

Design: Retrospective cross-sectional hospital-based study.

Setting: King Abdul-Aziz Medical City, a major tertiary care center in Riyadh, Saudi Arabia.

Patients, participants: The study included all orofacial cleft (OC) cases treated at our institution between January 2008 and December 2014.

Main outcome measures: All subtypes of OC classifications with gender distribution, frequency of associated congenital anomalies, syndromes, and the sequelae of OC including otitis media and aspiration pneumonia.

Results: The study included 196 patients. All OC cases were typical. Median (interquartile range) age was 9 (3–24) months, and 109/196 (56%) were male. Syndromic OC accounted for 38/196 (19%). The most common OC subtype was cleft palate (CP) in 78/196 (40%), followed by cleft-lip and palate in 67/196 (34%), and cleft-lip in 51/196 (26%). Congenital anomalies were diagnosed in 41/196 (21%) patients with congenital heart anomaly 24/41(58.5%), which was the commonest. Robin sequence was the most commonly associated clinical entity, seen in 25/196 (13%). Other syndromes identified included popliteal pterygium, Stickler, Apert, Dandy-Walker, Blepharo-cheilo-dontic, and Turner syndromes. OC subtypes differed significantly by congenital anomalies (χ^2, $p < 0.0001$) and syndromes (χ^2 $p < 0.0001$). Otitis media was most common in the CP subtype, seen in 55/196 (54%).

Conclusions: Patients with OC are at increased risk of congenital malformations and syndromes. Routine screening for congenital heart anomalies should be considered and genetic counseling might be warranted in familial cases.

Keywords: Cleft lip and palate, Congenital anomalies, Syndromes, Congenital heart disease

Pigmented oral lesion

Gajendra Veeraraghavan, Santhosh Kumar S. Hiremath, Gaurav Sapra, Shhraddha Singh

International Journal of Oral Health Sciences, 2017 Jul;7(2):1014.

Abstract: In general dental practice, a dentist may come across various pigmented lesions in oral cavity. In most cases, the lesions are asymptomatic and benign in nature. However, rarely, a pigmented lesion can be a sign of malignancy. We report a case of a pigmented lesion in mandibular gingiva to highlight the importance of biopsy for early diagnosis and prolonged survival of patients.

Keywords: Malignant melanoma, melanocytes, oral malignant melanoma

Oral Kaposi Sarcoma in HIV-Seronegative Saudi patient: Literature Review and Case Report

Asmaa Faden, Manal AlSheddi, Mohammed AlKindi, ***Lama Alabdulaaly***

The Saudi Dental Journal, 2017 Jul; 29(3): 129-134.

Abstract: Kaposi Sarcoma (KS) is an intermediate neoplasm affecting the endothelial cells of mucous membranes and skin. It arises most commonly among HIV-infected individuals. We present an intra-oral KS in an 80-year-old Saudi male patient, who is HIV-seronegative, non-immunosuppressed, and with no history of organ transplantation. The patient was treated with fractionated radiation therapy, and had no recurrence in the 48 months of follow-up. The clinical disease, histologic features, and treatment modality used, as well as the relative literature are presented in this paper.

Keywords: HIV-seronegative; Kaposi sarcoma; Non-immunosuppressed; Pyogenic granuloma.

Substance Use Disorders. (Book Chapter)

Abdul Rahim Mohammad

In: Patton LL, Glick M, editors. The ADA practical guide to patients with medical conditions. 2nd Ed, Wiley-Blackwell; 2016, pp. 351-80.

Summary: Substance use disorders (SUDs) encompass substance abuse, substance dependence, and addiction disorders and can be measured on a continuum ranging from mild to severe. They are characterized by potential for addiction. In 2011, the American Society of Addiction Medicine (ASAM) defined addiction as follows: Addiction is a primary, chronic disease of brain reward, motivation, memory and related circuitry. Dysfunction in these circuits leads to characteristic biological, psychological, social and spiritual manifestations. This is reflected in an individual pathologically pursuing reward and/or relief by substance use and other behaviors. Addiction is characterized by: (1), the inability to consistently abstain; (2), impaired behavioral control; (3), cravings; (4), diminished recognition of significant problems, with one's behaviors and interpersonal relationships; (5), a dysfunctional emotional response. Like other chronic diseases, addiction often involves cycles of relapse and remission and is progressive. If the patient does not receive treatment or engagement in recovery activities, his addiction can result in disability or premature death.

Primary Sinus Carcinoma Masquerading as Destructive Periodontitis: Report of a Case

Hari Pillai, Anil Sukumaran, ***Ravindranath Rajendran***

Dentistry, 2014 Jan;4(8):1000251.

Abstract: Carcinomas of the maxillary sinus are uncommon and comprise 3% of all head and neck cancers, and 80% of all paranasal sinus cancers. Squamous cell carcinoma is the most common malignant tumor at this site, representing 60%–90% of the total cases. A case of occult carcinoma of the maxillary antrum with features of destructive periodontitis in a 48 year old female is presented. The case reported here remained undiagnosed due to failure of manifestation of associated signs and symptoms primarily overshadowed with those of tooth related pathoses. The need of clinical suspicion of malignancy arising from maxillary sinus should be taken into consideration whenever dealing with non-specific oral symptoms likes pathologic tooth mobility especially in the upper jaw. The case reported here failed to manifest salient clinical signs and symptoms of the tumor and areas of tumor involvement except perhaps of the jaw. The need for early screening and management protocols for effective control of the lesion cannot be overemphasized.

Keywords: Squamous cell carcinoma; Maxillary sinus; Neoplasms; Diagnosis; Periodontitis

Oral Submucous Fibrosis: Revised Hypotheses as to its Cause [Editorial]

Ravindranath Rajendran, Anil Sukumaran.

The Journal of Contemporary Dental Practice, 2013 Sep;14(5):i-ii.

No Abstract

Osteosarcoma of the Mandible Masquerading as a Dental Abscess: Report of a Case

Anil Sukumaran, Krishnan AP, ***Ravindranath Rajendran***

Case Reports in Dentistry. 2012;2012.635062:1-5.

Abstract: An aggressive and fatal case of osteosarcoma of the mandible in a 19-year-old female is reported. Six weeks after the clinical appearance of the swelling, the patient died. This paper is unique in that the age of occurrence and the biologic behavior of the tumor were not consistent with the reported literature. The case report is followed by a brief review of osteosarcoma of the jaw with a note on its clinical presentation, diverse radiologic appearance, varied histopathologic picture, and prognosis.

Oral
Pathology

2.4 ORAL PATHOLOGY

Oral Hairy Leukoplakia: A Series of 45 Cases in Immunocompetent Patients.

Asma Almazyad, Lama Alabdulaaly, Vikki Noonan, Sook-Bin Woo.

Oral Surgery, Oral Medicine, Oral Pathology and Oral Radiology. Online published 29 Mar 2021, ahead to print.

Objective. Oral hairy leukoplakia (OHL) is a benign Epstein-Barr virus infection typically presenting as a white lesion on the lateral border of the tongue. Historically, OHL was described in patients who are severely immunocompromised, such as those with HIV/AIDS and organ transplant patients. OHL is increasingly seen in patients who are not severely immunocompromised. This study reviews 45 cases of OHL in a single institution and characterizes the clinical features of these relatively immunocompetent patients.

Study Design. Retrospective study.

Results. There were 45 cases with 23 male patients (51.1%) and a median age of 64 (range, 24-100 years). The lateral/ventral tongue was the affected site in 41 cases (91.1%), and 5 cases presented bilaterally. A review of the medical history and medications showed the most common conditions were hypertension (53.3%), hyperlipidemia (42.2%), and chronic respiratory conditions (33.3%); 8 patients (17.8%) had diabetes mellitus, and 1 had rheumatoid arthritis. Eleven cases (24.4%) reported no underlying medical conditions or history of medications. The most frequently reported medications included antihypertensive drugs (21.0%), steroid inhalers (14.6%), and cholesterol-lowering drugs (11.0%).

Conclusions. OHL is not exclusively seen in profoundly immunocompromised patients. Localized immunosuppression (from steroid inhalers) and immunosenescence (aging) are possible contributing factors.

Cytokeratin 19 Immunostain Reduces Variability in Grading Epithelial Dysplasia of the Non-Keratinized Upper Aerodigestive Tract Mucosa

Rima A Safadi, Abdulaziz AlRomaizan, Rana S Alshagroud, Darshan D. Divakar, Saeed Alshieban

Head Neck Pathology, 2020 Mar;14(1):183-191.

Abstract: Epithelial dysplasia (ED) grading systems are criticized for low reliability. The effects of diagnostic tests or stains on reducing examiner variability in grading ED of the upper aerodigestive tract have not been investigated. The study aim was to examine the effectiveness of cytokeratin 19 (K19) immunostain on enhancing inter and intraexaminer reliability of ED grading and to reiterate the relation of K19 positivity with epithelial keratinization. The study sample consisted of 122 paraffin blocks that fulfilled the inclusion criteria. Each paraffin block had three sections cut: one immunostained for K19 and two for hematoxylin and eosin stain (H&E). Each examiner graded the study sample in six rounds; three using H&E stain only and three using paired K19-H&E stains. The study examiners were three American-Board certified practicing oral pathologists. The results were analyzed using Krippendorff's alpha, ROC curve, Chi square test and binary logistic regression. Upon the use of paired K19-H&E stains the results showed that the intraexaminer reliability coefficients of grading were improved from 0.70, 0.69, 0.78 to 0.73, 0.88, 0.91 for examiners 1, 2, and 3 respectively. Reliability coefficients for inter-examiners improved from 0.55 to 0.73 (Krippendorff alpha). The accuracy of identifying the diseased cases (high-grade dysplasia)

increased from 0.82 to 0.94 (ROC curve). Binary logistic regression revealed that K19 positivity is negatively associated with hyperkeratinization of surface epithelium (P = 0.001). To conclude, for grading non-keratinized epithelial dysplastic lesions of the upper aerodigestive tract, paired K19-H&E stains proved to reduce inter and intra-examiner variability by highlighting the extension of dysplastic epithelial cells within epithelial thickness, thus identifying the involved epithelial third and assigning a more reliable and better reproducible grade.

Keywords: Adjunctive, Dysplasia, Grade, K19, Reliability, Variability

Autosomal dominant mutation of MSX1 gene causing tooth and nail syndrome

Mohammed Najmuddin, Safeena Abdul Khader Saheb, Abdulrahman Nahi Alharbi, Fahad Mohammed Alsobil, Chitra Jhugroo, Aftab Ahmed Khan, Darshan Devang Divakar, Sachin Naik, ***Sanjeev Balappa Khanagar***.

Pan African Medical Journal, 2020 Jul;36(229):1-6.

Abstract: Tooth and Nail Syndrome or Nail Dysplasias with Hypodontiaor Witkop´s Syndrome is an autosomal dominant condition present at birth and improves by age. An early diagnosis is essential to avoid future functional, aesthetic, and psychological problems. Here we report two classic cases with brief clinical, radiological and genetic investigation along with a brief review of literature.

Occurrence of vancomycin MIC creep in methicillin resistant isolates in Saudi Arabia

Sameerah Aljohani, Laila Layqah, Emad Masuadi, Bassam Al Alwan, ***Waleed Baharoon***, Jawaher Gramish, Salim Baharoon

Journal of Infection and Public Health, 2020 Oct;13(10):1576-1579.

Background: “MIC creep” is a phenomenon that describes an increase of an organism MICs over time and have been reported from different parts of the world. High MIC in MRSA has been theoretically liked to treatment failure and may be a precursor to hVISA and VISA. This study was conducted to assess presence of vancomycin minimum inhibitory concentration (MIC) creeps among clinical isolates of methicillin-resistant *Staphylococcus aureus* (MRSA) in Saudi Arabia.

Methods: Minimum inhibitory concentration (MIC) of vancomycin by E test of all MRSA isolates of from 2013 to 2018 were reviewed.

Results: Of the 736 isolates evaluated, no isolates with MIC above 2 were found. Majority of MRSA isolates were susceptible to vancomycin with MIC less than 1. There was a significant increase in both Arithmetic and geometric mean MIC for vancomycin during the first three years which progressively declined in the next three years.

Conclusions: Although most of MRSA isolated remained very susceptible to vancomycin there was evidence of dynamic vancomycin MIC creep over time.

Keywords: VANCOMYCIN, MIC creep, MRSA

Reexploring picrosirius red: A review

Pillai Arun Gopinathan, Ganganna Kokila, ***Salman Siddeeqh***, Roopan Prakash, Pradeep L.

Indian Journal of Pathology and Oncology, 2020 Jun;7(2):196-203.

Abstract: Picrosirius red stain has been increasingly used for collagen studies in dental and medical research. Sirius red is an acidic dye which binds specifically to collagen and distinguishes type I and type III collagen fibres. This review depicts earlier uses of picric acid, preparation of the picrosirus red stain, mechanism of action, hazards and safety protocols of handling picric acid in laboratory.

Benign Alveolar Ridge Keratosis: Clinical and Histopathologic Analysis of 167 Cases

Asma Almazyad, Chia-Cheng Li, Sook-Bin Woo.

Head and Neck Pathology, 2020 Dec;14(4):915-922.

Abstract: Benign alveolar ridge keratosis (BARK), the intraoral counterpart of cutaneous lichen simplex chronicus, is a reactive hyperkeratosis caused by trauma or friction that presents as a poorly demarcated white papule or plaque on the keratinized mucosa of the retromolar pad or alveolar ridge mucosa (often edentulous). This is a clinical and histopathologic analysis of BARK including evaluation of p53 expression in selected cases. One hundred and sixty-seven cases of BARK were identified from 2016 to 2017 and 112 (67.1%) occurred in males with a median age of 56 years (range 15–86). The retromolar pad was affected in 107 (64.1%) cases and the edentulous alveolar mucosa in 60 (35.9%) cases, with 17.4% of the cases presenting bilaterally. BARK showed hyperkeratosis often with wedge-shaped hypergranulosis and occasional focal parakeratosis. The epithelium exhibited acanthosis and surface corrugation with tapered rete ridges often interconnected at the tips. The study for p53 performed in 12 cases showed less than 25% nuclear positivity. BARK is a distinct benign clinicopathologic entity caused by friction, which should be clearly distinguished from true leukoplakia, a potentially malignant disorder.

Keywords: Frictional keratosis, Leukoplakia, Oral potentially malignant disorder, Epithelial dysplasia, p53, Cutaneous, lichen simplex chronicus

Clinical and histopathologic prognostic implications of the expression of cytokeratins 8, 10, 13, 14, 16, 18 and 19 in oral and oropharyngeal squamous cell carcinoma

Rima A. Safadi, Niveen I. Abdullah, Rolla F. Alaaraj, Dima H. Bader, Darshan D. Divakar, ***Abed A. Hamasha***, Maher A. Sughayer

Archives of Oral Biology, 2019 Mar; 99:1-8.

Objectives: To identify cytokeratins (CK) of significant correlations with clinical and histopathologic prognostic parameters in oral and oropharyngeal squamous cell carcinoma (SCC).

Design: The sample consisted of 100 cases retrieved from the archives of the Pathology Department/ King Hussein Cancer Center/Amman/ Jordan. Recorded data included: age, gender, location, grade, depth of invasion, the presence of epithelial dysplasia, tumor size, lymph node metastasis, number of positive lymph nodes, distant metastases, clinical stage, local recurrence, treatment modalities and 5-year survival rate. Immunohistochemical staining of 7 cytokeratins: 8, 10, 13, 14, 16, 18, and 19 was performed using standard protocols. Stained sections were digitized and analyzed using ImageJ-color deconvolution

to identify the percentage of cytokeratin-positive area (score). Statistical tests used were: student t-test, analysis of variance, bivariate analysis and logistic regression.

Results: Lower CK8,18, 19 scores correlated with lower 5-year survival rate. Higher CK19 and lower CK 10, 14, 16 scores were associated with distant metastasis. Increased CK8, 18, 19 scores correlated with higher stage and with higher depth of invasion. Increased CK18 scores correlated with increased local recurrence. Higher CK10, 13, 16 scores correlated with well-differentiated grade. Higher CK19 and lower CK16 scores were associated with adjacent epithelial dysplasia. Regression analysis showed that better 5-year survival rate was significantly correlated with increased CK16, decreased CK18 and 19 scores.

Conclusion: Expression scores of a panel of cytokeratin are potential prognostic indicators for 5-year survival and correlates with other prognostic parameters.

Keywords: Cytokeratin; Immunohistochemistry; Oral; Prognosis; SCC; Survival.

Mutations in FGFR3 gene associated with maxillary retrognathism

Ravi M. Subrahmanya, ***Sreenivas V. Prasad,*** Rajendra B. Prasad, Subraya Mogra, Veena Shetty, Vamana Rao

Indian Journal of Dental Research, 2019 Apr;30 (2):185-190.

Context: Understanding the role of fibroblast growth factor receptor (FGFR) in the regulation of bone development and disease will ultimately lead to better prevention and treatment of related bone deformities and disorders.

Aims: To evaluate the role of gene FGFR3 in individuals with retrognathic maxilla by polymerase chain reaction (PCR) technique at molecular level and evaluate the significance of the same.

Settings and design: Hospital based fundamental research involving individuals having maxillary retrognathism.

Methodology: A total of 62 individuals (30M and32F) who were willing to take part in the study were selected from cephalometric measurements of N I A and the length PNS to ANS. The institution based basic genetic research study involved collection of fresh blood samples, DNA extraction, PCR analysis, and amplification using the specifically designed forward and reverse primers for targeting the commonly occurring mutations in FGFR3 gene. Further the products were sequenced to evaluate the presence of any novel mutations.

Results: The targeted single-nucleotide polymorphisms, at position 1138 in exon 10 of the FGFR3 gene were not identified in the analyzed blood samples. The detailed sequencing of full gene revealed the presence of 2 novel mutations, Exon 3: A213G and Exon 3: A223A/G in one individual.

Conclusions: The present study indicated 2 novel mutations in gene FGFR3 in individual with maxillary retrognathism. The genetic-environmental interactions might have played a significant role in the expression of retrognathic maxilla.

Keywords: Gene FGFR3; mutations; retrognathic maxilla.

Molecular Screening of VAX1 Gene Polymorphisms Uncovered the Genetic Heterogeneity of Nonsyndromic Orofacial Cleft Among Saudi Arabian Patients

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Genetic Testing and Molecular Biomarkers, 2019 Jan;23(1):45-50.

Objective: Nonsyndromic orofacial cleft (NSOFC) including cleft lip with or without cleft palate (CL±P) and cleft palate (CP) are multifactorial developmental disorders with both genetic and environmental etiological factors. In this study we investigated the association between CL±P and CP, and two polymorphisms previously determined using genome-wide association studies, as well as the association between consanguinity and CL±P and CP.

Methods: DNA was extracted from saliva specimens from 171 triads consisting of affected individuals and their parents, as well as 189 control triads (matched for age, gender, and location) that were recruited from 11 referral hospitals in Saudi Arabia. Two polymorphisms, rs4752028 and rs7078160, located in the VAX1 gene were genotyped using real-time polymerase chain reaction. A transmission disequilibrium test was carried out using the Family-Based Association Test and PLINK (genetic tool-set) to measure the parent-of-origin effect.

Results: Significant differences were found between affected individuals and the control group. In the case of the rs4752028 risk allele in cleft, the phenotypes were: CL±P (fathers: odds ratio [OR] 2.16 [95% CI 1.38-3.4]; mothers: OR 2.39 [95% CI 1.53-3.71]; and infants: OR 2.77 [95% CI 1.77-4.34]) and CP (fathers: OR 2.24 [95% CI 1.15-4.36] and infants: OR 2.43 [95% CI 1.25-4.7]). For CL±P and the rs7078160 risk allele, the phenotypes were: (fathers: OR 1.7 [95% CI 1.05-2.86]; mothers: OR 2.43 [95% CI 1.49-3.97]; and infants: OR 2.34 [95% CI 1.44-3.81]). In terms of consanguinity, we found significant association between consanguinity and the rs4752028 polymorphism minor allele among CL±P compared with controls ($p = 0.001$).

Conclusion: This is the first study to find a relationship between these two loci on 10q25 (rs4752028 and rs7078160) and NSOFC in a population with high levels of consanguinity.

Keywords: VAX1; cleft lip; cleft palate; consanguinity; etiology.

Optimizing Laser Capture Microdissection Protocol for Isolating Zone-Specific Cell Populations from Mandibular Condylar Cartilage

Aisha M. Basudan, Yanqi Yang

International Journal of Dentistry, 2019 Nov; 5427326:1-13.

Abstract: Mandibular condylar cartilage (MCC) is a multizonal heterogeneous fibrocartilage consisting of fibrous (FZ), proliferative (PZ), mature (MZ), and hypertrophic (HZ) zones. Gross sampling of the whole tissue may conceal some important information and compromise the validity of the molecular analysis. Laser capture microdissection (LCM) technology allows isolating zonal (homogenous) cell populations and consequently generating more accurate molecular and genetic data, but the challenges during tissue preparation and microdissection procedures are to obtain acceptable tissue section morphology that allows histological identification of the desirable cell type and to minimize RNA degradation. Therefore, our aim is to optimize an LCM protocol for isolating four homogenous zone-specific cell populations from their respective MCC zones while preserving the quality of RNA recovered. MCC and FCC (femoral condylar cartilage) specimens were harvested from 5-week-old Sprague–Dawley male rats. Formalin-fixed and frozen unfixed tissue sections were prepared and compared histologically. Additional specimens were microdissected to prepare LCM samples from FCC and each MCC zone individually. Then, to evaluate LCM-RNA integrity, 3′/m ratios of glyceraldehyde 3-phosphate dehydrogenase (GAPDH) and beta-actin

(*β*-Actin) using quantitative reverse transcription-polymerase chain reaction (qRT-PCR) were calculated. Both fixed and unfixed tissue sections allowed reliable identification of MCC zones. The improved morphology of the frozen sections of our protocol has extended the range of cell types to be isolated. Under the empirically set LCM parameters, four homogeneous cell populations were efficiently isolated from their respective zones. The 3′/m ratio means of GAPDH and *β*-Actin ranged between 1.11–1.56 and 1.41–2.12, respectively. These values are in line with the reported quality control requirements. The present study shows that the optimized LCM protocol could allow isolation of four homogenous zone-specific cell populations from MCC, meanwhile preserving RNA integrity to meet the high quality requirements for subsequent molecular analyses. Thereby, accurate molecular and genetic data could be generated.

Solitary Bone Cyst: Traumatic Cyst, Hemorrhagic Cyst, Extravasation Cyst, Unicameral Bone Cyst, Simple Bone Cyst, and Idiopathic Bone Cavity

Raveendranath Rajendran, ***Hari Pillai***, Sukumaran Anil

Oral & Maxillofacial Pathology Journal, 2016 Jul;7(2):720-725.

Introduction: Solitary bone cyst (SBC) of the maxillofacial region is an uncommon lesion. In spite of this, it still remains to be very frequent in the dental literature.

Purpose: To review the published literature on SBC for insight on its etiopathogenesis and cytogenetic factors with a brief review on the main characteristics of this lesion.

Materials and methods: The data were analyzed from electronic database searches of published literature from PubMed.

Results: Following the literature search for the topic, 50 papers were considered eligible for the inclusion into the review. All the literature review and studies were analyzed, coined, and summarized. Based on this available literature, SBC appears to be a very rare entity with typical clinical and radiographic details. Surgical removal being the treatment of choice provides a satisfactory diagnosis.

Conclusion: Based on the evidence of available literature, SBC is a very rare lesion that can affect all skeletal bones, a majority of which occur in the long bones with < 10% seen involving the jaw bones. It is mainly diagnosed in young patients during the second decade of life.

Keywords: Extravasation cyst, Hemorrhagic cyst, Idiopathic bone, cavity, Simple bone cyst, Traumatic cyst, Unicameral bone cyst.

Association of Poly (ADP-Ribose) Polymerase 1 Variants with Oral Squamous Cell Carcinoma Susceptibility in a South Indian Population

Sukumaran Anil, Gopikrishnan PB, Ashik Bin Basheer, ***Vidyullatha Balagatte Gopalakrishna***, Yahya A. Alogaibi, Elna P. Chalisserry, Fawad Javed, M H N Dalati, Sajith Vellappally, Mohamed Ibrahim Hashem, Darshan Devang Divakar

Asian Pacific Journal of Cancer Prevention, 2016 Aug;17(8):4107-4111.

Background: Oral cancers account for approximately 2% of all cancers diagnosed each year; however, the vast majority (80%) of the affected individuals are smokers whose risk of developing a lesion is five to nine times greater than that of non-smokers. Tobacco smoke contains numerous carcinogens that cause

DNA damage, including oxidative lesions that are removed effectively by the base-excision repair (BER) pathway, in which poly (ADP-ribose) polymerase 1 (PARP-1), plays key roles. Genetic variations in the genes encoding DNA repair enzymes may alter their functions. Several studies reported mixed effects on the association between PARP-1 variants and the risk of cancer development. Till now no reported studies have investigated the association between PARP-1 variants and oral squamous cell carcinoma (OSCC) risk in an Indian population.

Materials and methods: In the present case control study 100 OSCC patients and 100 matched controls were genotyped using PARP1 single nucleotide peptides (SNP's) rs1136410 and rs3219090 using TaqMan assays.

Results: The results indicated significantly higher risk with PARP1 rs1136410 minor allele "C" (OR=1.909; p=0.02942; CI, 1.060- 3.439). SNP rs1136410 also showed significantly increased risk in patients with smoking habit at C/C genotype and at minor allele C.

Conclusions: The PAPR-1 Ala762Val polymorphism may play a role in progression of OSCC. Larger studies with a greater number of samples are needed to verify these findings.

Keywords: Oral squamous cell carcinoma - poly (ADP-Ribose) polymerase 1 - risk factor

Effectiveness of Agents Like Platelet-rich Plasma, Oxidized Regenerated Cellulose and Microfibrillar Collagen in Hard-tissue Healing: Validation of their Comparative Effectiveness

Khalid Al-Fouzan, Hari Pillai, Anil Sukumaran, ***Raveendranath Rajendran***

Oral & Maxillofacial Pathology Journal, 2015 Jul-Dec; 6(2):609-611.

Abstract: Autologous platelet-rich plasma (PRP) can be a valid agent that is effective in inducing and accelerating bone healing for the treatment of periodontal defects and also to accelerate alveolar bone regeneration. Early healing appeared to be impaired by the presence of microfibrillar collagen (MFC) and impeded by the presence of oxidized regenerated cellulose (ORC). In contrast, alkylene oxide copolymer (AOC) did not inhibit bone healing and suggest that AOC may be a better bone hemostatic material for procedures where bony fusion is critical and immediate hemostasis required.

Keywords: Platelet-rich plasma, Microfibrillar collagen, Oxidized regenerated cellulose, Alkylene oxide copolymer, tissue healing.

Paradental Cyst (Inflammatory Collateral Cyst): A True Clinicopathologic Entity

Raveendranath Rajendran, Hari Pillai, Khalid Al-Fouzan, Anil Sukumaran

Oral & Maxillofacial Pathology Journal, 2015 Jul; 6(2):621-624.

Abstract: Paradental cyst is an inflammatory odontogenic cyst arising in association with partially erupted third molars affected with pericoronitis. The common location is on the buccal aspect of the molar teeth. Radiographically, the characteristic presentation is a well-defined radiolucency superimposed on the roots. Histologically, cysts were lined with nonkeratinized epithelium. The various concepts underlining the origin/pathogenesis of this rare entity is discussed and critically appraised.

Keywords: Cyst, Paradental cyst, pericoronitis.

Shafer's Textbook of Oral Pathology, 6th Ed. (Book)

Ravindranath Rajendran, B. Sivapathasundharam.

Elsevier India, New Delhi, (ISBN: 978-81-312-3097-8), 2012, 1001p.

Preface: The periodic and timely revisions of Shafer's Textbook of Oral Pathology have brought out a treatise, well conceived and written with the aim of updating the student all necessary nuances of the specialty. The scope of the present edition is an extension of this goal aimed at understanding the disease processes at a more fundamental level, the impetus being those in the maxillofacial region. While the subject appears more of loco-regional nature, as the text unfolds, its wider ramifications become more apparent and the disease entities described here appear wider in scope and nature. As in the past, this edition has also undergone an extensive revision and new topics have been included. A well thought out decision of incorporating 'cutting edge' technologies of relevance such as molecular markers and disease profiling, continues to be incorporated in the text with the aim of updating the subject and making it more contemporary. Scattered throughout the text one finds highlighted 'boxes' which stand out, yet merge imperceptibly with the rest, denoting advanced information perhaps beyond the ambit of the undergraduate curriculum. In this way, the text has been user friendly, though discriminatory of the scope and choice of its contents. We believe this approach is sensible and will be well taken by the readership. This textbook represents a treasury of information based for the most part, on the publications of our contemporaries and predecessors. In order to present the material in an informal manner, continuous referencing to these sources have been discarded. However, the reader will find a list of suggested references of wider scope at the end of each chapter. This edition is peculiar in having new pieces of four-color art schematics, flowcharts and diagrams primarily aimed at comprehension of its contents and to facilitate reasoning of concepts such as the molecular basis of cancer. A change which is far reaching and marked is the hard copy format of the text which intends to minimize structural fatigue and maximize ease of usage. Finally, as was true of the fifth and sixth editions, all of our associations with the publisher, Elsevier India were pleasant and helpful. We want to thank the editorial staff of Elsevier India for their skilled and friendly assistance in helping us publish this project to completion successfully. Deficiencies and shortcomings are rather inevitable in an effort of this magnitude and for which we shall be solely responsible. This textbook is dedicated to our contemporaries and predecessors who have made this effort a reality.

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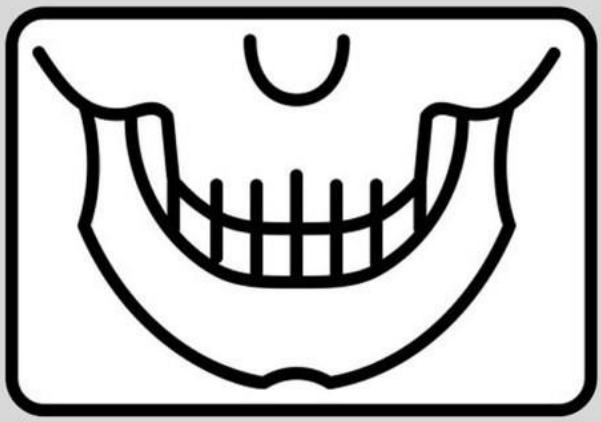

2.5 ORAL AND MAXILLOFACIAL RADIOLOGY

Cone beam computed tomography for evaluation of mandibular lingual canal in an Egyptian subpopulation

Rabab Amin Elmasry, Mona Mahmoud Abu El-Fotouh, Shaimaa Mohamed Abu el Sadat, ***Wael Aboelmaaty.***

Egyptian Journal of Radiological and Nuclear Medicine 2021 May;52, Article No.125,

Background: A sample of three hundred cone beam computed tomography (CBCT) scans was evaluated. Median lingual canals (MLC) were identified and classified according to their anatomical location. Evaluation of the canal diameter, length, thickness of the buccal cortical plate, and the remaining bone above and below the canal was performed. The results were assessed twice with 2 weeks interval and statistically analyzed. The study was designed to evaluate MLC in an Egyptian subpopulation by the use of CBCT.

Results: Most of the scans presented with one MLC, with a maximum number of four canals, the mean diameter was 1.68± 1.27 mm, with a statistically significant difference in the length from the canal opening to the alveolar crest between females and males.

Conclusions: As the study detected a high prevalence of the MLC with a vast majority of the canals supra-spinosum, a vigilant examination is required using CBCT to avoid subsequent bleeding and airway obstruction.

Can 3D cone beam computed tomographic measurements replacing their real counterpart: A comparative study.

Iman Dakhli, ***Omniya Abu El-Dahab.***

International Journal of Dental Sciences, 2021 Mar; 3(1):20.25.

Aim: To verify whether the measurements obtained from three-dimensional cone beam computed tomographic (CBCT) imaging could replace those obtained from their real counterpart.

Methodology: Fifteen human dry mandibles were enrolled in the current study. Multiplanar reformatting 2dimentional(2D) and generated 3dimentional(3D) images were used to perform the linear measurements between the markers then 2D and 3D measurements were compared with the physical measurements taken with an electronic digital caliper.

Results: 2dimentional measurements had the least error which is highly significantly lower than 3dimentional measurements.

Conclusion: Linear measurements taken on multiplanar 2dimentional CBCT images are reliable and accurate for clinical diagnosis and treatment planning. Linear measurements on 3dimentional rendering images are reliable but with less accuracy than the 2 dimensional images.

Keywords: 2D, 3D images, CBCT, linear measurements

Morphometric Analysis of the Mandibular Canal, Anterior Loop, and Mental Foramen: A Cone-Beam Computed Tomography Evaluation.

Altayeb Abdalla Ahmed, Rawia Mohamed Ahmed, ***Ahmed Jamleh***, Gianrico Spagnuolo.

International Journal of Environmental Research and Public Health, 2021 Mar 24;18(7), 3365.

Abstract: This study investigated the cone-beam computed tomography (CBCT)-based features of the mandibular canal, mental foramen, anterior loop, and accessory mental foramina with respect to age and sex. A total of 306 CBCT mandibular images were included in this retrospective study to measure the mandibular canal location and extension, the mental foramen position, the presence of the anterior loop, and the accessory mental foramina. The measurements were obtained in sagittal, coronal, and axial views. Descriptive statistics are presented. Sex-related differences, correlations, and comparisons were calculated using SPSS at 5% significance level. The mandibular canal was located more coronal and medial in male patients. The majority of cases had the mental foramen located just apical to the mandibular second premolar with a mean height of 2.94 mm and a mean length of 3.28 mm. Age affected the size of the mental foramen. The mental canal in all cases tended to show a coronal direction. Mesial extension of the anterior loop was found in 66.01% of the images while accessory mental foramina were detected in 2.6%. The complexity of the mandibular canal, mental foramen, anterior loop, and accessory mental foramina among Sudanese patients with respect to age and sex was confirmed.

Sexual differentiation based on mandibular parameters utilizing cone beam computed tomography of a sample of Egyptian population

Iman Dakhli, ***Omniya Abu El-Dahab.***

International Archives of Integrated Medicine, 2020 May;7(5): 24-31.

Aim: To assess sexual identification in forensic context over a sample of Egyptian population using osteometric mandibular measurements performed on cone beam computed tomography (CBCT) images.

Materials and methods: The present study comprised of 102 living non-pathological Egyptian CBCT records of mandibles (204 mandibular rami and angles bilaterally) 52 males and 50 females aged 20-70 years. All the patients were scanned with CBCT for various purposes. Six measurements were finished in the jaws on CBCT images: gonial angle (GA), ramus length (RL), minimum ramus breadth (MRBr), gonionegnathion length (GGL), bicondylar breadth (BicBr) and bigonial breadth.

Results: Males had statistically significantly higher mean ramus length, minimum ramus breadth, Bigonial distance, Bicondylar distance and mandibular base length than females. Males showed statistically significantly lower mean ramus angle than females. The significant predictors for gender were: Bicondylar distance, mandibular base length and ramus length.

Conclusion: This study on mandibles of a sample of Egyptian population clearly indicated that the Bicondylar distance, mandibular base length and ramus length have satisfactory potential for determination of sex.

Keywords: Forensic, CBCT, Mandible, Sex identification.

CBCT analysis of the prevalence and descriptive characteristics of RMF and RMC in a sample of Egyptian Population.

Omniya Abu El-Dahab

Bioscience Research, 2020 Jun;17(2): 1475-1483.

Abstract: The current work was perfumed with objectives 1) to carry out analysis for the prevalence and gender predilection of RMF(retromolar foramen) and RMC (retromolar canal) in a sample of adult Egyptian population using CBCT, 2) To determine the location and adjacency of the RMF to the lower 2nd molars,

3) To assess the height and suggest for morphological classification of the RMC.CBCT scans of one hundred and fifty two adult participants (60 male and 92 female) showing the entire retromolar region of the mandible bilaterally were analyzed carefully to detect the existence of retromolar foramens and morphology of the retromolar canals. The distance between the RMF and the CEJ of the second molar and the length of the RMC were measured. The prevalence of RMF in a sample of Egyptian population was (3.9%). All the foramina were detected unilaterally with no statistical significance between right and left sides. The curved course with horizontal branch was more common (Type VIII, B2). Although the prevalence of RMF and RMC in our population is low, however, their assessment is highly recommended to avoid surgical and anesthetic complications.

Keywords: CBCT, RMF, RMC

A Digital Cephalometric Study on The Morphometric Evaluation of Soft Palate in Oral Submucous Fibrosis

Manaswita Tripathy, Jayaprasad Anekar, Raj AC, Sandeepa N. C., Deepika Nappalli, Priya Lokanath, Abdulrahman Nahi Alharbi, Fahad Mohammed A. Alsobil, Darshan Devang Divakar, Aftab Ahmed Khan, Chitra Jhugroo, ***Sanjeev Balappa Khanagar***, Sachin Naik.

Asian Pacific Journal of Cancer Prevention, 2020 July;21(7):2169-2176.

Objective: Oral submucous fibrosis (OSMF) is a chronic precancerous condition affecting the oral cavity, which is progressive and characterised by burning sensation and fibrotic change leading to restriction of mouth opening. This study evaluated the morphology of soft palate in different stages of OSMF patients using digital lateral cephalogram and compare it with healthy individuals.

Methods: The study included 60 subjects, who were grouped as 30 OSMF and 30 healthy subjects from the same geographic population. Digital lateral cephalograms were taken with Planmeca Proline XC (Oy, Helsinki, Finland). Soft palate morphology was evaluated using Lateral Cephalogram, and the results were analysed statistically.

Results: Leaf-shaped (Type 1) soft palate was commonly seen in the control group and stage I and II OSMF. Stage III OSMF patients presented with a butt-shaped (Type 3) soft palate. As the disease progressed, there was a conversion of Type 1 variety of soft palate to Type 3 variety. There was a gradual reduction in the length of the soft palate in the anteroposterior direction in OSMF patients compared to the control group.

Conclusion: Early cephalometric diagnosis of soft palate changes may play a pivotal role in the overall management of OSMF.

Keywords: Precancerous lesion, prevention, diagnosis

Reliability Assessment of the Clinical and Radiographic Diagnosis of Furcation Involvement

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The Open Dentistry Journal, 2020 Aug; 14, 403-407.

Aim: 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.

Keywords: Furcation involvement, Radiographic furcation, Alveolar bone loss, Periodontitis, Furcation defects, Dental radiographs.

Effectiveness of mouthrinses in prevention and treatment of radiation induced mucositis: A systematic review

Varsha Manoharan, Nusrath Fareed, Hemant Battur, ***Sanjeev Khanagar***, Jaseela Praveena

Journal of Cancer Research and Therapeutics, 2020 Dec;16(8) Suppl-1:1-10.

Abstract: Mucositis is a frequent, severe consequence of radiation therapy among patients undergoing radiotherapy for the head-and-neck cancer, often requiring hospitalization and even breaks or discontinuity in treatment. Mouth rinsing with various agents has demonstrated effectiveness in the prevention and treatment of radiation-induced mucositis (OM), but evidence for the same is lacking. This systematic review is therefore conducted with the aim of assessing the evidence for the effectiveness of mouthrinses in prevention and treatment of OM. Joanna Briggs Institute guidelines were followed to conduct this review. Six databases were searched and a total of 25 randomized clinical trials published over a period of the past 31 years were included for qualitative synthesis. Analysis of 25 studies revealed that 1299 participants, aged 46-69 years were assigned to the test groups and control groups. A total of 16 different formulations were studied among patients over a duration of 6 days to 1 year in varying dosages. The overall preventive fraction ranged from 1.9% to 77.8% for a reduction in clinical grades of mucositis, 7.6%-83.3% for a reduction in pain and 20%-50% for a reduction in bacterial counts. Adverse effects such as mouth burning, altered taste, sore throat, have been reported, especially with chlorhexidine and benzydamine hydrochloride. Evidence for the included studies is IC and ID. Studies using herbal based products and tissue regenerating agents revealed comparatively better effectiveness with lesser side effects. However, the number of studies to support such a claim is very limited.

Keywords: Head-and-neck cancer; mouthrinses; palliative care; radiation mucositis.

CBCT Analysis of Alveolar Bone Dimensions in Mandibular Posterior Teeth: A Preliminary Study

Cristalle Soman, Alanoud Almuhrij, Alghusen, Faizal Abdulrahman Alsubaie, ***Manal Aljamal,*** Rasha Alrasheed.

Indian Journal of Applied Research, 2019 Oct; 9(10):1-3.

Objectives: Extraction of mandibular posterior teeth followed by immediate implant placement is considered as an optimal technique of immediate prosthetic rehabilitation. The analysis of alveolar bone dimensions with Cone Beam Computerized Tomography prior to implant placement is a prime determinant in treatment planning. Hence this preliminary study was conducted to analyze the alveolar bone dimensions in dentate mandibular posterior teeth to evaluate the available bone which can be utilized for immediate implant placements.

Materials and Methods: Retrospective data of 200 cases of full volume CBCT was procured from Riyadh Elm University (REU) database and reviewed for eligibility. A total of 10 cases were included in the study. Scans were assessed for thickness of buccal and lingual walls at 4mm below the CEJ (MP1) and at midroot level (MP2). Alveolar width was assessed at most coronal point on alveolar bone (BW1) and at superior border of mandibular canal (BW2). The height was be calculated by measuring the vertical distance between BW1 and BW2. Data was tabulated and statistically analyzed using unpaired t-test.

Results: The results of our study indicates that dimensions of buccal and lingual bone walls of all teeth at MP1 and MP2 in PM1, PM2 and M1 were statistically significant. Also only the 1st premolar (PM1) showed statistical significance with regard to dimensions at BW1 and BW2.

Conclusion: The present study highlights the need for further studies with larger samples which can impact the immediate implant success rates in mandibular posterior teeth.

Keywords: Alveolar bone thickness; Immediate implant; Immediate prosthetic rehabilitation; Fresh Extraction; Mandibular bone dimensions; Implant planning.

Mandibular Morphological Variations in Partially Edentulous Adult Patients: An Orthopantomographic Study

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International Journal of Medical Research & Health Sciences, 2019 Nov;8(11): 67-74.

Objectives: This study was aimed to measure and evaluate the morphological changes of the mandible, related to age and gender in partially edentulous and completely dentate subjects using panoramic radiographs.

Methods: This study included a sample of 150 partially edentulous patients and 150 completely dentate patients enrolled in the College of Dentistry, King Saud Bin Abdulaziz University for Health Sciences between January 2015 and December 2018. Five mandibular morphological and anatomical parameters were measured using a Romexis software including; Condylar height. Gonial Angle, Ramus height, Antegonial notch depth and Ramal notch depth.

Results: There was a significant difference (p=0.00) seen in the mean values of GA when comparing the partially edentulous (130.01 ± 7.79°) and completely dentate group (126.95 ± 6.64°). The mean values of

GA were significantly larger among the younger age group (20-40) in both partially edentulous patients (131.58 ± 8.27°) and completely dentate group (127.17 ± 6.9°) ($p<0.05$).

Conclusion: There was no relationship between the changes in the morphological measurements related to age and gender except for GA where younger subjects have higher GA values. Also, the mean values of GA were significantly higher in the partially edentulous group compared to completely dentate.

Keywords: Mandible morphology, Partiality edentulous, Gonial angle, Condyle, Gonial

Impact of Routine Open-Mouth Osseous Temporomandibular Joint Tomography on Diagnosis and Therapeutic Options

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Oral Surgery, Oral Medicine, Oral Pathology and Oral Radiology, 2017 Apr;123(4):508-514.

Objectives: The aim of this study was to evaluate the impact of routine open mouth osseous temporomandibular joint (TMJ) tomography on diagnosis and treatment planning of TMJ conditions. Investigating the need for such images is important to justify the additional radiation exposure imparted by such procedures.

Study design: The records of patients who underwent closed- and open-mouth osseous TMJ tomography (planar film tomography up to the beginning of 2006; cone beam computed tomography from 2006 onward) were reviewed. Three examiners formulated a diagnosis and treatment plan based on the history, clinical findings, and tomography interpretation reports of closed-mouth images. Then they reviewed the interpretations of the open-mouth images and recorded whether they would change their original diagnosis and/or treatment plan on the basis of the findings. Descriptive analysis of the results was performed.

Results: The impact of routine open-mouth imaging on diagnosis and treatment planning was variable among the examiners. Examiners 1, 2, and 3 had a change in diagnosis in 7%, 5%, and 3% of cases, respectively, and a change in treatment plan in 1%, 1%, and 8%, respectively.

Conclusions: Routine open-mouth osseous TMJ tomography had a minimal impact on diagnosis and treatment planning of TMJ conditions, which varied according to the treating clinician.

Optimization of the 3D Printing Parameters on Dimensional Accuracy and Surface Finishing for New Polyamide 6 and Its Composite Used in Fused Deposition Modeling (FDM) Process

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Journal of Mechanical Engineering, 2017 Sep; SI 4(2):75-90.

Abstract: Currently, 3D printing is emerged as one of the attractive manufacturing option to build intricate parts without human intervention. However, the users must be aware of the inherent printer's limitation, particularly related with geometric tolerance of printed materials. This study aims to determine the optimum parameters to fabricate polyamide 6 and filled polyamide through fused deposition modeling (FDM). The studied parameters including printing speed (10-100 mm/s), temperature (240-260°C) and addition of fillers (10 wt%). The rheological properties were evaluated to estimate the behaviour of polyamides through the FDM system. In order to obtain a part with achievable accuracy between the designed and actual dimension, the accuracy of printed part manufactured using production-grade FDM 3D printer by

Statasys Ltd. was used as a benchmark and also assigned in a statistical equation. The surface finishing was also studied under stereomicroscope. It was found that all parameters have a substantial influence on the rheological behaviours. Generally, increasing the printing speed improves its dimensional accuracy however higher temperatures than 250°C was not desired as it lowers the melt viscosity and reduce the geometric precision. The presence of fillers modifies the rheological behavior of the materials with respect to the unfilled polymer, in which the viscosity was slightly reduced particularly at higher shear rates. It can be concluded that high geometric precision and surface finishing can be achieved if the printing settings were correctly set up especially for new materials in FDM process.

Keywords: Fused Deposition Modeling, 3D Printing, Dimensional Accuracy, Surface Finishing, Viscosity

A Functional Pipeline Framework for Landmark Identification on 3D Surface Extracted from Volumetric Data

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PloS One, 2017 Nov;12(11):e0187558;1-25.

Abstract: Landmarks, also known as feature points, are one of the important geometry primitives that describe the predominant characteristics of a surface. In this study we proposed a self-contained framework to generate landmarks on surfaces extracted from volumetric data. The framework is designed to be a three-fold pipeline structure. The pipeline comprises three phases which are surface construction, crest line extraction and landmark identification. With input as a volumetric data and output as landmarks, the pipeline takes in 3D raw data and produces a 0D geometry feature. In each phase we investigate existing methods, extend and tailor the methods to fit the pipeline design. The pipeline is designed to be functional as it is modularised to have a dedicated function in each phase. We extended the implicit surface polygonizer for surface construction in first phase, developed an alternative way to compute the gradient of maximal curvature for crest line extraction in second phase and finally we combine curvature information and K-means clustering method to identify the landmarks in the third phase. The implementations are firstly carried on a controlled environment, i.e. synthetic data, for proof of concept. Then the method is tested on a small scale data set and subsequently on huge data set. Issues and justifications are addressed accordingly for each phase.

The improvement of mechanical and thermal properties of polyamide 12 3D printed parts by fused deposition modelling

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Express Polymer Letters, 2017 Dec;11(12).963-982.

Abstract: This paper addresses the utilisation of fused deposition modelling (FDM) technology using polyamide 12, incorporated with bioceramic fillers (i.e. zirconia and hydroxyapatite) as a candidate for biomedical applications. The entire production process of printed PA12 is described, starting with compounding, filament wire fabrication and finally, FDM printing. The potential to process PA12 using this technique and mechanical, thermal and morphological properties were also examined. Commonly, a reduction of mechanical properties of printed parts would occur in comparison with injection moulded parts despite using the same material. Therefore, the mechanical properties of the samples prepared by injection moulding were also measured and applied as a benchmark to examine the effect of different processing methods. The results indicated that the addition of fillers improved or maintained the strength and stiffness of neat PA12, at the expense of reduced toughness and flexibility. Melting behaviours of PA12 were virtually insensitive to the processing techniques and were dependent on additional fillers and the cooling rate. Incorporation of fillers slightly lowered the melting temperature, however improved the

thermal stability. In summary, PA12 composites were found to perform well with FDM technique and enabling the production of medical implants with acceptable mechanical performances for non-load bearing applications.

Sex Determination using Discriminant Function Analysis in Indigenous (Kurubas) Children and Adolescents of COORG, Karnataka, India: A lateral cephalometric study

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Saudi Journal of Biological Sciences, 2016 Nov;23(6):782-788.

Aim: To test the validity of sex discrimination using lateral cephalometric radiograph and discriminant function analysis in Indigenous (Kuruba) children and adolescents of Coorg, Karnataka, India. **Methods and materials**: Six hundred and sixteen lateral cephalograms of 380 male and 236 females of age ranging from 6.5 to 18 years of Indigenous population of Coorg, Karnataka, India called Kurubas having a normal occlusion were included in the study. Lateral cephalograms were obtained in a standard position with teeth in centric occlusion and lips relaxed. Each radiograph was traced and cephalometric landmarks were measured using digital calliper. Calculations of 24 cephalometric measurements were performed.

Results: Males exhibited significantly greater mean angular and linear cephalometric measurements as compared to females ($p < 0.05$) (Table 5). Also, significant differences ($p < 0.05$) were observed in all the variables according to age (Table 6). Out of 24 variables, only ULTc predicts the gender. The reliability of the derived discriminant function was assessed among study subjects; 100% of males and females were recognized correctly.

Conclusion: The final outcome of this study validates the existence of sexual dimorphism in the skeleton as early as 6.5 years of age. There is a need for further research to determine other landmarks that can help in sex determination and norms for Indigenous (Kuruba) population and also other Indigenous population of Coorg, Karnataka, India. **Keywords:** Discriminant function analysis, Forensic investigation, Indigenous, Lateral cephalograms, Sex determination

Relationship between Hounsfield Unit in CT Scan and Gray Scale in CBCT

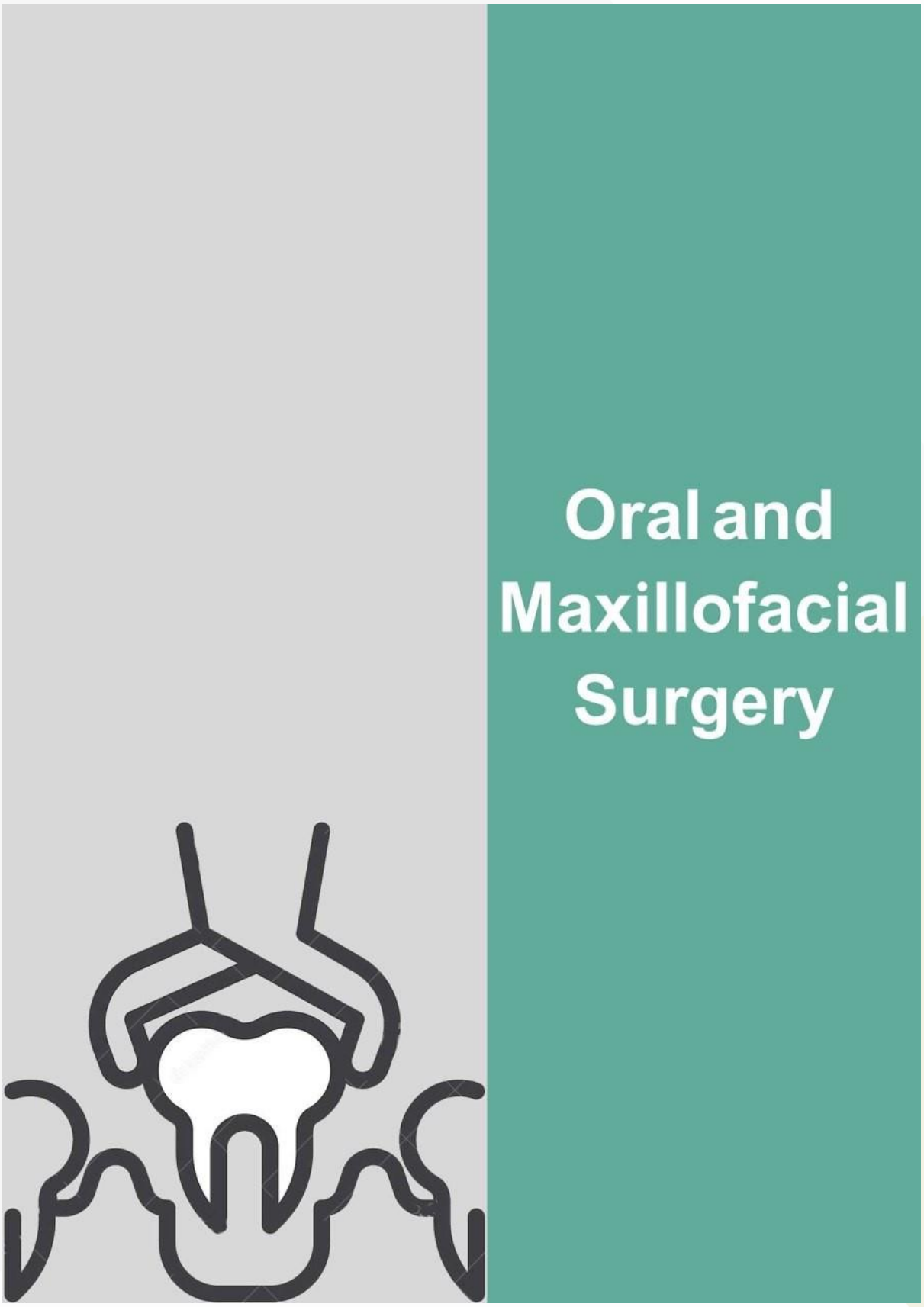
Noorshaida Kamaruddin, ***Zainul Ahmad Rajion***, Asilah Yusof, Mohd Ezane Aziz

AIP Conference Proceedings 2016 Dec;1791(1): 020005.

Abstract: Cone-beam computed tomography (CBCT) is an imaging system which has advantages over computed tomography (CT). Recently, CBCT has become widely used for oral and maxillofacial imaging. In CT scan, Hounsfield Unit (HU) is proportional to the degree of x-ray attenuation by the tissue. In CBCT, the degree of x-ray attenuation is shown by gray scale (voxel value). The aim of the present (*in vitro*) study was to investigate the relationship between gray scale in CBCT and HU in CT scan. In this descriptive study, the anthropomorphic head phantom was scanned with CBCT and CT scanner. Gray scales and HUs were detected on images at the crown of the teeth, trabecular and cortical bone of mandible. The images were analyzed to obtain the gray scale value and HU value. The obtained value then used to investigate the relationship between CBCT gray scales and HUs. For the statistical analysis, t-test, Pearson's correlation and regression analysis were used. The differences between the gray scale of CBCT and HU of CT were statistically not significant, whereas the

Pearson's correlation coefficients demonstrated a statistically significant correlation between gray scale of CBCT and HU of CT values. Considering the fact that gray scale in CBCT is important in pre assessment evaluation of bone density before implant treatments, it is recommended because of the lower dose and cost compared to CT scan.

Topics: Regression analysis, Educational assessment, Covariance and correlation, Mandible, Computed tomography


Oral and
Maxillofacial
Surgery

2.6 ORAL AND MAXILLOFACIAL SURGERY

The Prevalence of Non-Syndromic Orofacial Clefts and Associated Congenital Heart Diseases of a Tertiary Hospital in Riyadh, Saudi Arabia

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The Saudi Dental Journal, 2021 Mar; 33(3):137-142.

Background: Orofacial clefts are considered one of the most common birth defects and are frequently associated with other malformations. Congenital heart disease is one of the most prevalent congenital malformation.

Objective: To investigate the prevalence of congenital heart diseases associated with non-syndromic orofacial clefts in the Saudi population.

Methods: Electronic files of non-syndromic orofacial cleft patients who visited the Oral and Maxillofacial Surgery Department in King Abdulaziz Medical City of Riyadh, Saudi Arabia from January 2015 to December 2018 were retrospectively reviewed. Data were recorded in an excel sheet and analyzed using SPSS via frequency tests.

Results: In the cleft children identified, the prevalence of non-syndromic orofacial clefts was (77%). Orofacial clefts showed a male predominance (62%). The most common orofacial phenotype was unilateral cleft lip and palate (34%). The prevalence of associated congenital malformations with orofacial clefts was (41%). The most prevalent congenital malformation was congenital heart disease (35%), mainly found in unilateral cleft lip and palate patients (33%). The prevalence of associated congenital heart disease with orofacial clefts was (19%). The most frequent type of congenital heart disease was atrial septal defect (37%).

Conclusion: This study highlights the recognition of the associated congenital heart disease with non-syndromic orofacial cleft patients. Global screening protocols designed for newborns with non-syndromic orofacial cleft are needed to eliminate late diagnosis of critical congenital heart diseases which might present operative risks of anesthesia and/or surgical procedures.

Keywords: Prevalence, Non-syndromic, Orofacial cleft, Cleft lip and palate, Congenital heart disease, Saudi Arabia

Antimicrobial resistance, mechanisms and its clinical significance

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Disease-a-Month, 2020 Jun; 66(6):100971.

Abstract: Antimicrobial agents play a key role in controlling and curing infectious disease. Soon after the discovery of the first antibiotic, the challenge of antibiotic resistance commenced. Antimicrobial agents use different mechanisms against bacteria to prevent their pathogenesis and they can be classified as bactericidal or bacteriostatic. Antibiotics are one of the antimicrobial agents which has several classes, each with different targets. Consequently, bacteria are endlessly using methods to overcome the effectivity of the antibiotics by using distinct types of mechanisms. Comprehending the mechanisms of resistance is

vital for better understanding and to continue use of current antibiotics. Which also helps to formulate synthetic antimicrobials to overcome the current mechanism of resistance. Also, encourage in prudent use and misuse of antimicrobial agents. Thus, decline in treatment costs and in the rate of morbidity and mortality.

This review will be concentrating on the mechanism of actions of several antibiotics and how bacteria develop resistance to them, as well as the method of acquiring the resistance in several bacteria and how can a strain be resistant to several types of antibiotics. This review also analyzes the prevalence, major clinical implications, clinical causes of antibiotic resistance. Further, it evaluates the global burden of antimicrobial resistance, identifies various challenges and strategies in addressing the issue. Finally, put forward certain recommendations to prevent the spread and reduce the rate of resistance growth.

Keywords: Antibiotics, Antimicrobial resistance (AMR), Mechanisms of antimicrobial action

The Quality of the Evidence in Craniomaxillofacial Trauma: Are We Making Progress?

Omar Suhaym, Ashley Houle, Andrew Griebel, Michael Miloro, Nicholas Callahan.

Journal of Oral and Maxillofacial Surgery, 2021 Apr;79(4):e1-7.

Purpose: The purpose of this study is to evaluate the level of evidence in the craniomaxillofacial trauma literature. The secondary purpose is to determine if improvement in the quality of evidence has been made over the past 2 decades.

Materials and Methods: This retrospective cohort study analyzed clinical articles published in select craniomaxillofacial surgery journals. Patient-focused articles were selected. The year of publication (1999, 2009, 2019) was the primary predictor variable. Secondary predictor variables included study funding status, anatomical facial region (eg maxilla, mandible, and so on), specific journal, and journal impact factor. The level of evidence was determined using the Center of Evidence-Based Medicine criteria, which served as the outcome variable. The statistical analysis included descriptive, bivariate, and regression analysis.

Results: The sample consisted of 469 craniomaxillofacial trauma articles, with 13.2% being published in 1999, 44.1% in 2009, and 42.6% in 2019. The majority of the studies (77.5%) were published in 4 journals. The impact factor varied among the journals with a significant improvement in the mean impact factor from (0.89 ± 0.29) in 1999 to (1.4 ± 0.47) in 2009 and a slight decline in 2019 (1.26 ± 0.71). Mandibular fractures (31.6%) and orbital trauma (26%) were the most investigated topics. Level 4 studies accounted for 67.4% of the sample, with level 3 evidence of 4.7%, level 2 of 22.6%, and level 1 of 5.3% of the included studies. Significant progress in the level of evidence has been made from 1999 but not since that time ($P = .002$). It is unclear why this may be but sheds light on the need for further development of high quality studies. Finally, a higher quality of evidence is associated with journal impact factor (odds ratio = 1.9; $P < .01$) and funded research (odds ratio = 4.69; $P = .02$).

Conclusions: While there has been some improvement in the level of evidence in the craniomaxillofacial trauma literature over the past 2 decades, the current quality remains low, and further progress is needed to support the practice of evidence-based medicine.

Retrobulbar hemorrhage following tooth extraction: Case report & anatomical correlation

Omar Suhaym, Osama Alghamdi, Julia Pompura.

Oral and Maxillofacial Surgery Cases, 2020 Mar;6(1):100142.

Abstract: Retrobulbar hemorrhage (RBH) is a rare but potentially devastating complication that can lead to permanent vision loss. Prompt identification and appropriate intervention are critical to avoid irreversible blindness. Practitioners are aware of the potential development of RBH secondary to orbital floor reconstruction, blepharoplasty, and endoscopic sinus surgery, however, rarely due to dental procedures. In this case report, we present RBH resulting following upper wisdom tooth extraction and to review the possible anatomical pathway underlying this complication.

Keywords: Retrobulbar hemorrhage, Dental extraction complications, Wisdom teeth, Orbital hematoma, Teeth extraction

Tissue Engineering for the Temporomandibular Joint: An Updated Review

Ahmed Hassan Kamil Mustafa.

Dentistry and Craniofacial Research, 2020 Jul; 5(2):125.

Introduction: Tissue engineering potentially opens new hope for the treatment o disorders of the temporomandibular joint which frequently afflict patients. Damage or disease in this area interferes with masticatory function and speaking, reducing patients' quality of life. Effective treatment options for patients suffering from severe temporomandibular joint disorders are in high demand because surgical options are restricted to removal of damaged tissue or complete replacement of the joint with prosthetics. Tissue engineering techniques for the temporomandibualr joint opens new horizons for the clinical management of temporomandibular disorders.

Materials and methods: Website search (Pubmed, PMC) using the key words, Temporomandibular joint disorder; Condylar fibrocartilage; Temporomandibular joint disc; Scaffold-based tissue engineering; Scaffold-free tissue engineering; TMD

Conclusion: Tissue engineering of the TMJ is still an area of research due to the prevalence of TMD. Tissue engineering is a rapidly evolving field with the ongoing development in scaffold fabrication, cellularization strategies, and growth factor delivery; and many of these techniques have been applied to the TMJ. However, there are still challenging problems that remained unsolved.

Keywords: Temporomandibular joint disorder; Condylar fibrocartilage; Temporomandibular joint disc; Scaffold based tissue engineering; Scaffold-free tissue engineering; TMD

A cross-sectional study of the prevalence and severity of maxillofacial fractures resulting from motor vehicle accidents in Riyadh, Saudi Arabia

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The Saudi Dental Journal, 2020 Sep; 32(6):314-320.

Objectives: To investigate the prevalence and severity of maxillofacial fractures resulting from motor vehicle accidents (MVAs) at King Abdulaziz Medical City (KAMC), Riyadh, Saudi Arabia.

Materials and methods: A cross-sectional study of 325 males (89%) and 47 females (9%) was conducted that retrospectively reviewed records of patients referred to oral and maxillofacial surgery department from emergency department from 1st January 2016 to 31st December 2017 at KAMC, Riyadh.

Results: A total of 372 subjects were included in the study. MVAs (80%) were the most prevalent cause of trauma. The age range most susceptible to MVAs was between 20 and 24 years old (28%). The most common site of fracture was the midface (64%), specifically orbit (32%). For mandibular fractures, the subcondylar was the most common site of fractures (19%). The most common treatment approach was conservative (65%). In terms of severity, approximately half of patients needed admission to the intensive care unit (ICU) (50%); the mean score on the Glasgow Coma Scale (GCS) was 11.34, but most scores fell in the mild range; and (68%) of subjects presented with other associated systemic injuries, especially orthopedic injuries (36%).

Conclusions: MVAs were the main cause of trauma and affected mainly young males. The most common site of fracture was midface, specifically orbit. Subcondylar was the most prevalent fracture site for mandibular fractures. The severity of MVAs injuries was significantly higher compared to non-MVAs injuries. We suggest enforcing legislation and regulations on road safety such as the use of compulsory seat belts.

Keywords: Accidents, Traffic, Maxillofacial injuries, Saudi Arabia

Mineralized Plasmatic Matrix for Horizontal Ridge Augmentation in Anterior Maxilla with and without a Covering Collagen Membrane

Ehad Abdelfadil, ***Wael Aboelmaaty***

The Open Dentistry Journal, 2020 Dec; 14:743-751.

Background: Mineralized Plasmatic Matrix [MPM] is a unique form of platelet rich fibrin that contains mineralized bone graft particles within a fibrin network.

Aim: This study was conducted to evaluate horizontal ridge augmentation using MPM with and without a coverage membrane.

Materials and Methods: Sixteen edentulous spaces were randomly divided into 2 equal groups. MPM was used for horizontal ridge augmentation with and without a covering collagen membrane (group 1 and 2, respectively). Cone Beam CT images were obtained preoperatively as well as 1 week and 4 months postoperatively to evaluate alveolar ridge and the resorption of the grafting material at 3 predetermined points along with the site where the future dental implant will be placed. Student's t-test (Unpaired) was used for comparing two different groups with quantitative parametric data and student's t-test (Paired) was used for comparing two related groups with quantitative parametric data while repeated measures ANOVA (Analysis of variance) followed by post-hoc Bonferroni was used for comparing more than two related groups with quantitative parametric data. Student's t-test (Unpaired) was used for comparing two different groups with quantitative parametric data and student's t-test (Paired) was used for comparing two related groups with quantitative parametric data while repeated measures ANOVA (Analysis of variance) followed by post-hoc Bonferroni was used for comparing more than two related groups with quantitative parametric data.

Results: There was no statistically significant difference between the gained bone width in both groups. More but not statistically significant resorption was recorded in group 2.

Conclusion: MPM can be successfully used for horizontal ridge augmentation without a barrier membrane.

Keywords: MPM, Collagen membrane, Ridge augmentation, Bone graft, Radiographic evaluation, Maxilla.

Comparative study of Articaine and Lidocaine without Palatal Injection for Maxillary Teeth Extraction

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Clinical Oral Investigations, 2019 Aug;23(8):3239-3248.

Objectives: There is significant evidence that articaine and lidocaine buccal injections alone are sufficient for painless extraction of maxillary teeth. The aim of this study was to evaluate the extraction of permanent maxillary teeth and to compare pain control between articaine and lidocaine without palatal injection.

Materials and methods: Group A received buccal and palatal injections of 2% lidocaine with 0.015 mg/ml epinephrine. Group B received only buccal local anesthetic injection of 2% lidocaine with 0.015 mg/ml epinephrine. Group C received only buccal injection of 4% articaine with 0.012 mg/ml epinephrine. The patients' perception of pain was assessed using visual analogue scale and verbal response scale after the injection and the extraction.

Results: Statistical analysis showed that the difference in pain perception of local anesthetic injection was statistically significant between groups A and B and between groups A and C ($p < 0.05$).

Conclusion: The extraction of permanent maxillary teeth is possible without palatal injections and there is no difference between articaine and lidocaine.

Clinical relevance: Local anesthetic agents are the most frequently administered drugs in dentistry and represent the primary method of pain control for patients undergoing intraoral procedures.

Keywords: Articaine; Buccal infiltration; Lidocaine; Maxillary teeth extraction; Palatal injection; Visual analogue scale.

Systemic Review: Canine Impaction: Prevalence, Causes, Classifications, complications and Management

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Indo American Journal of Pharmaceutical Sciences, 2019 Oct; 6(10):13573-13576.

Abstract: The aim of this present article is to systemically review the topic of canine impaction and its components: prevalence, causes, classifications, complications, and management. The materials and methods used for this review is to search in the PubMed database using the advanced features. Keywords like canine impaction, causes, prevalence, classifications, management were used to search the database. The search aimed to identify all relevant studies written in English language. A total of 17 papers were reviewed and included in the final systemic review according to the specific keywords. Exclusion criteria were applied to exclude studies that were not PubMed indexed. With maxillary canine being the second most commonly impacted tooth after third molars, it is important to understand the causes in order to prevent it or manage it early. Therefore, further studies should be conducted as the causes are still unclear and not definitive. Moreover, the need of internationally accepted classification of canine impactions is advisable for canine impaction assessment as well as for planning for surgical operation. As for the complications, the worst complication is maxillary incisors root resorption. However, further researches using high technology (CBCT) are needed to determine a more precise percentage of root resorption cases related to maxillary canine impaction.

Keywords: canine impaction, causes, prevalence, classifications, management

Pattern of Antibiotic Prescription among Dentists in Riyadh, Saudi Arabia

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Journal of Investigative and Clinical Dentistry, 2018 Aug; 9(3):e12339.

Aim: The aim of the present study was to investigate the pattern of antibiotic prescription and dentists' awareness about the recent guidelines for antibiotic prescription.

Methods: This cross-sectional study was conducted among 282 dentists practicing in Riyadh, Saudi Arabia. The data were collected from 20 randomly-selected dental clinics from each of the five administrative blocks in Riyadh. In addition, data were also collected from four tertiary care centers and three academic universities. The questionnaire measured the antibiotic prescription pattern of the dentists and their choice of antibiotics for various dental conditions.

Results: Amoxicillin was the most commonly prescribed antibiotic. More than 70% of dentists prescribed antibiotics for dental patients with various cardiac conditions. Bivariate analysis showed that female dentists had significantly higher mean scores for ideal prescription pattern (P = .04) compared to male dentists. Saudi nationals, especially those working in the government sector were found to have better prescription pattern compared with others (P = .02). Dentists with higher educational qualifications (board certificate and above) had a more ideal prescription pattern than other dentists (P = .04).

Conclusion: Inappropriate antibiotic prescription practice was highly prevalent in this population.

Keywords: antibiotic prescription; antibiotic resistance; dentist; infection knowledge.

Dental Implant Length and Diameter: a Proposed Classification Scheme

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Journal of Prosthodontics, 2017 Apr;26(3):252-260.

Purpose: To propose a length-and-diameter-based classification scheme for dental implants to standardize terminology in the dental literature and communication between interested parties.

Materials and methods: This study was mainly based on searching two major resources: published scientific research papers and 14 of the most popular dental implant manufacturers. Indexed databases were searched from January 2004 up to and including February 2016 using the keywords "dental implant length" and "dental implant diameter." Retrieved titles and abstracts were screened, and related full-text articles were reviewed. Full-text articles that clearly stated the terms and measurements of implants used were included and considered for proposing this classification scheme.

Results: The initial search for implant diameter and length yielded 1007 and 936 articles, respectively. A total of 85 studies (41 about diameter, 44 about length) were selected and reviewed. The remaining studies (966 about diameter, 892 about length) that did not abide by the eligibility criteria were excluded. The terms "long," "short," "standard," "wide," and "narrow" were the most commonly used terms in the literature. A classification scheme for implants by diameter and length was proposed.

Conclusions: Indexed publications contain a variety of terms used by authors to describe diameter and length of dental implants without conformity and standardization. The classification scheme proposed in this article could serve as a reference for interested parties.

Keywords: Dental implant; classification; diameter; length; size.

Cutaneous Rosai-Dorfman disease of the face: A comprehensive literature review and case report

Taiseer Hussain Hassan Al-Khateeb

Journal of Oral and Maxillofacial Surgery, 2016 Mar;74(3):528-540.

Purpose: Cutaneous Rosai-Dorfman disease (C-RDD) is a rare, benign, non-Langerhans cell histiocytosis that can affect any skin area. The purpose of this study was to characterize C-RDD of the face through a literature review of published case reports of this lesion and present a new case of C-RDD.

Materials and methods: An English-language search of 3 databases (PubMed, Scopus, and EBSCO Search) was conducted for cases of C-RDD of any skin area that had been published since 1969. Repeated citations of the same article in more than 1 database were deleted. Cases of C-RDD with solely facial involvement or involving the face and other skin parts were included and analyzed. Details of C-RDD cases (demographic features, regional distribution, clinical presentation, treatment, and follow-up course) were methodically reviewed and collected in Excel spreadsheets. Simple statistical analyses were conducted using Excel.

Results: The literature search yielded 578 published cases of C-RDD affecting any skin area; of these, 65 cases (11.2%) had facial skin involvement. The male-to-female ratio was 1:1.5, and the average age at presentation was 43.5 years (standard deviation, 12.4 yr). The racial distribution of facial C-RDD was, in descending order, 74.5% in Asians, 20% in Caucasians, and 5.5% in blacks. The most commonly affected facial skin regions were the cheeks and periorbital area, and most lesions were multiple in number and bilaterally distributed. The vast majority of facial C-RDD lesions presented as asymptomatic, nonulcerative, red, nodular plaques with durations ranging from 1 month to a few years. Many methods have been attempted for the treatment of facial C-RDD. However, the combined cure rate for all published treatment methods was only 28.6%. Surgical excision was the most effective treatment method, and corticosteroids were the least effective.

Conclusion: This article has tried to characterize facial C-RDD lesions for easier management by maxillofacial surgeons.

Effects of myrrh on the strength of suture materials: an in vitro study

Mohammed A. Alshehri, Jagan Kumar Baskaradoss***, Amrita Geevarghese***, Ravikumar Ramakrishnaiah, Dimitris N. Tatakis

Dental Materials Journal, 2015 Mar;34(2):148-153.

Abstract: The present in vitro study sought to determine the effects of myrrh-containing solutions on common suture materials used in periodontal surgery. Three commonly used suture materials (silk, polyglactin 910, polytetrafluoroethylene) were immersed in four thermostatically controlled experimental media to simulate daily oral rinsing activity, namely -artificial saliva, normal saline solution with 0.2% Commiphora myrrh, full-concentration (100%) Commiphora myrrh oil, and a myrrh-containing commercial mouthwash. Tensile strength was measured at the end of each day using an Instron tensile testing machine. Silk sutures were susceptible to tensile strength loss when exposed to 0.2% myrrh solution once

daily for 5 days. Myrrh-containing commercial mouthwash had no effect on tensile strength, but all three suture materials lost tensile strength when exposed to 100% myrrh oil. For patients that routinely use myrrh mouthwashes postoperatively, findings of this study suggested that silk sutures might not be the optimal material choice.

Keywords: Myrrh, Suture materials, Tensile strength, Wound healing

Ultrasound-Guided Core Biopsy in the Diagnostic Work-up of Tuberculous Lymphadenitis in Saudi Arabia, Refining the Diagnostic Approach. Case series and review of literature

Othman Altuwairgi, Salim Baharoon, Yosra Alkabab, Eiman Alsafi, Mohammed Almoweqel, Hamdan Al-Jahdali.

Journal of Infection and Public Health, 2014 Sep-Oct;7(5):371-376.

Objective: Tuberculous cervical lymphadenitis is the most common presentation of extrapulmonary tuberculosis (TB) in Saudi Arabia and worldwide. Obtaining a tissue biopsy for culture and histopathology is frequently needed to establish the diagnosis. The available diagnostic tools include excisional surgical biopsy, fine needle aspiration (FNA) and ultrasound-guided core lymph node biopsy. We present a single center experience of the use of ultrasound-guided core lymph node biopsy as a diagnostic tool for tuberculous lymphadenitis.

Methods: A retrospective review of the interventional radiology database for all of the patients with cervical lymphadenopathy undergoing ultrasound-guided core biopsy at King Abdulaziz Medical City-Riyadh, Saudi Arabia from January 1 2008 to December 30 2011. The data were the patient demographics, clinical characteristics, biopsy method and pathological and clinical diagnoses.

Results: Five cases underwent ultrasound-guided cervical lymph node biopsy during the study period. A total of 55 cases underwent excisional cervical lymph node biopsy in the same period. The age of the patients who underwent the core biopsy ranged from 18 to 76 years old. All of the biopsies were performed as one-day surgery, and all of the patients were discharged on the same day with no complications. The final diagnosis was confirmed in all of the cases (100%); with tuberculosis being the diagnosis in four of the five cases (80%), and one case being diagnosed as lymphoma.

Conclusion: Ultrasound-guided core biopsy is an underutilized procedure in our hospital and could be a very valuable asset in the diagnostic algorithm of tuberculous lymphadenitis in Saudi Arabia. The widespread use of the procedure would positively affect patient care, providing earlier diagnosis and treatment.

Keywords: Ultrasound-guided biopsy; Ultrasound-guided core biopsy; Ultrasound-guided lymph node biopsy.

Flapless Dental Implant Surgery for Patients on Oral Anticoagulants-The “WarLess Procedure”: A Report of 2 Cases

Hamad Al Zoman, Samer Al Jetaily, Asirvatham Alwin Robert, Jagan Kumar Baskaradoss, ***Abdulaziz Al-Suwyed***, Sabistan Ciancio, Sultan Al Mubarak

Journal of Oral Implantology, 2013 May;39(s1):264-270.

Abstract: Patients with prosthetic heart valves are maintained on lifelong oral anticoagulant therapy. The optimal anticoagulant management of such patients during surgical dental procedures has been debated for a long time. Compared with conventional dental implant placement, a minimally invasive flapless approach has the potential to reduce bleeding and minimize surgical time, postoperative pain, soft tissue inflammation, and crestal bone. The purpose of these case reports is to show the clinical predictability of dental implant placement using a minimally invasive flapless approach without reducing the dosage of anticoagulants for patients on lifelong anticoagulant therapy. In this study, a 45-year-old woman and a 58-year-old man who had undergone cardiac surgery and were currently under a full therapeutic level of anticoagulation therapy (warfarin) were treated with flapless dental implant surgery without reducing their anticoagulant dosage. Postoperative clinical and radiographic assessment showed no abnormality, minimal signs of inflammation, and excellent healing. The combination of minimally invasive flapless dental implant surgery with no interruption in the normal dose of the anticoagulant medications could be an improved method for placing dental implants in patients on long-term anticoagulant therapy.

Keywords: dental implants, oral anticoagulants, warfarin, flapless implant surgery

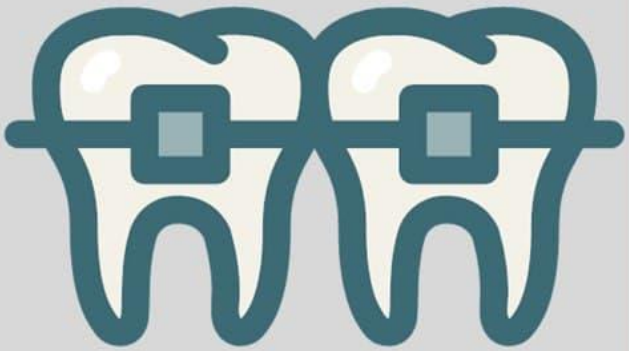
Surgical Management of Bisphosphonate-related Osteonecrosis of the Jaw: Report of Three Cases

Khalid H. Al-Zoman, Saleh AlBazie, Asirvatham A. Robert, ***Jagan Kumar Baskaradoss***, Abdulaziz S. Alsuwyed, Sabistan Ciancio, Sultan Al-Mubarak

Journal of Palliative Care, 2013 Mar;29(1):52-57.

No Abstract

Orthodontics



2.7 ORTHODONTICS

Presurgical intervention of bilateral cleft lip and palate using nasoalveolar molding with a microfiber head cap.

Najla S. Alrejaye, Muhannad H. Alharbi, Hussam M. Alqahtani, Mosleh S. Alharbi.

Journal of Cleft Lip Palate and Craniofacial Anomalies, 2021;8:69-72.

Abstract: Nasoalveolar molding (NAM) was introduced by Grayson et al. in 1993. NAM helps with reshaping of the maxillary arch deformity and nose before surgical lip repair. NAM involves lengthy and extensive use of taping and skin barriers to the infant's cheeks, which usually causes skin irritation and discomfort. This is a case report describing NAM, for an infant with bilateral cleft lip and palate and severely malpositioned premaxilla. In this case, a special head cap with straps was used to secure the NAM appliance instead of the conventional taping. After NAM, there was a significant improvement in the cleft deformity. The parents were very satisfied about the result and felt much more comfortable using the head cap with the special straps compared to the conventional taping because it reduced cheek irritation and was much easier to use.

Keywords: Cleft lip and palate, head cap, NAM, nasoalveolar molding, taping

Long-term periodontal changes associated with oral appliance treatment of obstructive sleep apnea.

Piyush Heda, ***Bassam Alalola***, Fernanda R. Almeida, Hugh Kim, Bernardo U. Peres, Benjamin T. Pliska.

Journal of Clinical Sleep Medicine. 2021 May 14, ahead to print.

Study objectives: To characterize the mandibular anterior teeth crown height as a marker of periodontal changes and bone loss as a side effect of an oral appliance (OA) worn for a minimum of 4.5 years.

Methods: This retrospective study conducted on patients with healthy baseline periodontium recruited participants from consecutive sleep apnea patients treated with an OA between 2004 to 2014. Eligible participants were recalled for a follow-up visit where a periodontal exam was performed, a lateral cephalogram and dental impressions were obtained. Clinical crown height for mandibular anterior teeth and cephalometric variables were measured and compared before and after treatment. A full periodontal evaluation was performed at the follow-up visit.

Results: 21 patients enrolled with a mean treatment length of 7.9±3.3 years. For the mandibular anterior teeth, clinical crown height did not change over the evaluated period. At follow-up, all the periodontal assessed variables were within normal limits, with the mean probing depth of 1.4±0.5 mm, recession 0.6±1.1 mm and Clinical Attachment Loss (CAL) 0.8±1.0 mm. Compared to baseline, there was a significant proclination of mandibular incisors (mean increase of 5.1°) with the continued use of OA. Gingival levels were maintained with clinically insignificant changes during the observation period.

Conclusions: Inclination of the mandibular incisors increases significantly with the use of an OA in patients with obstructive sleep apnea (OSA). Positional changes in these teeth were not associated with any measured evidence of increase in clinical crown height or gingival recession.

Keywords: obstructive sleep apnea; oral appliances; periodontal changes.

Changes of Periodontal Tissues Because of Orthodontic Treatment: A Retrospective Study.

Hamad Alzoman, ***Khalid Alamoud***, Waad K. Alomran, Abdulaziz Almudhi, Naif A. Bindayel.

Journal of Advanced Oral Research. 2021 Apr 4:23202068211003416, ahead to print.

Aim: To evaluate the periodontal status before and after orthodontic treatment and to analyze the confounding factors associated with it.

Materials and Methods: The present retrospective study analyzed pre- and posttreatment records of a total of 60 patients. Intraoral digital photographs before and after the orthodontic treatment were used to measure the following three periodontal variables: (a) width of the keratinized gingiva, (b) gingival recession, and (c) the status of interdental papilla. The ImageJ 46 software imaging program was used to perform the required measurements. The clinical data were then analyzed in an association with the participants' demographic data, the type of orthodontic tooth movement, and other confounding factors. The data obtained were manually entered into the statistical package and analyzed using a significance level set at $P < .05$. Descriptive statistics, paired *t*-tests, and Pearson's correlation analysis were used to identify differences among the studied variables.

Results: Among the 60 patients, the majority (66.7%) were females. Most cases of the treated malocclusion were Class II, and most patients underwent intrusion and retrusion movements. The width of keratinized gingiva increased for most sites of upper teeth. In contrast, the lower teeth showed a mix of improvement and compromised width of keratinized gingiva. As a measure of gingival recession, the difference of clinical crown height revealed the tendency toward a reduced clinical crown height for most sites. Upper left lateral incisors and canines showed significant values with regard to keratinized gingival width measurements and tooth movements such as extrusion and intrusion movements. Likewise, with regard to the clinical crown height, upper right central incisors showed significant differences when correlated with the interincisal angle, lower incisors to the mandibular plane, and upper incisors to the NA line. The upper lateral incisors also showed significant correlations to certain cephalometric measurements.

Conclusions: The orthodontic treatment was found to exert a significantly positive impact on the surrounding periodontium, particularly in the upper canine areas. Likewise, various types of tooth movement were found to positively affect the periodontium.

Keywords: Periodontal health, Orthodontic treatment, Tooth movement, Clinical crown height

Premolar Substitution of Impacted Canine Associated with Dentigerous Cyst. A Case Report of an Interdisciplinary Approach.

Bassam Alalola.

International Journal of Medical Dentistry. 2021 Mar;25(1):102-110.

Abstract: Impacted canines are commonly associated with the development of dentigerous cysts, which can be extensive if they are identified late. The surgical management of such cysts by enucleation and extraction can result in significant bony defects that can complicate patient's comprehensive management. This case report presents the conservative interdisciplinary management of an impacted canine associated with an extensive dentigerous cyst. The treatment involved enucleation and extraction of the impacted canine, an initial period of passive eruption of an impacted tooth into the resulting bony defect, followed by an active orthodontic movement and conservative restoration of the substituted premolar. This technique allowed the resolution of the bony defect without resorting to bone grafting.

Keywords: impacted canine, dentigerous cyst, premolar substitution.

3D Prosthodontic Treatment Planning for Orthodontic Patients: Interdisciplinary Approach

Walaa Magdy Ahmed, ***Bassam Alalola, Mohammed Alsaloum***, Tyler Verhaeghe, James Andrew, Mohamed-Nur Abdallah.

In: Retrouvey JM., Abdallah MN. (eds) 3D Diagnosis and Treatment Planning in Orthodontics. Springer, Cham. 2021 Mar. (Book Chapter)

Book Summary: This richly illustrated book is a wide-ranging guide to modern diagnostics and treatment planning in orthodontics, which are mandatory prior to the initiation of any type of comprehensive treatment. The importance of three-dimensional (3D) imaging techniques has been increasingly recognized owing to the shortcomings of conventional two-dimensional imaging in some patients, such as those requiring complex adult treatment and those with temporomandibular joint dysfunctions or sleep disturbances. In the first part of this book, readers will find clear description and illustration of the diagnostic role of the latest 3D imaging techniques, including cone beam computed tomography, intra-oral scanning, and magnetic resonance imaging. The second part explains in detail the application of 3D techniques in treatment planning for orthodontic and orthognathic surgery. Guidance is also provided on the use of image fusion software for the purposes of accurate diagnosis and precise design of the most appropriate biomechanical approach in patients with malocclusions.

Scope and performance of artificial intelligence technology in orthodontic diagnosis, treatment planning, and clinical decision-making-A systematic review

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Journal of Dental Sciences, 2021 Jan;16(1):482-492.

Background/purpose: In the recent years artificial intelligence (AI) has revolutionized in the field of dentistry. The aim of this systematic review was to document the scope and performance of the artificial intelligence based models that have been widely used in orthodontic diagnosis, treatment planning, and predicting the prognosis.

Materials and methods: The literature for this paper was identified and selected by performing a thorough search for articles in the electronic databases like Pubmed, Medline, Embase, Cochrane, and Google scholar, Scopus and Web of science, Saudi digital library published over the past two decades (January 2000–February 2020). After applying the inclusion and exclusion criteria, 16 articles were read in full and critically analyzed. QUADAS-2 were adapted for quality analysis of the studies included.

Results: AI technology has been widely applied for identifying cephalometric landmarks, determining need for orthodontic extractions, determining the degree of maturation of the cervical vertebra, predicting the facial attractiveness after orthognathic surgery, predicting the need for orthodontic treatment, and orthodontic treatment planning. Most of these artificial intelligence models are based on either artificial neural networks (ANNs) or convolutional neural networks (CNNs).

Conclusion: The results from these reported studies are suggesting that these automated systems have performed exceptionally well, with an accuracy and precision similar to the trained examiners. These systems can simplify the tasks and provide results in quick time which can save the dentist time and help the dentist to perform his duties more efficiently. These systems can be of great value in orthodontics.

Keywords: Artificial intelligence; Automated orthodontic diagnosis; Deep learning; Machine learning; Artificial neural networks; Convolutional neural networks

Sleep-disordered breathing among Saudi children seeking orthodontic treatment

Ali A. Al Ehaideb, Norah M. Almufadhi, ***Ghaida M Ab Alhassn, Amal A. Fallatah,*** Shazia Adnan, Areej A. Alsubaie.

Journal of Family Medicine and Primary Care, 2021 Jan;10(1):205-12

Aims: The aim of 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.

Settings and Design: It is a cross-sectional survey-based study. **Methods and Material:** 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. **Statistical Analysis Used:** PSQ scores were tested with multiple variables including gender, parents' education, academic performance using Mann-Whitney-U test. Correlation of study sample scores with age were calculated using the Spearman rank correlation coefficient (rho).

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 ≤ 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)*.

Conclusions: 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.

Keywords: Children, orthodontic treatment, pediatric sleep questionnaire, sleep disordered breathing

Comparison of bite force on the dominant and nondominant sides of patients with habitual unilateral chewing: a pilot study

Sulthan Ibrahim Raja Khan, Dinesh Rao, Anupama Ramachandran, Baskaran Veni Ashok.

General Dentistry, 2020 Mar-Apr; 68(2):60-63.

Abstract: Occlusion and chewing-side preference (CSP) are complex aspects of the stomatognathic system. The present study aimed to record the difference in bite force between the dominant and nondominant chewing sides of patients with a CSP. A sample of 95 subjects (aged 20-35 years) with established CSPs was selected. Measurements of bite force on both sides of the jaw were recorded while the subjects were seated in an upright, forward-looking, unsupported natural position. The recordings of each subject were accomplished in a single session with a portable customized bite recording sensor, and the maximal voluntary bite force (MVBF) value was recorded in newtons. The MVBF data were compared in pairs (dominant vs nondominant side; men vs women; and age < 30 vs ≥ 30 years) with independent-samples t tests. The combined mean (SD) MVBF for men and women was 694.73 (110.47) N on the dominant chewing side and 507.20 (86.76) N on the nondominant chewing side. In the male group, the mean MVBF was significantly greater (P < 0.0001) on the dominant chewing side (755.73 N) than on the nondominant chewing side (548.10 N). Similarly, in the female group, the mean MVBF was significantly greater (P < 0.0001) on the dominant chewing side (620.95 N) than on the nondominant chewing side (457.74 N). Furthermore, the differences between the male and female dominant sides and between the male and female nondominant sides were statistically significant (P < 0.0001). However, there was no statistically significant difference in bite force between the age groups (P > 0.05).

Keywords: bite force management; chewing-side preference.

Pre-prosthetic orthodontics

Hayam Alfallaj.

The Saudi Dental Journal, 2020 Jan; 32(1): 7-14.

Abstract: For some patients, pre-prosthetic orthodontic intervention is necessary to optimize both esthetic and functional aspects of dental treatment. This review will focus on the following topics: orthodontics treatment with multiple missing teeth, correction of anterior deep vertical overlap, anterior worn dentition, up-righting of tilted teeth, and orthodontic crown lengthening. This review will aid restorative dentists in identifying which patients could benefit from orthodontic intervention, and in understanding how orthodontic treatment can be utilized to improve patient prognosis in restorative treatment.

Keywords: Orthodontics, Interdisciplinary, Crown-lengthening, Worn-teeth, Tilted-molar

Outcomes of orthodontic treatment performed by individual orthodontists vs 2 orthodontists collaborating on treatment.

Suliman A. Alsaeed, David B. Kennedy, Jolanta Aleksejuniene, Edwin H. Yen, Benjamin T. Pliska, Donal C. Flanagan.

American Journal of Orthodontics and Dentofacial Orthopedics, 2020 Jul;158(1): 59-67.

Introduction: One factor that can affect treatment outcomes is the treatment provider, and this factor has not been extensively studied. This research aimed to evaluate orthodontic treatment quality, length, and efficiency when 2 orthodontists collaborated on treatment, compared with the treatment provided solely by either orthodontist.

Methods: A total of 150 consecutively treated subjects were divided into 3 equal groups based on the treating clinician. Patients in group A were treated by orthodontist A, group B by orthodontist B, and group C by both orthodontists in collaboration. The Peer Assessment Rating (PAR), Index of Complexity, Outcome, and Need (ICON), American Board of Orthodontics–Discrepancy Index, and American Board of Orthodontics–Cast and Radiographic Evaluation were used to assess the pretreatment and posttreatment status. Patient age, gender, type of malocclusion, extraction treatment, orthognathic surgery, treatment length, number of visits, and treatment efficiency index were assessed.

Results: Posttreatment PAR and ICON indices showed excellent results in all 3 groups. American Board of Orthodontics–Cast and Radiographic Evaluation was significantly higher in group C (25.3 points) than in group A (21.5 points) or group B (22.0 points) ($P = 0.014$). Patients in group A had significantly shorter treatment time (23 months) than those in either group B or C (26 months) ($P = 0.011$). Patients in group C required more appointments (27 visits) than those in either group A or B (23 and 25 visits, respectively). The treatment efficiency index showed no statistically significant difference among the 3 groups.

Conclusions: There was no difference in treatment quality among the 3 groups, as assessed by the PAR index and ICON. Jointly treated cases required 2 to 4 more visits and had higher American Board of Orthodontics–Cast and Radiograph Evaluation scores than those treated by either orthodontist. Complex cases required 6 to 7 more months when they were treated collaboratively.

Sleep-Disordered Breathing Is Associated with Reduced Mandibular Cortical Width in Children

H. Eimar H, ***MAQ Al-Saleh***, A.R. Cortes, D. Gozal, D. Graf, C. Flores-Mir.

JDR Clinical & Translational Research, 2019 Jan;4(1):58-67.

Introduction: Evidence from the adult population suggests that sleep-disordered breathing (SDB) (i.e., obstructive sleep apnea [OSA]) is negatively associated with bone mineral density. Whether a similar association exists in children with SDB has not been investigated. Using the mandibular cortical width (MCW) as a proxy for skeletal bone density, we investigated if children at risk of SDB or diagnosed with OSA have a reduced mandibular cortical width compared to children without SDB.

Methods: Two retrospective cross-sectional studies were performed. The first study included comparison of MCW between 24 children with polysomnographically (PSG) diagnosed OSA and 72 age- and sex-matched control children. The second study included a cohort of children in which SDB was suggested by the Pediatric Sleep Questionnaire (PSQ) (n = 101). MCW was measured from panoramic radiographs.

Results: Multiple-predictors regression analysis from the first study indicated that in children with a severe form of SDB, as induced by OSA severity, there was a negative association with MCW (β = -0.290, P = 0.049). Moreover, PSG-diagnosed OSA children had thinner MCW (2.9. ± 0.6mm) compared to healthy children (3.5 ± 0.6 mm; P = 0.002). These findings were further supported by the second study illustrating that PSQ total scores were negatively associated with MCW (β = -0.391, P < 0.001).

Conclusions: Findings suggest that children at risk for or diagnosed with SDB exhibit reduced mandibular cortical width that purportedly may reflect alterations in bone homeostasis.

Knowledge transfer statement: We report that sleep-disordered breathing (including its severe form, obstructive sleep apnea) in children is associated with reduced mandibular cortical width. This association might be a direct consequence of reduced bone health to sleep-disordered breathing or a reflection that reduced bone formation underlies the development of sleep-disordered breathing. Our findings suggest that mandibular cortical width can be used as an adjunct diagnostic parameter for the diagnosis of sleep-disordered breathing.

Keywords: child; cone-beam computed tomography; cortical bone; dental; mandible; sleep apnea syndromes.

Malocclusion in Saudi Arabia: A scoping review

Ziyad Abdulaziz Al Hammad, Mohammad Nasser Aldosari, Waad Tariq Aldebasi

International Journal of Applied Dental Sciences, 2019 Mar; 5(1):37-41.

Background: Malocclusion features the third highest prevalence among oral pathologies, second to tooth decay and periodontal disease and therefore rank third among worldwide dental public health priorities.

Objectives: To analyze orthodontic malocclusion in Saudi Arabia and its components including Angle classification, facial profiles, overbite, overjet, crossbite, scissor bite, crowding, spacing, and treatment needs.

Methods: The methods which were used for this review were to search in PubMed database, using specific words "Malocclusion; Angle classification; Facial profiles; Overbite; Overjet; Crossbite; Scissor bite; Crowding; Spacing; Treatment needs; and Saudi Arabia".

Results: Angle's classifications were reviewed showing Class I angle's malocclusion to be the most common type of malocclusion. Facial profiles were investigated which presented straight facial profile to be the most common type of facial profile. Overbite and overjet were revised in literature concluding the norms and abnormalities, which showed different results. Crossbite and Scissor bite were studied identifying their prevalence, which presented variable findings. Crowding and spacing were reviewed recognizing their commonness, which disclosed their high prevalence and impact. Lastly, treatment needs were investigated which presented severe or extreme need to be the most prevalent category in relevance to orthodontic treatment needs.

Conclusion: In Saudi Arabia, orthodontic malocclusion and its components were well-discussed in literature. Malocclusion showed high prevalence and impact on Saudi population.

Keywords: Malocclusion, Angle classification, Facial profiles, Overbite, Overjet, Crossbite, Scissor bite, Crowding, Spacing, Treatment needs and Saudi Arabia

Soft-and hard-tissue changes following treatment of Class II division 1 malocclusion with Activator versus Trainer: a randomized controlled trial.

Ghassan Idris, Mohammad Y. Hajeer, ***Azzam Al-Jundi***

European Journal of Orthodontics, 2019 Jan;41(1):21-28.

Background: Increased awareness on the role of oral functions in the aetiology of Class II deformities has led to the wide spread of myofunctional training appliances as easy and possibly effective treatment for children with Class II malocclusion but their efficacy is yet to be proven.

Objectives: To evaluate soft- and hard-tissue changes following 12 months of Class II division 1 treatment in growing patients with a conventional functional appliance (a modified Activator) versus a myofunctional Trainer system (T4K®).

Setting and sample population: Department of Orthodontics, Dental School.

Participants, study design, and methods: Sixty Class II division 1 children (8-12 years old) were recruited from primary schools and were distributed randomly into two equal groups. Randomization was based on a computer-generated sequence of random numbers. Data analysis included: the Activator group (28 patients, mean age = 10.6 ± 1.3 years); the T4K® group (26 patients, mean age = 10.3 ± 1.4 years). Skeletal, dentoalveolar, and soft tissues changes were assessed using standardized lateral cephalograms collected before and after 12 months of treatment. No blinding was applied in this trial.

Results: Improvement in the Class II skeletal and dentofacial characteristics were significantly greater in the Activator group when compared with the T4K® group. The improvement was evident in a significant decrease in the skeletal angle ANB with Activator ($\bar{x}$ = -1.89 ± 1.12) compared to T4K® ($\bar{x}$ = -0.9 ± 1.01) (P = 0.01), a significant greater increase in the facial convexity angle with Activator ($\bar{x}$ = 2.61 ± 3.71) more than T4K® ($\bar{x}$ = 0.2 ± 2.51) (P = 0.04), and a significant reduction in the overjet ($\bar{x}$ = -3.0 ± 2.3 mm) compared to ($\bar{x}$ = -1.5 ± 1.9 mm; P = 0.01) with Activator versus T4k®, respectively (P = 0.001).

Limitations: This study was a short-term study (12-month follow-up).

Conclusions: The results of the current study indicated that the Activator was more effective than the T4K® in treating Class II division 1 growing patients.

Evaluation of facial appearance in patients with repaired cleft lip and palate: comparing the assessment of laypeople and healthcare professionals

Samar Alhayek, Mohammed Alsalem, Yazeed Alotaibi, Aamir Omair

Maxillofacial Plastic and Reconstructive Surgery, 2019 Feb; 41(1):5.

Background: The present study aimed to determine whether laypeople and professionals rate the facial appearance of individuals with repaired complete unilateral or bilateral cleft lip and palate (UCLP, BCLP) similarly based on viewing full facial images.

Methods: The study followed a cross-sectional analytical design where five young patients aged 10 to 14 years, who had completed all stages of their unilateral or bilateral cleft lip and palate treatment (bilateral: three, unilateral: two), were evaluated by two groups. The assessment was done by laypeople and 97 qualified professionals (33 orthodontists, 32 plastic surgeons, and 32 oral and maxillofacial surgeons). Professionals were not involved in any stage of the patients' treatment.

Results: The facial appearance assessment of the professional groups on different facial aesthetics was significantly lower than that of laypeople, and they had higher perceived need for further treatment. On the other hand, laypeople had higher aesthetic ratings and lower perceived need for further treatment. Differences were also observed between the assessments of the professional groups. Participants who had lower aesthetic assessments of the repair tended to report a higher influence of cleft lip and palate on social activities and professional life.

Conclusion: Differences in perception exist between healthcare professionals and laypeople. The discrepancies between the professional groups could be attributed to different treatment modalities and protocols.

Keywords: Assessment; Cleft lip palate; Facial appearance; Laypeople.

Prevalence and Factors Associated with Dentofacial Characteristics of Malocclusion among Saudi Adults: A Cross-sectional Study

Abed Al-Hadi Hamasha, Hind A. Alfehaid, Nouf A. Alqahtani, Sarah A. Alhusseini, Rasha A. Alomar, Nouf A. Almayouf, Norah F. Aljuhaimi, Atheer A. Almasoud

International Journal of Medical Research & Health Sciences, 2019 Nov;8(11): 23-31.

Objectives: The study aimed to explore the prevalence of malocclusion characteristics in Saudi adults.

Methods: A cross-sectional study was designed to examine 350 adult patients attending King Abdulaziz Medical City of the National Guard Health Affairs. Data were obtained by self-reported questionnaires and clinical dental examinations. Questionnaires comprised of sociodemographic and oral habits. The clinical dental examination was based on the Basic Methods of the World Health Organization criteria for dentofacial anomalies (1997). Statistical analyses included descriptive statistics, chi-square tests, and binary logistic regression analysis.

Results: Regarding oral habits; 6% reported thumb sucking, 11% tongue thrusting, 42% mouth breathing and 5.7% had speech problems. The prevalence of dentofacial characteristics of malocclusion was found as follows: 41.5% had crowded in the anterior teeth, 31.4% had spacing in the anterior teeth, 16.6% had Diastema, 49.7% had teeth irregularities, 42.5% had overjet, 18.3% had anterior crossbites and 31.1% had anterior open bite. The risk indicators for crowding were age and gender; for spacing were education, tongue thrusting, and speech problem; for Diastema was education; for teeth irregularities was mouth breathing; and for crossbite were thumb sucking, tongue thrusting and mouth breathing. No risk indicators were associated with anterior overjet and open bite.

Conclusion: The prevalence of dentofacial characteristics of malocclusion ranged from 17-50%. The prevalence of oral habits that might cause malocclusion varied from 6% to 44%. Age, gender, education, tongue thrusting, speech problem, mouth breathing; and thumb sucking were risk indicators for malocclusion characteristics.

Keywords: Characteristics, Dentofacial, Malocclusion, Prevalence, Saudi

Patterns of Dental Anomalies in Patients Attending for Orthodontic Treatment in King Abdul-Aziz Medical City, Riyadh Saudi Arabia

Tariq Alswayyed, Manal Al Qutub, Abeer Al Matrodi, Nourah AlKanani, Nouf ALJhany, Lamya Makhdoum, Nazish Masud

International Journal of Dentistry and Oral Health, 2018 Mar;4(2):8-13.

Abstract: The aim of this was to investigate the patterns of dental anomalies and treatment options among orthodontic patients in king Abdul-Aziz medical city (KAMC) Riyadh, Saudi Arabia. Method: This cross-sectional study, chart review was conducted in King Abdul-Aziz Medical City (KAMC) in a period of time between 2016 to June 2017 in out patient's orthodontic clinic. Two hundred and ninety-nine (299) patients' files were reviewed for both Digital Orthopantographs (OPG) and dental records. These records were reviewed for congenitally missing teeth (hypodontia), supernumerary teeth, impactions, transposition, infraposition, and any other unusual conditions that can be assessed with OPG. Treatment options were divide into (fixed orthodontics appliance, surgical, restorative, combination treatment or follow up) according to the orthodontists' notes. (SPSS) version 24.0 was used to analyze the data. Result: The most common finding of dental anomalies was hypodontia (33.78%), impaction (29.1%), retained primary teeth (7.02%), infraposition (2.68%), respectively. The least anomalies were transposition (0.33%) and supernumerary teeth (0.33%). Other findings anomalies represented by (2.68%) such as (peg-shaped laterals, Microdontia, or dilacerations teeth.

Keywords: Dental Anomalies, Orthodontic Treatment, Hypodontia, Impaction, Retained Primary Teeth, Infraposition, Supernumerary, Peg Shaped Laterals

Efficiency of Er: YAG utilization in accelerating deep bite orthodontic treatment

Azzam Al-Jundi, Salah Sakka, ***Hicham Riba***, Thaer Ward, Reem Hanna

Laser Therapy, 2018 Sep;27(3):193-202.

Background and aims: The long duration of orthodontic treatment is a major patients' concern. A noninvasive method of accelerating tooth movement in a physiological manner is needed. The aim of the study was to evaluate the effects of Er:YAG laser application during orthodontic treatment of deep bite and to evaluate its analgesic effect during that movement.

Materials and methods: A prospective randomized controlled clinical trial (RCT) was performed on 30 patients with deep bite. Sample was divided into two groups: (A), 15 patients (orthodontic treatment-control group) and (B), 15 patients (orthodontic treatment and Er:YAG Laser - laser group). The tooth movement was evaluated as the primary outcome variable by measuring angular and linear changes on three progress lateral cephalometric radiographs (T1, T2 and T3); Lateral cephalograms were taken before treatment (T1), immediately after finishing the stage of leveling and alignment (T2) and after completion of the intrusion stage (T3).

Laser parameters were 400 mJ/10 Hz/4 W and 400 mJ/15 Hz/6 W, depending on the handpiece used. The levels of pain and discomfort were evaluated and ranked according to a visual analog scale. Paired t-tests or Wilcoxon matched-pairs signed-rank tests were used to detect significant differences.

Results: The main findings of the treatment were (1) significant positive difference in the rates of tooth intrusion movement on the experimental group compared with the control group at the baseline to T2 and T3 interval and the tooth movement rate was approximately 3 times faster in the experimental group. (2)

The pain score in the experimental group was significantly lower compared with the control group on day 3 as on day 7.

Conclusion: The application of Er:YAG laser is an effective mean to speed orthodontic tooth movement with a significant reduction in pain and discomfort after application.

Keywords: Er:YAG, deep bite, orthodontic treatment

Measurement accuracy of space analysis by smart phone applications for orthodontic purposes: a comparison study with conventional plaster dental models

Reem Sami Alwakeel, Mohammed Awawdeh, Deena Mahmoud Barakah

International Journal of Applied Dental Sciences, 2018 Sep;4(3):314-322.

Introduction: Our objective is to assess how accurate and valid the measurement estimates made by smartphone apps programs are on photos taken by smartphone digital camera when compared to those obtained from plaster models.

Method: A set of several alginate impressions was taken from siblings with different types of occlusion. A written consent form were taken from all of the participants. Each impression was made into a plaster cast and photos were taken by smartphone digital camera. Direct photos were also taken of siblings' dentition. Different mobile apps software programs that are currently available for both Iphone and Android OS smartphones were then used to measure the photos of the tooth widths at their greatest mesiodistal dimension and arch length. Tooth and arch widths were again physically measured on the plaster models with a divider and a millimeter ruler.

Result: When comparing measurements estimated from the smartphone photos, obtained through different measuring smartphone apps, with those of the conventional plaster dental study models, we found that there was no significant difference in space analysis between them. For the photos taken directly from the patients' mouths, there was a slight significant difference (0.1mm) in the spacing and crowding estimates.

Conclusion: The measurement accuracy obtained through smartphone apps and photos for dental space analysis evaluation is clinically acceptable. Their measurement estimates are virtually identical to their counterparts in the traditional plaster study models. Overall, smartphone apps digital photo measurements are as reliable as traditional plaster models measurement in accuracy.

Keywords: Dental casts, space analysis, digital study models, smartphone dental apps; digital orthodontic measurement

Orthodontic with Miniplates in the Correction of an Adult Case with Class II Malocclusion and Anterior Open Bite

Ali S. Aljhani, Maryam Alhindi, Khalid H. Zawawi

International Journal of Oral and Dental Health, 2018 Sep; 4(2):1-6.

Abstract: This case report illustrates an orthodontic treatment of a 23-year-old female patient presented with an Angle Class II malocclusion, open bite, bimaxillary dental protrusion and incompetent lips with the aid of titanium miniplates. After extraction of her maxillary first bicuspids and mandibular second bicuspids, fixed pre-adjusted bi-dimensional Edgewise appliances were placed. After alignment, titanium miniplates

were surgically placed into the zygomatic buttresses bilaterally. Anterior retraction and intrusion, as well as posterior intrusion were performed. Treatment time was 20 months. Cephalometric superimpositions showed favourable maxillary molar intrusion and mandibular autorotation. Open bite was corrected and class I molars and canines with ideal overjet were achieved with a significant improvement on appearance. Orthodontic treatment with miniplates is an effective technique in open bite cases with vertical problems.

Keywords: Temporary anchorage devices, Miniplates, Orthodontic tooth movement, Intrusion, Bimaxillary protrusion

Your Journey with Orthodontics. (Arabic Book) رحلتك مع تقويم الأسنان والفكين،الطبعة الأولى

Nasir Al Hamlan (الهملان،ناصربن حمد) Alshegrey; 2018

No Abstract.

Pattern of Malocclusion in a Sample of Orthodontic Patients from a Hospital in the Kingdom of Saudi Arabia

Azzam Al-Jundi, Hicham Riba

Savant Journal of Medicine and Medical Sciences, 2015 Jan;1(1):14-21.

Background: Malocclusion can present itself in numerous ways. It is present in every society, but the norms and pattern vary. In order to correct occlusal disharmony, it is imperative to identify its pattern in the population so that proper resources can be directed toward its diagnosis and treatment planning. The aim of this study was to determine of skeletal and dental malocclusion in a sample of Saudi orthodontic patients.

Material and Methods: To achieve this, dentofacial characteristics of 510 patients from September 2013 to May 2015 were analyzed and tabulated. Both male and female were included in this study. Different cephalometric values were used to evaluate the type of malocclusion. Casts were analyzed to record the patient's dental classification.

Results: Molar Class II malocclusion was the most frequent, whereas class III subdivision the least frequent. Statistically significant difference was observed in normal overjet, overbite, crossbite, slight midline deviation, ANB, NL/ML, NSL/ML, according to gender and between the hypodivergent and hyperdivergent groups, and between ANB, AOBO in the skeletal class I and class II group.

Conclusion: the results give a detailed pattern of malocclusion in orthodontic patients and may provide a baseline data for planning orthodontic service. Class II Saudi patients have a higher motivation for orthodontic therapy. Statistically significant difference was found between vertical and sagittal angles.

Keywords: Malocclusion, Dentofacial characteristics, Orthodontic patients.

Orthodontic Treatment and Referral Patterns: A Survey of Pediatric Dentists, General Practitioners, and Orthodontists

Abdulah M. Aldrees, Nada E. Tashkandi, Areej A. AlWanis, Munerah S. AlSanouni, ***Nasir H. Al-Hamlan***

The Saudi Dental Journal, 2015 Jan;27(1):30-39.

Objective: This study aims to assess the orthodontic diagnostic skills, referral patterns, and the perceptions of orthodontic benefits of pediatric and general dentists in comparison with orthodontists.

Materials and methods: Two online surveys were e-mailed to pediatric dentists, general dentistry practitioners, and orthodontists registered as members of the Saudi Dental Society and the Saudi Orthodontic Society. The surveys included questions about the type of orthodontic treatment provided, referral trends, and timing; presumed benefits associated with successful orthodontic treatment; and diagnosis and treatment plans of seven cases representing different malocclusions.

Results: In total, 25 orthodontists, 18 pediatric dentists, and 14 general practitioners completed the survey. Only 38.8% of pediatric dentists and 7.1% of general practitioners reported that they practiced orthodontics clinically. The perceptions of the three groups toward the benefits of orthodontic treatment were comparable in the psychosocial areas. However, the orthodontists perceived significantly lesser effects of orthodontic treatment on the amelioration of temporomandibular disorder (TMD) symptoms. Pediatric dentists tended to rate the need and urgency of treatment higher, while general practitioners tended to rate the need of treatment lower. The selected treatment plans for three early malocclusion cases showed the greatest discrepancies between the orthodontists and the other two groups.

Conclusions: The orthodontists consistently and significantly downplayed the perceived benefit of orthodontic treatment to reduce TMD symptoms. Also, while there was a similarity in the diagnosis, there were notable differences in the proposed treatment approaches, perceived treatment need, and timing of intervention between the three groups of practitioners.

Keywords: Orthodontist, Pediatric dentist, General practitioners, Perception, Knowledge

Correlation of Dental and Skeletal Malocclusions in Sagittal Plane among Saudi Orthodontic Patients

Nasir Al-Hamlan, Balsam Al-Eissa, Ahmad S. Al-Hiyasat, Farraj S. Albalawi, Anwar E. Ahmed

The Journal of Contemporary Dental Practice, 2015;16(5):353-359.

Aim: Whether or not the dental relationship correlates with skeletal relationship in the sagittal plane is an area of interest for orthodontic diagnosis and treatment planning. Thus, the aim of this study was to investigate the correlation of the dental malocclusion and the skeletal malocclusion in the sagittal plane among Saudi orthodontic patients.

Materials and methods: Orthodontic dental casts and cephalometric radiographs of 124 patients were investigated and analyzed. The dental casts were classified in relation to the molar relationship according to Angle's classification and to the incisal relationship according to the British Standards Institution (BSI) classification. The sagittal relation in the cephalometric radiographs was analyzed according to ANB angle and WITS appraisal.

Results: The results show that the incisal relation had a very high significant association with WITS appraisal ($p = 0.0045$), whereas with ANB, the association was marginally significant ($p = 0.0528$). No significant associations were found with molar relation neither at ANB ($p = 0.2075$) nor at the WITS ($p = 0.4794$) appraisal. Significant positive correlations between ANB and WITS appraisal were found at the three incisal classification classes (class I, $r = 0.73$; class II, $r = 0.64$; class III, $r = 0.75$) and no significant correlation was observed in all classes with the Angle's (molar) classification.

Conclusions: The incisal classification had a significant association with WITS appraisal, whereas with ANB the association was marginally significant. No correlation was found between Angle's (molar) classification and ANB or WITS appraisal.

Clinical significance: The incisal relation could be considered as a good indicator of the skeletal malocclusion in the sagittal plane in the orthodontic practice.

Keywords: Dental malocclusions; Skeletal malocclusions; Sagittal plane.

Is arch form influenced by sagittal molar relationship or Bolton tooth-size discrepancy?

Abdullah M. Aldrees, Abdulmajeed M. Al-Shujaa, Mohammad A. Alqahtani, ***Ali S. Aljhani***

BMC Oral Health, 2015 Dec; 15:70.

Background: Orthodontic patients show high prevalence of tooth-size discrepancy. This study investigates the possible association between arch form, clinically significant tooth-size discrepancy, and sagittal molar relationship.

Methods: Pretreatment orthodontic casts of 230 Saudi patients were classified into one of three arch form types (tapered, ovoid, and square) using digitally scanned images of the mandibular arches. Bolton ratio was calculated, sagittal molar relationship was defined according to Angle classification, and correlations were analyzed using ANOVA, chi-square, and t-tests.

Results: No single arch form was significantly more common than the others. Furthermore, no association was observed between the presence of significant Bolton discrepancy and the sagittal molar relationship or arch form. Overall Bolton discrepancy is significantly more prevalent in males.

Conclusions: Arch form in a Saudi patient group is independent of gender, sagittal molar relationship, and Bolton discrepancy.

Keywords: Bolton discrepancy, Arch form, Angle class

The Effect of Orthodontic Therapy on Periodontal Health: A Review of the Literature

Samah Alfuriji, Nora Alhazmi, Nasir Alhamlan, Ali Al-Ehaideb, Moatazbellah Alruwaithi, Nasser Alkatheeri, ***Amrita Geevarghese***.

International Journal of Dentistry, 2014 May;2014(585048):1-8.

Objectives.This review aims to evaluate the effect of orthodontic therapy on periodontal health. Data. Original articles that reported on the effect of orthodontic therapy on periodontal health were included. The reference lists of potentially relevant review articles were also sought.

Sources. A literature search was conducted using the databases, Medline, EMBASE, Cochrane Library, Web of Science, Google Scholar, and Scopus databases for relevant studies. The search was carried out by using a combined text and the MeSH search strategies: using the key words in different combinations: “periodontal disease,” “orthodontics” and “root resorption.” This was supplemented by hand-searching in peer-reviewed journals and cross-referenced with the articles accessed. Articles published only in English language were included. Letters to the Editor, historical reviews and unpublished articles were not sought.

Conclusions. Within the limitations of the present literature review, it was observed that there is a very close inter-relationship between the periodontal health and the outcome of orthodontic therapy.

Periodontal Health Status of Saudi Patients Undergoing Orthodontic Treatment

Azzam Al-Jundi

International Arab Journal of Dentistry, 2014 Aug;392(3560):1-8.

Abstract: The growing awareness about dental aesthetics and functionality in the general population has led to more and more people seeking orthodontic treatment. The patient's ability to achieve and maintain good overall oral hygiene and prevent periodontal disease is fundamental while under-going orthodontic treatment. This study was done to evaluate the periodontal health status of Saudi patients scheduled for fixed orthodontic treatment. Fifty patients (12-26 years old) were selected from orthodontic clinics of King Abdul-Aziz Medical City of National Guard, Riyadh, Saudi Arabia. The periodontal health status of the patients was evaluated using the plaque index (PI), the orthodontic plaque index (OPI) and the gingival bleeding index (GBI). These indices were determined prior to the placement of fixed appliances, after 6 months and after 12 months of the beginning of the orthodontic treatment. Results showed that PI and OPI were high with mean scores of 65.24 ± 16.43 for PI and 53.56 ± 8.74 for OPI, while the average GBI scored a much lower value of 19.14 ± 7.95. After 6 months of treatment, the probing pocket depth at the first molars was 1.5-2.0 mm. In some severe cases it exceeded 3mm. After 12 months of treatment, the probing pocket depth was greater than that observed at 6 months and it mostly fell in the range of 2.0-2.5mm. No significant differences were observed between male and female patients for the PI (p=0.925) and for OPI (p=0.072); However, a significant difference was observed for the GBI (p=0.033). Thus it was concluded that plaque deposition during orthodontic treatment can promote periodontal inflammation and destruction. Oral hygiene measures, patient education and motivation can help maintain oral hygiene and minimize the hazardous effects of orthodontic treatment on periodontal tissues.

Keywords: Plaque index - bleeding index - probing pocket depth – gingivitis - oral hygiene - fixed orthodontics

Does Alveolar Corticotomy Accelerate Orthodontic Tooth Movement when Retracting Upper Canines? A Split-Mouth Design Randomized Controlled Trial

Fadi Al-Naoum, Mohammad Y. Hajeer, ***Azzam Al-Jundi***

Journal of Oral and Maxillofacial Surgery, 2014 Oct;72(10):1880-1889.

Purpose: To evaluate the efficacy of alveolar corticotomy on orthodontic tooth movement when retracting upper canines compared with the conventional technique and to evaluate patients' pain and discomfort levels after corticotomy.

Materials and methods: A split-mouth design randomized controlled trial at the Department of Orthodontics (University Al-Baath Dental School) was performed. A total of 30 patients whose orthodontic treatment required canine retraction were included. The predictor variable was the use of corticotomy to facilitate tooth movement. The velocity of space closure was evaluated as the primary outcome variable by measuring the distance between the canine and first molar on each side of the mouth immediately after corticotomy and at 1, 2, 4, 8, and 12 weeks after corticotomy. The levels of pain and discomfort were evaluated as the secondary outcome variables using a questionnaire administered 4 times during the first

week after corticotomy. Paired t tests or Wilcoxon matched-pairs signed-rank tests were used to detect significant differences.

Results: A total of 30 patients (15 males and 15 females) were recruited with a mean age of 20.04 ± 3.63 years (range 15 to 24). The space closure velocity after corticotomy was significantly faster on the experimental side than on the control side (mean = 0.74 mm/week vs 0.20 mm/week between 1 week after and immediately after corticotomy, respectively; P < .001). The pain encountered during eating was high, with 50% and 30% of patients reporting severe pain at 1 and 3 days postoperatively, respectively. No significant differences were detected between the male and female patients regarding the tooth movement velocity on the experimental side.

Conclusions: Alveolar corticotomy increased orthodontic tooth movement and was accompanied by moderate degrees of pain and discomfort.

Characteristics of Craniofacial Complex for Class II Division 1 Malocclusion in Saudi subjects with permanent dentition

Azzam Al Jundi, Hicham Riba

Global Journal of Medical Research, 2014 Dec; 14(6):1-9.

Abstract- European-American norms are still used in the orthodontic treatment of Saudi patients, despite the different ethnic backgrounds of Saudis. The aims of this study were to evaluate the Cephalometric features of Class II division 1 in Saudi adult patients and to compare these values with those features of normal occlusion by referring to the effect of the gender on these values. Ninety-four (94) Saudi patients were evaluated Cephalometrically and distributed into two groups where the first group comprised of (45) subjects with normal occlusion. The second group comprised of (49) subjects with Class II division 1. Wide variations were observed for almost all measurements of Class II division 1. However, a posteriorly positioned mandible and shortness in its dimensions were noticed.

Keywords: class ii division1, cephalometric evaluation, dento skeletal morphology

Assessment of Pain and Discomfort During Early Orthodontic Treatment of Skeletal Class III Malocclusion Using the Removable Mandibular Retractor Appliance

M Saleh, Mohammad Y. Hajeer, ***Azzam Al-Jundi***

European Journal of Paediatric Dentistry, 2013 Jun;14(2):119-124.

Aim: To determine the degree of pain and discomfort during the orthodontic treatment of skeletal Class III malocclusion using the Removable Mandibular Retractor (RMR).

Materials and methods: The sample consisted of 33 skeletal Class III patients (17 males and 16 females; average age: 7.5 ± 1.33 years) who had been assigned to the RMR treatment group in a randomised controlled trial comparing this treatment versus a control group of no treatment at the Orthodontic Department, University of Al-Baath Dental School in Syria. Pain and discomfort were assessed using standardised questionnaires at the following assessment times: 7 days (T1), 14 days (T2), 6 weeks (T3), 3 months (T4) and 6 months (T5) after appliance insertion.

Results: Levels of pain and discomfort decreased gradually by time in general. No significant changes in the levels of pain, tooth sensitivity and soft tissues tension were detected, whereas a significant decrease in the levels of pressure, impaired speech, impaired swallowing and lack of confidence in public was

observed two weeks following appliance insertion. Mandibular constraint feeling required three months to decrease significantly. No difference was found between males and females with regard to acceptance.

Conclusion: The RMR is well accepted by Class III patients in the early mixed dentition.

Keywords: Acceptance, Discomfort, Pain, Questionnaire, Removable Mandibular Retractor

Evaluation of the Treatment Results Achieved in Orthodontic Patients (Book).

Feras Al-Khayyal.

LAP Lambert Academic Publishing, (ISBN:978-3659333828), 2013; 56p

Summary: Objective treatment outcome measures of many medical, and dental therapies are difficult to obtain because the detailed results of treatment are frequently not well documented. Fortunately, orthodontics is somewhat unique in that Orthodontists record the result of their treatment with a variety of diagnostic records that include study casts, photographs, radiographs and measures that evaluate the important elements of treatment outcomes. The aim of this retrospective study was to use the PAR index to assess the orthodontic treatment outcomes in a group of 50 cases treated by residents in the Orthodontic Department at the University at Buffalo.

Nonextraction Treatment of Severe Crowding with the Aid of Corticotomy-Assisted Orthodontics

Ali S. Aljhani, Khalid H. Zawawi

Case Reports in Dentistry. 2012;2012.694527:1-8

Abstract: This paper illustrates the combined nonextraction orthodontic treatment with the corticotomy technique in an adult patient (age: 25 years and 3months) with severely crowded arches to accelerate toothmovement and shorten the treatment time. Both her upper lateral incisors were congenitally absent and both upper central incisors' roots were short. Initial fixed orthodontic appliances (bidimensional) were bonded and one week later buccal and lingual corticotomy with alveolar augmentation procedure in the maxilla and mandible was performed. Orthodontic activation to level and align and unravel the crowding was performed every two weeks. The total treatment time was 8 months with no adverse effects observed at the end of active treatment. The addition of the decortication procedure to the conventional orthodontic therapy decreased the duration of treatment significantly. Successful alignment of both arches with ideal overbite and overjet as well as adequate occlusion was achieved.

Pediatric Dentistry

2.8 PEDIATRIC DENTISTRY

Knowledge and attitudes toward child abuse and neglect among medical and dental undergraduate students and interns in Riyadh, Saudi Arabia

Vidyullatha Gopalakrishna, Bahija Basheer, Afnan Alzomaili, Atheer Aldaham, Ghaida Abalhassan, Hend Almuziri, Maha Alatyan, Mona AlJofan, Reem Al-Kaoud.

Imam Journal of Applied Sciences, 2020;5(1):38-46.

Background: Child abuse and neglect (CAN) is a major problem around the world including Saudi Arabia. According to National Family Safety Program registry, most of cases of CAN in Saudi Arabia are detected in hospitals. Hence, healthcare professionals play an important role in identifying and reporting suspected cases of CAN. The purpose of the study is to assess knowledge and attitudes toward CAN among medical and dental undergraduate (UG) students and interns in Riyadh.

Materials and Methods: This cross-sectional study distributed a self-administrated structured questionnaire to 351 medical and dental UG students and interns in different public and private medical and dental colleges in Riyadh. Participants were recruited using convenient sampling. The data were entered using IBM SPSS version 22 software. Descriptive statistics (frequency distribution), Chi-square test, and *t*-test were used to perform the statistical analysis. The significance level (*P* value) was set at <0.05.

Results: About 57.5% of the participants reported having formal training on CAN during their UG study. Mean knowledge score related to CAN was 6.81 ± 1.17 for medical participants and 6.35 ± 1.35 for dental participants, and the difference was statistically significant (*P* = 0.001). Majority of the participants believed that the main barrier for not reporting a suspected case of CAN is the fear of consequences (medical = 82.4%, dental = 68.5%, *P* = 0.01). About 77% of the participants agreed to the need for further training in dealing with suspected cases of CAN.

Conclusion: This study showed that dental participants had relatively less knowledge about the clinical presentation of CAN than medical participants. Improvements in the educational system are still needed to raise awareness about this issue. Inclusion of case scenarios and problem-based learning may help retain knowledge acquired during training. To increase awareness about the diagnosis and referral procedures, academic institutes should consider continuous educational courses and seminars.

Keywords: Child abuse and neglect, dental students, knowledge and attitude, medical students

Prevalence of Malocclusion in Saudi Arabia Children: A Literature Review

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EC Dental Science, 2020;19(1):1-6.

Abstract: There is a wide range of reported prevalence of malocclusions in Saudi Arabia, which reflects variations in study populations with respect to ethnicity and age and also lack of conformity of methods of registration. Age has an impact on the prevalence of different malocclusions. We performed an extensive

literature search of the Medline, Cochrane, and EMBASE databases on the 1st of October in 2019 using the medical subject headings (MeSH) terms “Malocclusion” AND “Saudi Arabia”. Papers discussing the prevalence of malocclusion among Saudi children were screened for relevant information. The search date was limited to the last 10 years to get the most updated evidence. Class I molar, canine, and incisal relationships was a dominant feature among Saudi children. Crowding was the most prevalent malocclusion trait, followed by spacing and overbite. Dental trauma, oral hygiene, and oral habits (e.g. digit sucking) are important factors to predict malocclusion prevalence. These findings will help in understanding the occlusion status in order to plan for prevention and treatment of malocclusion among Saudi children.

Keywords: Malocclusion, Saudi Arabia, Children

Oral hygiene practices, dietary habits and dental caries experience among primary children in Riyadh, Saudi Arabia: A cross-sectional study

Bahija Basheer, Saleh Aloufi, Azzam Almeshrafi, Nawaf Alkubedan, Khaled Aldalaan, Abdulelah Alobathani, Abdulmalek Alhamed, Faisal Alsaif, Nawaf Alshahrani, Raed Alshehri.

Medical Science, 2020 Mar:24(102): 960-967.

Background and Aim: Dental caries is a preventable disease; however, public health efforts are hampered due to limited information on associated factors in vulnerable populations. Our study aimed at estimating and assessing dental caries prevalence and experience and identifying key risk factors in association with oral health practices and dietary habits among primary school children living in Riyadh, Saudi Arabia.

Methods: 355 male and female Saudi primary school children aged 6–9 years participated in this crosssectional study. The study was conducted using a 31-item self-administered questionnaire followed by oral examination to assess the caries experience. SPSS software version 22 was used for data analysis.

Results: The severity of caries prevalence was different depending on the type of teeth whether deciduous or permanent. For deciduous teeth 52.1% had caries, while permanent teeth had 82.5%. All in all, the DMFT score was 1.19±1.43 and the def was 3.74±1.43. Multiple individual factors were significant particularly when are compared to caries seen in deciduous teeth.

Conclusion: Dental caries were more prevalent in primary school children, and individual factors were predominantly associated with the disease.

Keywords: Dental caries, Primary school children, Prevalence, Diet, oral hygiene practices

Knowledge of Tooth Avulsion Management Among Emergency Room Physicians in Saudi Arabia

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Bioscience Biotechnology Research Communications, 2020 Mar;13(1):219-224.

Abstract: Tooth avulsion is the displacement of an intact tooth out of the bony socket. This study evaluates the knowledge of Emergency Room physicians about tooth avulsion management, and determine the demographic factors associated with knowledge. A cross-sectional observational study was conducted on ER physicians. Major public hospitals were conveniently selected and used as clusters; test subjects were conveniently approached. Data were collected through a validated, self-administered questionnaire. Levels of knowledge were assessed in certain fields of avulsion management through selected questions. A total of 244 medical practitioners in emergency departments participated in the study. When asked about the importance of immediate management and critical extra-alveolar time of avulsed teeth, 35.4% of the respondents responded correctly. As for the importance of not replanting primary teeth, 46.3% of the respondents reported correctly. The majority of physicians knew the proper handling and proper cleaning technique of avulsed teeth with 78.5% and 79.3% correct responses respectively. The overall knowledge levels of physicians were poor in 61% and only 39% showed good knowledge. Results showed that ER physicians have demonstrated poor knowledge level regarding tooth avulsion management. Therefore, training programs would be helpful for timely dental referral of the patient presented with tooth avulsion in ER.

Keywords: Dental trauma, emergency, physicians, tooth avulsion

Pattern of dental treatment of children under outpatient general anesthesia in children: A 6-year retrospective study in Saudi Arabia

Sharat Chandra Pani, ***Reem AlKaoud, Ghaida AlMoqbel, Azzam AlMeshrafi***, Shahad Binateeq, Saleh Sonbol.

Saudi Journal of Oral Sciences, 2020 May-Aug;7(2):80-84.

Background and Aim: This study aimed to assess the pattern of cases and types of dental procedures performed in an outpatient general anesthesia (GA) operatory.

Methodology: A retrospective observational study design was used. The sample comprised of children aged between 2 and 14 years of age (285 males and 267 females) who received dental treatment under GA from April 2013 to March 2019 and whose parents consented to review of dental and medical records. The American Society of Anesthesiologists (ASA) status of patient on admission, presence or absence of complications from the anesthesia, and type of dental procedures carried out in primary and permanent teeth were recorded and subjected to statistical analyses.

Results: Nearly 90% of the cases treated were ASA I (*n* = 498), with only four cases that were classified as being above ASA III. The mean number of teeth treated per child was 10.6 (standard deviation ± 3.89) teeth. There was a gradual reduction in mean number of teeth treated from 2013 to 2018. There were no cases of serious complications of GA or delayed postoperative recovery reported over the 6-year period.

Conclusions: Outpatient surgery is an effective means of providing dental care under GA, even for children with mild systemic disorders.

Keywords: Behavior management, dental rehabilitation, general anesthesia

Comparison of Survival Rates of Stainless-Steel Crowns Placed with and without Pulpotomy: A Two-Year Retrospective Study

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International Journal of Dentistry, 2020 Oct; 2020:8883189.

Aim: This study aimed to retrospectively compare the survival outcomes over two years between teeth with proximal dental caries that were restored with stainless-steel crowns to those that were pulpotomized and then restored with a stainless-steel crown in patients who were rehabilitated under general anesthesia.

Participants and Methods: The records of 131 patients aged between two to six years who had stainless-steel crowns placed under general anesthesia and had two-year follow-up were screened. 340 teeth with moderate proximal caries on the radiograph (D2) were included in the study. Of these, 164 teeth were treated with a pulpotomy and stainless-steel crown, while 176 teeth were crowned without a pulpotomy. The type of each tooth was compared using the Chi-squared test and Kaplan–Meier survival analysis, and curves were plotted based on the two-year outcomes.

Results: Treatment, the sample comprised 59 males (mean age 4.73 years, SD ± 1.4 years) and 72 females (mean age 5.2 years, SD ± 2.0 years). The Kaplan–Meier regression model showed no significant difference in survival outcomes between teeth that had been pulpotomized and those that had not (P = 0.283).

Conclusion: Within the limitations of the current study, we can conclude that performing a pulpotomy does not influence the survival outcome of mild/moderate proximal caries restored with stainless-steel crowns under general anesthesia.

The Experience of Pediatric Patients Undergoing Dental Rehabilitation Under General Anesthesia in King Abdulaziz Medical City, Riyadh, Saudi Arabia

Yasir Bin Ahmed, Yousef Kareem, Nouf Almunaiseer, Mohammed Aldosari, Yazeed Alturki

CPQ Medicine, 2019 Jan; 5(3):1-14.

Introduction: Caries is the most common chronic disease of children worldwide. General anesthesia is used to provide high quality of treatment and full mouth rehabilitation for dental patients when conventional ways failed.

Aim: To assess the child and their families experience about health service provided throughout the pathway of care for dental rehabilitation under general anesthesia.

Methods: An interview questionnaire from the children guardian at the day of general anesthesia at KASC followed by a phone call interview done two weeks later. Questionnaire was conducted to the parents based on current literature review with the addition and modification of questions related to the Saudi Arabian community and culture. Open and closed questions were used in the interview to collect data verbally from the children's' guardians at the day of general anesthesia at King Abdullah Specialized Children's' Hospital (KASCH).

Results: 59.7% of children are still in pre-school age. Majority of the guardians 58% were fathers and only 33.3% of the guardians have bachelor degree or above. Around 10% of the patients had previous GA and 19.5% had siblings had previous treatments done under GA. Most of the children were referred from KAMC 44.4%. Very young uncooperative child was the most reason for referral 43.1%. The waiting period from referral to dental rehabilitation under GA treatment was mostly more than 6 months 61.1%. 83% of the families take their children to the dentist's office only for emergency treatments. 81.9% of the patient experienced tooth pain during the waiting period. The most previous preventive care that the children had professionally was brushing advise 48.6% followed by avoid sugary intake 11.1%. 52% of the children do not brush their teeth. 52.8% of the guardians reported searching oral health information from the internet. The most media used by the children was television 47.2% followed by tablets 23.6%, smart phones 19.4%, and computers 4.2%. 48{Abanto, 2014 #51}.6% of guardians prefer having professional dental

health prevention. Headache 11.1% was the most common complication after GA followed by vomiting 4.2% and bleeding from the nose 1.4%. A high satisfaction response was reported from the guardians 93.1% regarding the pathway and treatment. 94.4% of the children had preventive care programs after GA.

Conclusion: Based on the finding many AAPD and DOH recommendations for promoting oral health are not met. Greater effort should be done to increase the public awareness about dental caries and its prevention.

Keywords: Dental Rehabilitation; General Anesthesia; Dental Caries

Early childhood caries and infant's oral health; pediatricians' and family physicians' practice, knowledge and attitude in Riyadh city, Saudi Arabia

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The Saudi Dental Journal, 2019 Feb; 31(Supplement):96-105.

Background: Early childhood caries (ECC) is a significant worldwide oral health problem. However, parents do not take their children to the dentist for regular screening of oral diseases as early as they do with pediatricians and family physicians. As a result, pediatricians and family physicians are considered as a reliable and perfect source for children's oral health promotion and disease prevention. Studies assessing pediatricians' and family physicians' practice, knowledge and attitude regarding ECC and infant's oral health in Saudi Arabia are few. As a result, this study aimed to assess these aspects.

Methodology: A cross-sectional study based on a structured close-ended questionnaire was conveniently distributed among pediatricians and family physicians in Riyadh city, Saudi Arabia. The questionnaire composed of two main sections; demographic characteristics and questions assessing participants' practice, knowledge and attitude. The data was analyzed using SAS software, frequency and chi-square test were conducted, and P-value of <0.05 and less was considered significant.

Results: There was a discrepancy between the participants' knowledge, attitude and practice. The participants' practice was lower (42.6%) compared with their attitude (86.1%) and knowledge (65.3%). Most of the participants (52.5%) indicated lack of clinical time was the main barrier for performing oral health related activities. Majority of the participants (76.7%) indicated that they need more dental training and education. Dental caries preventive methods (44.6%) was the most requested topic, of which workshops and seminars were the main preferred method (39.6%).

Conclusion: Although most of the participants reported good dental attitude and knowledge, a lack of the associated dental practice was detected. Therefore, more efforts are encouraged to enhance and facilitate dental practice among pediatricians and family physicians.

Keywords: Oral health, Attitude, Knowledge, Practice, Pediatricians, Family physicians

Relationship between Caregivers' Oral Health Literacy and their Child's Caries Experience

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Community Dental Health, 2019 Jun; 36(2):111-117.

Objective: This study aimed to assess the association between caregivers' oral health literacy (OHL) and the dental caries experience of their child.

Participants: This cross-sectional study was conducted among 300 caregiver/child dyads at a paediatric dental centre in Saudi Arabia. The OHL was assessed using an Arabic translated version of Comprehensive Measure of Oral Health Knowledge (CMOHK-A) questionnaire. Test-retest reliability and internal consistency was assessed using the appropriate statistical methods.

Main outcome measure: Childrens' dental caries experience was assessed using the DMFT and deft index (decayed, missing/extracted, filled teeth) for permanent and primary teeth respectively.

Results: The mean age of the caregivers and children was 37.9±7.9 years and 8.3±3.1 years respectively. Most children (87.7%) had dental caries experience (dmft ⟩ 0) and the mean DMFT/deft was 5.2±4.0. The means±standard deviations (SD) for untreated caries (DT/dt), missing/extracted teeth (MT/et) and filled teeth (FT/ft) were 2.6±2.5, 0.5±0.9 and 2.1±2.2 respectively. Multivariate linear regression models showed that caregivers educational levels and OHL scores were associated with the child's untreated caries levels. Caregivers' gender, educational levels and their perception of the child's oral health were significant predictors for child's lifetime caries experience. Children of caregivers with low OHL had more untreated caries than children of caregivers with adequate OHL.

Conclusion: This study found better caregiver OHL levels to be associated with lower caries experience for their child.

Keywords: Children; DMFT; caries; health education; health literacy; oral health.

Parental Presence/Absence in the Dental Operatory as a Behavior Management Technique: A Review and Modified View

Hicham Riba, Asma Al-Shahrani, Hayat Al-Ghutaimel, Adel Al-Otaibi, Salim Al-Kahtani

The Journal of Contemporary Dental Practice, 2018 Feb;19(2):237-241.

Introduction: Parental presence/absence in the dental operatory (also called: Parent-in-parent-out technique) is an extremely controversial aspect of the nonpharmacological BMTs. Historically, dentists used to exclude parents from dental operatory to avoid their interference with the dentist's aptitude to build a rapport and relationship with the child, hence increasing the child management problems by disrupting treatment and making the dentist unfocused and uncomfortable.

Aim: The purpose of this article is to review and emphasize on the importance of parental presence/absence in the dental operatory, especially in a certain age group, as a behavior management technique (BMT) in pediatric dentistry, and to present a modified view of this technique.

Results: This article reviews the current literature concerning behavior management in pediatric dentistry. It includes a medline database search and review of the comprehensive textbooks in pediatric dentistry. Some recommendations were based on the opinions of experienced researchers and clinicians.

Conclusion: Parent-in-parent-out technique in dental operatory is advocated to gain emotional support and avoid the effect of traumatic separation, especially in younger children or special health-care needs patients.

Clinical significance: The parent-in-parent-out technique in dental operatory is underused, or misused. This article clarifies the proper use of this technique along with a minor modification to it to make it more effective on young apprehensive dental patients.

Keywords: Behavior management; Dental operatory; Parental absence; Parental presence Pediatric dentistry.

A Review of Behavior Evaluation Scales in Pediatric Dentistry and Suggested Modification to the Frankl Scale

Hicham Riba, Saleha Al-Zahrani, Noura Al-Buqmi, ***Azzam Al-Jundi***

EC Dental Science, 2017 Dec;16: 269-275.

Aim: The purpose of this paper is to review and stress the importance of different behavior evaluation scales used in pediatric dentistry with more emphasis on the widely used Frankl scale, and to suggest a modification to the latter to clarify the gray area between the positive and negative ratings.

Background: One of the cornerstones in practicing pediatric dentistry is the ability to guide children positively throughout their dental experience and encourage positive dental attitude in order to improve their oral health. Anxiety associated with dental pro-cedures can be reflected on the child's behavior. Therefore, it is important for pediatric dentists to be able to assess and evaluate psychological, personal traits and behavioral responses of the child in order to identify the need for modifications in the management approaches to reduce dental anxiety.

Review Results: This paper reviews the current literature concerning behavior evaluation scales used in pediatric dentistry. It in-cludes MEDLINE database search and review of the comprehensive textbooks in pediatric dentistry. Some recommendations were based on the opinions of experienced researchers and clinicians.

Conclusions: The Frankl behavior scale, along with other scales, is highly useful in pediatric dentistry to assess the level of coopera-tiveness of the child during dental visits. A modification to the Frankl scale was suggested to add a fifth rating in order to make the scale more accurate and further reflective.

Clinical Significance: The need for more accurate scales had led to thinking about adding a new category to the Frankl scale. Once the child's behavior is assessed accurately, a clear planning for the ensuing visits could be achieved and behavioral management techniques are tailored to that specific child to help reduce the anxiety level.

Keywords: Behavior Evaluation Scales; Behavioral Rating Scales; Frankl Scale; Likert Scale; Pediatric Dentistry

Periodontics

2.9 PERIODONTICS

The Association Between Periodontitis and Erectile Dysfunction: A Systematic Review and Meta-Analysis.

Fathima Farook, Azzam Al Meshrafi, Nuzaim Mohamed Nizam, ***Abdulsalam Al Shammari***.

American Journal of Men's Health, 2021 May; 15(3): 15579883211007277.

Abstract: The objective of this study is to investigate the association between periodontitis (PD) and erectile dysfunction (ED). A systematic review and meta-analysis on data was extracted and conducted according to PRISMA. Relevant articles were selected from a literature search using MEDLINE, EMBASE, Scopus, Web of Science and CENTRAL from inception until August 2, 2020. Both randomized and nonrandomized controlled studies were included. Case reports, case series, nonsystematic reviews and trials published as abstract were excluded. Odds ratios (ORs) and corresponding 95% confidence intervals (CIs) were used to estimate the association between PD and the risk of ED. The meta-analysis was conducted with RevMan 5.3. Methodological quality assessment was carried out using the Newcastle-Ottawa Quality Assessment Scale and the quality of evidence was assessed using the GRADE approach. Six articles (215008 subjects) were included for analysis. Of the participants, 38,675 cases were compared to 1,76,333 healthy controls. Based on the random effects model, periodontitis was associated with an increased risk of ED (OR = 2.56, 95% CI: 1.70–3.85) as compared with the non-periodontitis individuals. The findings were statistically significant with a $p < .0001$. The statistical heterogeneity was high across all studies ($I2 = 98\%$, $p < .00001$). Estimates of total effects were generally consistent with the sensitivity and subgroup analyses.

Within the limits of the available evidence, our review and meta-analysis showed that a significant association exists between the PD and ED. The results should be interpreted with caution due to high degree of inconsistency across all the studies.

Keywords: periodontitis, periodontal disease, gingivitis, periodontal, erectile dysfunction, sexual dysfunction, impotence

Distal extension of palatal rugae as a limitation for donor soft tissue grafts in a Jordanian population: A cross-sectional study.

Khalid Nazmi Said, Areej Sulaiman Abu Khalid, ***Fathima Fazrina Farook***.

BMC Oral Health, 2021 Apr; 21(1), 203.

Background: The purpose of the cross sectional study was to investigate the distal extension of the rugae area in a Jordanian (Middle Eastern) population, as an anatomical limitation influencing the surgical decision of harvesting a palatal soft tissue graft. Factors that may influence or predict the extension were also assessed.

Methods: Sixty periodontally healthy participants (29 males and 31 females) were included. Maxillary alginate impressions were made and casts were poured. The measurements were highlighted from the origin of the rugae (near mid palatine raphe) to the terminal end with a sharp graphite pencil on the cast and a magnification lens was used for identification. The most posterior extension of the rugae were marked on the casts and determined by a standardized periodontal probe. The normal approximation test for binomial distribution was used to determine the proportion of the subjects with rugael extensions beyond the mesial end of the upper second premolar and fisher's exact test for the purpose of analysis of the association of this extension with other factors.

Results: In almost half (41.7%) of the sample, the rugae extended distal to the upper second premolar, 23.3% extended to the mid-palatal of the upper second premolar, and 11.7% extended to the mesial of the upper second premolar. The implication is that 90.0% of the rugae reached the upper second premolar and 78.3% extended beyond its mesial aspect. The normal approximation test performed with 95% CI with the "rugael extension proximal to the mesial end of the upper 2nd premolar" considered to be the "success" category revealed that the proportion of the subjects with rugael extensions proximal to the mesial end of the upper second premolar was significantly lower than the proportion beyond the mesial end of the upper second premolar (95% CI of 11.2–32.0%, p = .00001). There was no significant difference between gender, smoking status, gingival phenotype and palatal shape with the posterior extension of palatal rugae.

Conclusions: Palatal rugae in a sample of a Jordanian population extends beyond the mesial aspect of the upper second premolar which may cause a substantial limitation for graft harvesting from the palate. The hard palate of Jordanian patients may not be a reliable source of soft tissue grafts required for aesthetic mucogingival surgery. No significant association existed between the most posterior extent of palatal rugae and gender, gingival phenotype or palatal shape. Other possible sources should be explored.

Keywords: Palatal rugae, Jordanian population, Rugae patterns, Posterior extension

Simulation of Random Differential Periodontitis Outcome Misclassification with Perfect Specificity

Talal S. Alshihayb, Brenda Heaton.

JDR Clinical & Translational Research. 2021 Apr 24:23800844211007145, ahead to print.

Introduction: Misclassification of clinical periodontitis can occur by partial-mouth protocols, particularly when tooth-based case definitions are applied. In these cases, the true prevalence of periodontal disease is underestimated, but specificity is perfect. In association studies of periodontal disease etiology, misclassification by this mechanism is independent of exposure status (i.e., nondifferential). Despite nondifferential mechanisms, differential misclassification may be realized by virtue of random errors.

Objectives: To gauge the amount of uncertainty around the expectation of differential periodontitis outcome misclassification due to random error only, we estimated the probability of differential outcome misclassification, its magnitude, and expected impacts via simulation methods using values from the periodontitis literature.

Methods: We simulated data sets with a binary exposure and outcome that varied according to sample size (200, 1,000, 5,000, 10,000), exposure effect (risk ratio; 1.5, 2), exposure prevalence (0.1, 0.3), outcome incidence (0.1, 0.4), and outcome sensitivity (0.6, 0.8). Using a Bernoulli trial, we introduced misclassification by randomly sampling individuals with the outcome in each exposure group and repeated each scenario 10,000 times.

Results: The probability of differential misclassification decreased as the simulation parameter values increased and occurred at least 37% of the time across the 10,000 repetitions. Across all scenarios, the risk ratio was biased, on average, toward the null when the sensitivity was higher among the unexposed and away from the null when it was higher among the exposed. The extent of bias for absolute sensitivity differences ≥0.04 ranged from 0.05 to 0.19 regardless of simulation parameters. However, similar trends were not observed for the odds ratio where the extent and direction of bias were dependent on the outcome incidence, sensitivity of classification, and effect size.

Conclusions: The results of this simulation provide helpful quantitative information to guide interpretation of findings in which nondifferential outcome misclassification mechanisms are known to be operational with perfect specificity.

Knowledge Transfer Statement: Measurement of periodontitis can suffer from classification errors, such as when partial-mouth protocols are applied. In this case, specificity is perfect and sensitivity is expected to be nondifferential, leading to an expectation for no bias when studying periodontitis etiologies. Despite expectation, differential misclassification could occur from sources of random error, the effects of which are unknown. Proper scrutiny of research findings can occur when the probability and impact of random classification errors are known.

Keywords: bias, epidemiology, sensitivity and specificity, oral diagnosis, incidence, prevalence

A Quantitative Bias Analysis to Assess the Impact of Unmeasured Confounding on Associations between Diabetes and Periodontitis

Talal S. Alshihayb, Elizabeth A. Kaye, Yihong Zhao, Cataldo W. Leone, Brenda Heaton

Journal of Clinical Periodontology. Online published 2021 Jan;48(1):51-60.

Aim: To investigate unmeasured confounding in bidirectional associations between periodontitis and diabetes using quantitative bias analysis.

Methods: Subsamples from the Veterans Affairs Dental Longitudinal Study were selected. Adjusted for known confounders, we used Cox proportional hazards models to estimate associations between pre-existing clinical periodontitis and incident Type II Diabetes (n = 672), and between pre-existing diabetes and incident severe periodontitis (n = 521), respectively. Hypothetical confounders were simulated into the dataset using Bernoulli trials based on pre-specified distributions of confounders within categories of each exposure and outcome. We calculated corrected hazard ratios (HR) over 10,000 bootstrapped samples.

Results: In models using periodontitis as the exposure and incident diabetes as the outcome, adjusted HR = 1.21 (95% CI: 0.64-2.30). Further adjustment for simulated confounders positively associated with periodontitis and diabetes greatly attenuated the association or explained it away entirely (HR = 1). In models using diabetes as the exposure and incident periodontitis as the outcome, adjusted HR = 1.35 (95% CI: 0.79-2.32). After further adjustment for simulated confounders, the lower bound of the simulation interval never reached the null value (HR ≥ 1.03).

Conclusions: Presence of unmeasured confounding does not explain observed associations between pre-existing diabetes and incident periodontitis. However, presence of weak unmeasured confounding eliminated observed associations between pre-existing periodontitis and incident diabetes. These results clarify the bidirectional periodontitis-diabetes association.

Keywords: bias; confounding factors; diabetes mellitus; periodontal disease; periodontitis

Knowledge, Attitudes and Acceptance of Platelet-Rich Fibrin among Patients attending the Department of Periodontics in Dental University Hospitals in Riyadh, Saudi Arabia

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International Journal of Medical Dentistry, 2020 Mar;24(1):52-58.

Abstract: This study aims at assessing the knowledge, attitudes and acceptance of platelet-rich fibrin (PRF) among 519 adult patients who attended the Department of Periodontics of university dental hospitals in Riyadh, Saudi Arabia from January to March 2019, using a self-administered, online questionnaire of 15 questions. Descriptive statistics including frequencies and percentages was calculated

for data analysis. Less than half of the respondents have heard about the PRF procedure and knew its benefits (25% and 46%, respectively). Around 50% of the respondents thought that it accelerates wound healing and regeneration but it is painful, while 60% would agree to perform PRF procedure when needed but would not recommend it to others. Thus, increasing patients' level of knowledge and attitudes about PRF applications in dentistry is advisable. It is recommended to dentists to inform their patients about the safety and benefits of PRF, and to involve them in decision making.

Keywords: platelet-rich fibrin, patients' knowledge, patients' attitudes

An Assessment of the Variance in Patient's Knowledge of Dental Implant Treatment for Replacement Missing Teeth in Riyadh, Saudi Arabia

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EC Dental Science, 2020;19(3):1-12.

Background: Little is known about the variance in patients' knowledge of dental implant for the replacement of missing teeth.

Materials and Methods: We obtained a representative random sample of 396 patients, drawn from a target population of 585 patients at three dental institutions in Riyadh, Saudi Arabia. Prior to dental implant treatment, we tested the patients' knowledge using the Dental Implant Knowledge Scale.

Results: The answers to the 10-point scale were normally distributed (range = 1 to 7; median = 4.00; mean = 4.09; 95% CI = 3.94, 4.24). Most (369, 84.9%) of the patients achieved poor scores (≤ 5). The patients who achieved lower than average scores tended to be male, more than 40 years old, reside in rural areas, be smokers, and have a high-school education. They also tended to be retired, not to suffer from a systemic disease, and not to acquire information from dentists.

Conclusion: The patient's low scores on the Dental Implant Knowledge Scale reflected misconceptions about the complications and risk factors associated with implant failure, and the relationships between oral hygiene, systemic disease, smoking, and overall health. We recommend that dental teams in Saudi Arabia and elsewhere should administer the Dental Implant Knowledge Scale in practice to identify those patients who exhibit the poorest knowledge of dental implant, and to target these specific groups of patients for appropriate educational interventions prior to treatment.

Keywords: Dental Implants; Oral Hygiene; Patient Reported Outcome Measures; Peri-Implantitis; Periodontal Disease; Patient Education

A Systematic Review and Meta-Analysis of Local Administration of 1% Metformin as an Adjunct to Scaling and Root Planning on Periodontal Intrabony Defects

Hussam M. Alqahtani, Mercurious Mina

Journal of Dentistry and Oral Sciences, 2020 Sep;2(4):1-13.

The Purpose: This systematic review conducted to assess the effectiveness of local administration of 1 % Metformin as an adjunct to scaling and root planing on periodontal intrabony defects.

Methods: Two independents reviewers searched the Cochrane Central Register of Controlled Trials (CENTRAL), MEDLINE, and ClinicalTrials.gov.We included randomized controlled trials (RCTs) of local administration of 1% metformin interventions in patients with periodontal intrabony defect undergoing

scaling and root planing as compared to local administration of placebo gel where periodontal parameters were evaluated. The Cochrane RoB tool was used to evaluate the risk of bias. Meta-analyses for the quantitative data were performed. We assessed the level of certainty for our outcomes using (GRADE) tool.

Results: Among the 1666 studies screened, two RCTs were included in the meta-analyses. The meta-analysis showed a statistically significant difference for all outcomes except the plaque index. Quantitative analyses showed a weighted mean difference (WMD) of1.17 mm (95% CI=1.01 to 1.34 mm, P<0.00001) for depth of periodontal intrabony defect; a WMD of 2.54 mm (95% CI=2.20 to 2.88 mm, P<0.00001) for clinical attachment level; a WMD of 2.01 mm (95%CI=1.68 to 2.33 mm, P<0.00001) for probing depth (PD);a WMD of 0.38 (95% CI=0.14 to 0.62, P = 0.002) for bleeding on probing (BOP); and a WMD of 0.00 mm (95% CI=−0.04 to 0.04 mm, P=0.95) for plaque index. There is moderate certainty of the evidence for all outcomes.

Conclusions: Local application of 1% metformin in patients with periodontal intrabony defect may improve the clinical and radiographic periodontal parameters. Future clinical trials are required to confirm the clinical benefits of a 1% metformin application as adjunctive to scaling and root planing in patients with periodontal intrabony defect.

Keywords: Alveolar bone loss; Meta-analysis; Metformin; Periodontitis; Root planning; Systematic review

Anatomic factors influencing dimensions of soft tissue graft from the hard palate. A clinical study

Khalid N. Said, Areej S. Abu Khalid, ***Fathima F. Farook***

Clinical and Experimental Dental Research, 2020 Aug;6(4):462-469.

Objectives: The aim of the present study was to measure the thickness of the palatal mucosa in a Jordanian (Middle Eastern) population as well as identify possible factors that may influence the thickness of palatal mucosa.

Material and Methods: Sixty period on tally healthy subjects (29 males and 31 females) were selected. Fifteen measurement points were defined on the palate. The mucosal thickness in the hard palate was determined by “bone sounding” with a Hu-Friedy® round periodontal probe.

Results: The overall mean thickness of the palatal masticatory mucosa was 3.23 ± 0.47 mm. The mean thickness increased from the gingival margin to a more apical position irrespective of the tooth measured or side of the mouth in the following sequence: canine, second molar, first premolar, second premolar and lastly, the first molar. No significant difference between gender, smoking status, gingival phenotype andsides of the mouth with the thickness of palatal masticatory mucosa was determined. A significant difference between palatal shape and palatal gingival thickness was found.

Conclusions: The most appropriate site for graft harvesting is the canine-premolar area 8-13 mm from the mid-palatal aspect of each respective tooth in a Jordanian population. Except for the palatal shape, the side of the mouth, smoking, gender or gingival phenotype does not affect the graft harvest.

Clinical Relevance

Scientific Rationale for Study: Knowledge on the thickness of the masticatory mucosa is crucialin making decisions for surgical treatment modality and may affect surgical outcome. We measured the thickness of the palatal mucosa in a Jordanian population and identified possible influencing factors.

Principal Findings: The thickness varied according to the teeth and the canine to premolar region was found to be the appropriate donor site.

Practical Implications: This information on safe zone for graft harvest can guide the periodontist to make appropriate incisions and choose the appropriate location to obtain a graft of adequate thickness and dimensions.

Keywords: Masticatory mucosa, palatal thickness, transgingival probing

Association of periodontitis with metabolic syndrome: A case-control study

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Journal of International Society for Preventive & Community Dentistry, 2020 Jul-Aug;10(4):458-465.

Aim: This study was undertaken to assess the association between periodontitis and metabolic syndrome.

Materials and Methods: A case-control study was designed among 100 cases as patients with metabolic syndrome aged 35–74 years, and age- and sex-matched 100 controls as apparently healthy relatives or friends accompanying the cases visiting the diabetic outpatient department at Victoria Hospital, Bengaluru, Karnataka, India, using convenience sampling method. Information related to diabetes, hypertension, and oral hygiene practices was collected. Periodontal health status was measured using community periodontal index. Metabolic syndrome was diagnosed based on the criteria of National Cholesterol Education Program Adult Treatment Panel III. Chi-square test and logistic regression were used for analysis.

Results: Significantly more number of cases had shallow pockets 4–5 mm, deep pockets ≥ 6 mm, and also more number of loss of attachment code 1, code 2, code 3, and code 4 compared to controls. Bivariate analysis showed significant association between metabolic syndrome and body mass index, smoking, and tobacco chewing. The association between periodontitis and metabolic syndrome was significant with increased risk of developing metabolic syndrome among the subjects with community periodontal index code 3 and code 4 (odds ratio [OR] = 17) and among the subjects having loss of attachment code 1, code 2, code 3, and code 4 (OR = 12). Association remained significant even after adjustment with other variables (adjusted OR = 6).

Conclusion: This study showed significant association between periodontitis and metabolic syndrome. Further prospective and randomized control trials are recommended to assess causal association between these two diseases.

Keywords: Association, chronic periodontitis, metabolic syndrome, periodontal diseases, periodontitis

The Impact of Periodontitis Exposure Misclassification Bias from Partial-Mouth Measurements on Association with Diabetes and Cardiovascular Disease.

Talal S. Alshihayb, Elizabeth A. Kaye, Yihong Zhao, Cataldo W. Leone, Brenda Heaton

Journal of Clinical Periodontology, 2020 Dec; 47(12):1457-1465.

Aim: To quantify exposure misclassification bias arising from use of partial-mouth protocols in studies of periodontitis–systemic disease associations.

Materials and Methods: Using data from 10,134 adults participating in the National Health and Nutrition Examination Survey, we classified periodontal status based on full-mouth clinical examinations and three commonly used partial-mouth protocols. Associations between periodontitis and self-reported diabetes and cardiovascular disease were evaluated under each protocol using adjusted logistic regression. Percent relative bias was calculated to evaluate magnitude and direction of bias.

Results: Misclassification primarily resulted in underestimation of associations, the extent of which depended on both the outcome under study and exposure severity. Bias due to misclassification of severe periodontitis was negligible for cardiovascular disease (0%–4.1%) compared to diabetes (177.7%–234.1%). In contrast, bias in moderate periodontitis associations was comparable across each outcome—diabetes (28.4%–39.5%) and cardiovascular disease (8.9%–46.7%). Results did not meaningfully change based on the partial-mouth protocol implemented. Stratified analyses showed increased bias among those with ≤15 teeth. Use of mean attachment loss as a continuous exposure resulted in minimal-to-no bias.

Conclusions: Exposure misclassification bias due to use of partial-mouth protocols can yield inaccurate conclusions about periodontitis–systemic disease associations, the extent of which may depend on periodontitis classification and the association under study.

Keywords: bias, periodontal disease, periodontitis, sensitivity and specificity

Reliability assessment between clinical attachment loss and alveolar bone level in dental radiographs.

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Clinical and Experimental Dental Research, 2020 Dec; 6(6):596-601.

Background: The clinical attachment level (CAL) and radiographically assessed bone levels are used to assess the loss of periodontal tissue support in periodontitis, a chronic, multifactorial inflammatory disease of the periodontium. However, few studies have been done to study the relationship between these two parameters. According to our knowledge, this is the first study investigating the relationship between the two measurements using intraclass correlation analysis.

Aim: The aim of the study is to investigate the relationship between CAL and radiographically assessed bone level in teeth affected with periodontitis.

Methods: A retrospective cross-sectional study was conducted by selecting a sample of 880 periodontal sites in 104 periodontitis patients, aged 25–60 years. CAL and peri-apical radiographs of the selected sites were obtained from the computerized patient records. The distance from the cemento-enamel junction (CEJ) to the base of the alveolar bone level (ABL) was measured. The data was analyzed using SPSS.

Results: Intraclass correlation analysis (ICC) revealed a moderate degree of reliability between CAL and CEJ to ABL measurements. The average ICC was 0.68 with a 95% confidence interval of 0.53–0.77 ($p < .001$) indicating moderate to good reliability. Comparing the types of teeth, the central incisors, particularly the lower central incisors showed the highest ICC values (ICC: 0.822, CI: 0.77–0.86) indicating good reliability while the premolar and molars showed poor to moderate agreement (Maxillary premolars ICC: 0.464, CI: −0.18–0.74; maxillary first molar ICC: 0.516, CI: −0.154–0.772; mandibular first premolar ICC: 0.662, CI: 0.269–0.782; mandibular first molar ICC: 0.625, CI: 0.31–0.82). A moderate correlation existed between the radiographic and the clinical assessments ($r = 0.5$, $p < .001$).

Conclusion: Despite the fact that significant varying levels of reliability has been found between CAL and radiographic bone level, both the clinical and radiographic examinations should be performed for the accuracy of diagnosis.

Herpes Viruses: Role in Periodontitis

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Journal of Critical Reviews, 2020; 7(10): 2798-2803.

Abstract: In the pathogenesis of severe periodontitis, there is increasing evidence regarding the involvement of herpes viral, bacterial and host immune factors but there is no clarity on the relative importance of each of these factors. Herpes viruses are re-activated by immunosuppressive factors and, maybe for this reason, they are also major risk factors for periodontitis. When the periodontitis is in a progressive phase, it seems that the inflamed periodontium is a major site for accumulation and re-activation of Epstein-Barr virus and cytomegalovirus. Matrix metalloproteinases and osteoclasts are activated by cytokines. Cytokines in turn are released by herpes viruses. Herpes viruses may thus act as pathogens in the progression of periodontitis. Antibacterial immune mechanisms are weakened because of an active herpesvirus infection resulting in a rise in the number of bacteria which are considered to be periodontopathogens. A suppressed herpesvesvirus infection may be re-activated by some of the periodontopathogenic bacteria. This synergy between the bacteria and herpesviruses may play a significant part in the commencement and advancement of periodontitis. Herpesvirus-induced periodontitis suggests that the immunity against herpesviruses forms a crucial feature in attaining a stable periodontium. There is a need for further investigation on the part played by herpesviruses in periodontitis which will result in enhanced diagnosis, better therapy and disease prevention. Vaccines specific to human cytomegalovirus (HCMV) and Epstein Barr virus (EBV) that shape treatment strategies against herpesvirus, may be effectively utilized in the inhibition and therapy for diseases of periodontal origin, specifically the periodontitis.

Keywords: herpes viruses, periodontitis, pathogenesis, bacteria

Proposal for a novel murine model of human periodontitis using Porphyromonas gingivalis and type II collagen antibody injections

Abdulsalam Alshammari, Salomon Amar

The Saudi Dental Journal, 2019 Apr;31(2):181-187.

Introduction: Periodontitis is a chronic disease in humans induced by several pathogens including *Porphyromonas gingivalis* (P. gingivalis). Although mouse models of human periodontitis have been developed for study using an oral gavage of *P. gingivalis*, existing models take over a month to develop in order to ensure adequate periodontal destruction. The aim of the present study is to determine if using an injection of a cocktail of type II collagen antibodies along with an oral gavage of *P. gingivalis* in mice induces adequate periodontal destruction in a shorter time so as to potentially serve as a more useful mouse model of periodontitis.

Methods: Twenty-eight DBA1/BO male mice were placed in four groups: Group A (antibody injection plus gavage), Group B (gavage only), Group C (antibody injection only), and Group D (neither antibody injection nor gavage, control). Between six and eight weeks old, all mice underwent antibiotic administration, and at eight weeks old, were given antibody injection (Groups A and C) and oral *P. gingivalis* gavage (Groups A and B). Fifteen days after gavage Groups A and B received gavage, all mice were euthanized. Histomorphometric, morphometric, and cell counting analyses were conducted using analysis of variance (ANOVA) and Kruskal Wallis analysis followed by pairwise *t*-tests using Bonferroni correction.

Results: For histomorphometric analysis, mean distance from the cemento-enamel junction to the alveolar bone crest (CEJ-ABC) and the mean epithelial downgrowth (ED) in µm was statistically significantly highest for Group A (CEJ-ABC 1.49.81 vs. Group B 101.46, Group C 78.74, and Group D 66.23, $p < 0.0083$; ED 66.76 vs. Group B 25.92, Group C 9.21, and Group D 9.10, $p < 0.0083$). Morphometric analysis also showed that Group A had a significantly higher mean CEJ-ABC in µm compared to all other groups (265.50 vs. Group B 195.77, Group C 150.33, and Group D 133.93, $p < 0.0083$). A similar pattern was seen in cell counting, in which Group A had a significantly lower mean count of fibroblasts per 45 × 50 µm field (8.02 vs. Group B 9.56, Group C 12.09, and Group D 11.02, $p < 0.0083$), and a significantly higher mean count polymorphonuclear leukocytes per 45 × 50 µm (4.59 vs. Group B 1.74, Group C 0.83, and Group D 0.68, $p < 0.0083$).

Conclusion: The results of this study provide proof-of-concept for a mouse model that can be quickly developed for human periodontitis using a type II collagen antibody cocktail injection coupled with oral gavage of *P. gingivalis* in DBA1/BO male mice. Future studies should verify the results of this proof-of-concept, compare this new model to existing models, and evaluate the extent of this model's usefulness.

Keywords: SstT protein, *Porphyromonas gingivalis,* Periodontitis, Models, Animal, Image cytometry

A Narrative Review of the Prevalence of Periodontitis in Saudi Arabia: A Proposal for a National Oral Health Research Agenda for Vision 2030

Abdulsalam K. S. Alshammari, Monika M. Wahi

The Open Dentistry Journal, 2019 Apr;13:171-176.

Objective: The objective of this narrative review is to summarize the current knowledge on the prevalence of periodontitis in the Kingdom of Saudi Arabia (KSA) and to make recommendations for monitoring and improving oral health in the KSA population.

Background: Periodontitis is a significant health issue in the general population, so conducting routine public health surveillance for this condition is important in every country. KSA is currently implementing a strategic plan called Vision 2030 which aims to improve many of the country's infrastructures, including healthcare.

Methods: To conduct this narrative review, Google Scholar (GS) was used to search for peer-reviewed articles on the prevalence of periodontitis in KSA. No limits were placed on the year of publication, but only articles translated into English were considered. Search terms used included "Saudi Arabia", "periodontitis", "surveillance", "prevalence", "rates", "oral health" and "dental".

Results: The earliest estimate identified was from 1992, in which the rate of lack of periodontal health was estimated to be 90% in KSA residents aged 25 and over. A more recent estimate reported rates around 50%, but used a different case definition. Studies on tobacco use, periodontal health and KSA established that how tobacco is used strongly influences periodontal status. Other dental studies in KSA focus on other topics. The Saudi Health Information Survey (SHIS) conducted in 2013 asked oral health questions, but did not seek to estimate the rates of periodontitis in KSA.

Conclusion: The World Health Organization's (WHO) recommendations suggest that KSA should conduct research to develop surveillance case definitions of periodontitis that will have specific utility in KSA, and can be standardized to compare KSA rates with the rates worldwide. The existing surveillance definitions and efforts in other countries have been considered less than optimal, so research is needed to inform KSA's effort. Recommendations are made for a national oral health research agenda in KSA under Vision 2030.

Keywords: Prevalence, Periodontitis, Saudi Arabia, Oral health, Gum disease, Dental studies.

Risk indicators of aggressive periodontitis in a Jordanian population

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BMC Oral Health, 2019 Jul;19(1):155.

Background: Knowledge of the risk indicators of aggressive periodontitis (AgP) will help clinicians to better diagnose the disease, put a treatment plan that involves modification of modifiable risk indicators, understand nonmodifiable risk indicators, and may potentially serve as an aid in developing preventive programs. The objective of the present study was to assess risk indicators of aggressive periodontitis (AgP) in Jordan including sociodemographic factors, oral hygiene habits, smoking, family history and parents' consanguinity.

Methods: A total of 162 patients (81 AgP and 81 controls), attending the Periodontology clinic at Jordan University of Science and Technology, Dental Teaching Centre, were interviewed and examined. All AgP subjects had full periodontal and radiographic examination. The data recorded included socio-demographic and economic variables, oral hygiene and smoking habits, family history and parents' consanguinity.

Results: Most AgP patients were young females, had ≤12 years of education, lived in urban areas and brushed their teeth ≥ once daily. Risk indicators of AgP included: age > 35 years, female gender and positive family history.

Conclusions: Risk indicators associated with AgP in this study population were: age > 35 years, female gender and positive family history of periodontal disease.

Keywords: Aggressive periodontitis, Risk indicators, Jordan

Awareness of the Relationship between Systemic and Periodontal Diseases among Physicians and Dentists in Saudi Arabia and Kuwait: Cross-sectional Study

Ahmad Al Sharrad, ***Khalid N. Said, Fathima F. Farook,*** Sami Shafik, Khallaf Al-Shammari

The Open Dentistry Journal, 2019 Jul;13:288-295.

Background: Previous studies have shown possible association between periodontal diseases and Diabetes Mellitus (DM), Cardiovascular Disease (CVD) and Adverse Pregnancy Outcomes (APO). Increasing the knowledge of physicians and dentists regarding the association between periodontal disease and systemic diseases should improve their ability to provide a high standard of treatment for the disease and prevent its consequences. In our study, we sought to identify knowledge gaps in the awareness of the relationship between systemic and periodontal diseases among dentists and physicians from the Kingdom of Saudi Arabia and the State of Kuwait.

Methods: A cross-sectional study was performed with a convenient sample of selected physicians and dentists in Saudi Arabia and Kuwait using a self-developed structured questionnaire. Physicians' and dentists' awareness were assessed regarding current evidence of the relationship between systemic diseases and conditions (DM, CVD, APO) and periodontal diseases.

Results: A total of 134 (21.5%) of the identified physicians and 485 (78%) of the identified dentists participated in this study. More than half of the participants (52.1% physicians and 67.5% dentists) agreed that there is a relationship between periodontal diseases and DM, CVD and APO. Dentists had a statistically higher level of awareness compared with the physicians. The findings related to the awareness

of the dentist sub groups highlighted that periodontists were significantly more likely to have a good level of knowledge.

Conclusion: Within the limitations of this study, we concluded that the awareness of physicians and dentists regarding the relationship between periodontal diseases and systemic diseases (DM, CVD, APO) is generally low, Therefore, improved collaboration between medical and dental health providers is recommended.

Keywords: Oral health, Periodontal disease, Systemic disease, Cardiovascular disease, Pregnancy outcomes, Diabetes mellitus.

An Update on the Mechanisms of Phenytoin Induced Gingival Overgrowth

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The Open Dentistry Journal, 2019;13:430-435.

Background: Phenytoin induced gingival overgrowth, a side effect with multifactorial aetiology, is characterized by an increase in the volume of extracellular tissues, particularly collagenous components, with varying degrees of inflammation.

Objective: The aim of this paper is to review the available literature regarding the pathophysiological mechanisms of phenytoin induced gingival overgrowth.

Methods: A thorough literature search of the PubMed/ Embase/ Web of science/ Cochrane central database was conducted to identify the mechanisms involved in the process of phenytoin-induced gingival overgrowth using the following keywords: Phenytoin; Anticonvulsant; Gingival Overgrowth; Gingival Enlargement, Gingival Hyperplasia; Drug Induced Gingival Enlargement; Drug Induced Gingival Overgrowth

Results: According to the available evidence, several mechanisms have been proposed addressing the pathophysiological mechanism of phenytoin induced gingival overgrowth both at a cellular and molecular level. Evidence suggests that the inflammatory changes in the gingival tissues orchestrate the interaction between phenytoin and fibroblasts particularly resulting in an increase in the extracellular matrix content.

Conclusion: However, the mechanism of production of inflammatory mediators is not fully understood. This, together with the high prevalence of Phenytoin induced gingival overgrowth, warrants further research in this area in order to develop treatment and preventive strategies for the management of this condition.

Keywords: Anticonvulsant, Gingival overgrowth, Gingival enlargement, Phenytoin, Drug induced gingival enlargement, Drug induced gingival overgrowth.

Association of Periodontal Disease and Polycystic Ovarian Syndrome: A Systematic Review and Meta-analysis with Trial Sequential Analysis

Fathima F. Farook, Ka Ting Ng, Nizam MNM, Wen J. Koh, Wan Y. Teoh

The Open Dentistry Journal, 2019;13:478-487.

Introduction: Several articles have suggested a potential synergistic relationship between periodontal disease and systemic inflammatory diseases, such as Polycystic Ovarian Syndrome (PCOS) and diabetes

mellitus. However, the associations between periodontal disease and PCOS population remain unclear in the literature.

Objective: The primary aim of this review is to examine the associations between periodontal disease and PCOS with different scoring methods, namely clinical attachment loss, probing depth, gingival index, percentage of bleeding on probing and plaque index.

Methods: MEDLINE, EMBASE and CENTRAL were systematically searched for observational studies and case-control studies from its inception until 2nd June, 2019. Case reports, case series, non-systematic reviews and trials published as abstracts were excluded.

Results: Four articles (614 subjects) were included for analysis. Out of 614 subjects, 329 PCOS patients were compared to 285 healthy subjects. In comparison to healthy cohort, women with PCOS had a statistically significant increase in clinical attachment loss (MD: 0.34, 95% CI: 0.13-0.55, ρ=0.002), probing depth (MD: 0.35, 95%CI: 0.21-0.48, ρ<0.001), gingival index (MD: 0.70, 95% CI: 0.70-1.11, ρ<0.001) and percentage of bleeding on probing (MD: 34.41, 95% CI: 20.23-48.59, ρ<0.001). No difference was demonstrated in plaque index (MD: 0.42, 95% CI: -0.29-1.12, ρ=0.24) for both PCOS and healthy cohort.

Conclusion: PCOS is significantly associated with a higher severity of the periodontal disease. This association should be emphasized during the management of PCOS patients, by including referral to dentists or periodontists for regular mechanical debridement of plaque and periodontal maintenance.

Keywords: Gingivitis, Periodontitis, Periodontal disease, Polycystic ovarian syndrome, Stein Leventhal syndrome, Polycystic ovarian disease.

A Review of the Effectiveness of Antiseptic Mouth Rinses for Oral Health

Fathima Fazrina Farooq, Khalid N. Said

Journal of Oral Hygiene & Health, 2018; 6(3):1000246.

Abstract: This narrative review evaluates current evidence related to the effectiveness of various mouth rinses available in retail outlets considered to be anti-plaque and anti-gingivitis agents. There is a plethora of commercial mouth rinses available and it becomes mandatory for a clinician to understand the specifics of oral rinses to be able to choose an appropriate rinse for a patient. This review provides an insight on the available mouth rinses for the reduction of plaque and gingivitis as well as the rationale for their use, mechanisms of action, benefits, adverse effects and precautions.

Keywords: Mouth rinse; Essential oils; Chlorhexidine; Cetylpyridinum chloride; Antiplaque agents; Antigingivitis agents; Anti-infective agents

Evaluation of Periodontal Changes Adjacent to Extraction Sites during Upper Canine Retraction

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The Journal of Contemporary Dental Practice, 2017 Feb;18(2):117-125.

Introduction: There is an intimate relationship between orthodontic therapy and the periodontal changes that occur during tooth movement.

Materials and methods: This prospective clinical trial aims at investigating the movement of both the free and attached gingiva, as well as the movement of the alveolar bone in the extraction site of the upper 1st premolars during the retraction of the upper canines. In this study, 17 patients (10 female, 7 male) requiring 1st premolar extraction before orthodontic tooth movement were selected and treated at the Department of Orthodontics in the Faculty of Dentistry in University of Hama, Hama, Syria. The upper 1st premolars were extracted, and the implant AutoTacs were applied on the alveolar bone afterward. Then, measurements between the center of the implant AutoTacs and the L-shape wire were taken, utilizing digital Vernier caliper. After 3 weeks of extraction, tattooing marked points were placed on the free and the attached gingival, and the measurements were taken using the same digital Vernier caliper. Closed coil springs made of nickel-titanium were used to retract the upper canines, and a force of 150 gm was applied.

Results: The results of this study showed significant differences between the movement of both the free and attached gingiva and the movement of the corresponding upper canines ($p < 0.001$). The movement of the free gingiva had formed about 77% of the amount of the movement of the upper canine retraction. No significant differences were detected between the place of implant AutoTac X1 and the L-shaped wire (W) during the retraction of the upper canine. On the contrary, significant differences were noticed between the place of implant AutoTac X2 and the L-shaped wire (W) during the retraction of the upper canine ($p < 0.001$).

Conclusion: There is significant movement of hard and soft tissues during and after premolar extraction and orthodontic therapy.

Clinical significance: The movement of supporting tissues of the teeth along with the alveolar bone during canine retraction is an important biological characteristic of the orthodontic tooth movement. Clinicians need to understand the role and importance of the supporting tissues during orthodontic treatment, which needs to be incorporated into their routine clinical evaluations.

Keywords: Orthodontic; Periodontal Prospective clinical trial.

Oral Health-Related Quality of Life and Periodontal Status of Pregnant Women

Amrita Geevarghese, Jagan Kumar Baskaradoss, P. Sankara Sarma

Maternal and Child Health Journal, 2017 Aug; 21(8):1634-1642.

Aim: The purpose of this study was to assess the difference in the oral health related quality of life (OHRQoL) and the oral health status between pregnant and non-pregnant women.

Methods: This cross-sectional study included 150 pregnant women (mean age 23.8 ± 3.01) and 150 non-pregnant women (mean age 25.2 ± 3.35). Data were collected through a self-administered structured questionnaire, followed by an oral examination. Oral health impact profile-49 (OHIP-49) questionnaire was used to capture the individual's perceived OHRQoL. The periodontal disease assessment was based on the pocket depth (PD) and clinical attachment loss (CAL) measured with the cemento-enamel junction as the reference point. Decayed (D), Missing(M) and Filled (F) teeth (DMFT) index was used to measure the caries experience.

Results: The overall OHIP score for pregnant women (47.33 ± 8.56) was significantly ($p = 0.03$) higher, when compared to non-pregnant women (37.87 ± 9.61). Higher scores indicate a poorer OHRQoL among the pregnant women. Fourteen items of the OHIP-49 were higher for pregnant women and the subgroups that were significantly different between the two groups were: 'functional limitation', 'physical pain', 'psychological discomfort', 'psychological disability' and 'handicap'. The mean PD and CAL for pregnant women was significantly higher than that of non-pregnant women ($p < 0.01$). Dichotomized DMFT scores

(≤6 and >6) showed significant difference ($p < 0.01$) between the two groups. Multivariate regression model showed that periodontitis ($p = 0.01$) and pregnancy status ($p < 0.01$) had a positive linear relationship with OHIP-49 scores after adjusting for all other variables.

Conclusion: The periodontal health and OHRQoL of pregnant women was poorer than non-pregnant women.

Keywords: OHIP-49; OHRQoL; Periodontitis; Pregnancy; Preterm.

Chemotherapeutic Decontamination of Dental Implants Colonized by Mature Multispecies Oral Biofilm

Sabastien Dostie, ***Lubna T. Alkadi***, Gethin Owen, Jiarui Bi, Ya Shen, Markus Haapasalo, Hannu S. Larjava

Journal of Clinical Periodontology, 2017 Apr;44(4):403-409.

Aim: No studies have tested disinfectants on mature multispecies oral biofilms on titanium substrata. The aim of this study was to investigate the efficacy of commonly used antimicrobial agents in decontamination of multispecies mature oral biofilm on sandblasted, large-grit, acid-etched (SLA) titanium implants.

Methods: SLA titanium disks were inoculated with dental plaque and cultured anaerobically for 21 days. The disks were rinsed with 0.9% NaCl, exposed for 2 min. to tetracycline paste, 1% Chlorhexidine gel (CHX), 35% phosphoric acid gel (Etch) or a novel chemical formula (0.3% cetrimide, 0.1% CHX and 0.5% EDTA) and then rinsed again with 0.9% NaCl. Bacteria were quantified from scanning electron micrographs of the implant surfaces. Living bacteria were quantified with confocal laser scanning microscopy (CLSM).

Results and conclusions: Rinsing the surfaces with 0.9% NaCl removed the majority of the biofilm. However, bacteria persisted in all specimens and none of the disinfectants was superior to the double saline rinse group. CLSM analysis showed that CHX and Etch groups had a statistically significant reduction of viable bacteria, although small. Overall the results show that many disinfection agents used in the clinic are ineffective in biofilm removal and leave live bacteria on the surface.

Keywords: biofilm; chlorhexidine; decontamination; implant; phosphoric acid; tetracycline.

Intra-Operative Application of Chlorhexidine Gel Reduces Bacterial Counts in Internal Implant Cavity

Farzan Ghannad, ***Lubna T. Alkadi,*** Colin B. Wiebe, Ya Shen, Markus Haapasalo, Hannu S. Larjava.

European Journal of Oral Sciences, 2015 Dec;123(6):425-431.

Abstract: A prospective clinical trial was conducted to assess the bacterial-inhibitory potential of 1% chlorhexidine (CHX) gel in the internal cavity of implant screw holes, when utilized at the time of implant placement. A total of 40 Straumann (S) and Nobel Biocare (N) implants were divided into test (ST or NT; implant + CHX gel) and control (SC or NC; implant only) groups. Total numbers of colony-forming units (CFUs ml(-1)) were assessed at a minimum of 3 months postsurgery by aerobic and anaerobic culture. A set of specimens was stained with Gram stain. The mean sample-collection time was 110 d for the test population and 98 d for the controls. The use of 1% CHX gel significantly reduced bacterial counts in both the ST and NT samples by over three logs compared with controls. No statistical differences in the numbers of CFUs ml(-1) were evident between aerobic and anaerobic cultures. Differences in the numbers

of CFUs ml(-1) between ST and NT groups were not statistically significant. Microscopic analysis showed mainly Gram-positive coccoid species in most samples.

Keywords: biofilm; chlorhexidine; dental implant; screw hole.

Common Periodontal Diseases of Children and Adolescents

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International Journal of Dentistry, 2014 Jun;2014(850674):1-7.

Background. Since 2000, studies, experiments, and clinical observations revealed high prevalence of periodontal diseases among children and adolescents. Therefore, this paper was designed to provide an update for dental practitioners on epidemiology, microbiology, pathology, prevention, diagnosis, and treatment of periodontal diseases in children and adolescents.

Methods. This paper reviews the current literature concerning periodontal diseases in pediatric dentistry. It includes MEDLINE database search using key terms: “periodontal diseases in children,” “Periodontal diseases in adolescents,” “periodontal diseases risk factors,” “microbiology of periodontal diseases,” “classification of periodontal diseases,” “epidemiology of periodontal diseases,” and “treatment of periodontal diseases.” Articles were evaluated by title and/or abstract and relevance to pediatric dentistry. Sixty-five citations were selected by this method and by the references within the chosen articles. A review of the comprehensive textbooks on pediatric dentistry and periodontology was done. Some recommendations were based on the opinions of experienced researchers and clinicians, when data were inconclusive.

Oral fluid based biomarkers in periodontal disease: part 1. Saliva

Hani S. AlMoharib, Abdulrahman AlMubarak, Raed AlRowis, ***Amrita Geevarghese***, R. S. Preethanath, Sukumaran Anil

Journal of International Oral Health: JIOH, 2014 Jul;6(4):95-103.

Abstract: Traditional clinical measurements such as probing pocket depth, bleeding on probing, clinical attachment loss; plaque index and radiographs used for periodontal diagnosis are often of limited usefulness as they are indicators of previous periodontal disease rather than present disease activity. A literature search was carried out to find out all the available tests that indicate periodontal disease markers in saliva. All major databases were searched to compile the information on published reports between 1999 and 2014. The list of biomarkers available to date is compiled and presented in a table format. Each biomarker is discussed separately based on the available evidence. Based on the evidence, it can be concluded that several sensitive salivary indicators of periodontitis are available to detect the presence, severity and response to treatment. Further studies are warranted to analyze the sensitivity and reliability of these indicators that might help in developing non-invasive tests that could help in the diagnosis of periodontal disease.

Keywords: Biomarkers; diagnosis; periodontal disease; saliva.

The Prevalence of Oral Candida Infections in Periodontitis Patients with Type 2 Diabetes Mellitus

Sultan Al Mubarak, Asirvatham Alwin Robert, ***Jagan Kumar Baskaradoss***, Khalid Al-Zoman, Abdulaziz Al Sohail, Abdulaziz Alsuwyed, Sebastian Ciancio.

Journal of Infection and Public Health, 2013 Aug;6(4):296-301.

Objectives: The purpose of this study was to determine the prevalence of Candida spp. in periodontitis patients with type 2 diabetes mellitus.

Methods: This cross-sectional study included 42 diabetic patients with periodontitis (aged 21-70 years; 18 males and 24 females). Clinical measurements included probing pocket depth (PPD), clinical attachment level (CAL) and hemoglobin A1c (HbA1c) levels. Sub-gingival samples were collected from the mesio-buccal aspect of 3 teeth for fungal analysis. Candida species, including Candida albicans, Candida dubliniensis, Candida tropicalis and Candida glabrata, were identified using Gram staining, the germ tube test, CHROMagar, Staib agar and API 20C AUX.

Results: The overall prevalence of Candida in diabetic patients with periodontitis observed in our study was 52%. The most common spp. of Candida identified were C. albicans (38%), followed by C. dubliniensis (9.5%), C. tropicalis (4.7%) and C. glabrata (4.7%). Compared to females, male patients were characterized by increased levels of Candida infections. Our results also indicate that individuals over the age of 40 had increased levels of Candida infections compared to patients younger than 40. Candida infections were higher among subjects with elevated blood sugar levels (HbA1c>9) compared to individuals with well-controlled blood sugar levels (HbA1c<6). Patients with PPDs≥5 had an increased risk of Candida infection compared to patients with PPDs between 3 and 4.

Conclusion: This study indicates that the frequency of C. albicans is higher than the frequencies of C. dubliniensis, C. tropicalis and C. glabrata in diabetic patients with periodontitis. Candida infections were observed at increased frequencies among subjects with high blood sugar levels and PPDs≥5.

Keywords: Diabetes, Infection, Candidiasis, Saudi Arabia

Prosthodontics

2.10 PROSTHODONTICS

To Evaluate and Compare the Effect of Number of Firings on the Color Stability of All-Ceramic System Using a Spectrophotometer: An in Vitro Study.

Rajkiran Chitumalla, Abdul Kader Al Jarrah, Swapna Munaga, Deepi Shrivastava, ***Abdul Salam Ali***, Arpit Singhi.

Annals of the Romanian Society for Cell Biology. 2021 Apr; 25(4):1209-1217.

Background: Ceramic restorations have been advocated for superior esthetics, and various materials have been used to improve ceramic core strength, but there is a lack of information on how color is affected by fabrication procedures. This study was designed to compare the effect of no. of firings on color stability in all ceramic restoration.

Methods and materials: Thirty-disc shaped specimens were made of 7mm diameter with 2mm thickness (All-ceramic- ivoclar IPS e-max press). Repeated firing cycles (5, 7, or 9) was performed, and associated color change was compared. Color differences among the specimens was measured using a spectrophotometer. A portable reflectance spectrophotometer is used. Values of the color change are recorded in the CIELAB color system. Data expressed in Commission Internationale de 1'Eclairage (CIE) LAB system coordinates. The CIELAB color space provides L*a*b* values for each sample. Statistical analysis of data was done to draw conclusions.

Result: The L*a*b* values of all ceramic system were affected with increase number of firings (5,7,9) on veneering porcelain material. L* value non-significantly increase. For veneering porcelain, the a* value decreased after repeated firings and the b* value decreased after repeated firings.

Conclusion: Too many firings give a lifeless over translucent porcelain in a clinical situation, a comparative analysis will help a clinician to choose a restoration that is best suited for a patient and which will also restore the esthetics.

Keywords: All ceramic crowns, Esthetics, Firing

Combined rehabilitation of a lower lip defect after resection of floor of mouth cancer: A clinical report.

Hatem Alqarni, Patti Montgomery, Ruth Aponte-Wesson, Alexander M. Won, Theresa M. Hofstede, Mark S. Chambers.

The Journal of Prosthetic Dentistry, 2021 Apr 16. Ahead to print, ahead to print.

Abstract: This clinical report describes the successful prosthetic rehabilitation of a deficient lower lip in an edentulous patient who had undergone surgery for removal of a squamous cell carcinoma of the anterior floor of the mouth and vestibule. The rehabilitation used a combined approach of an extraoral lip prosthesis joined by 3 magnets to an intraoral implant-retained mandibular resection prosthesis. The outcome demonstrated rehabilitation of the lower third of the face by eliminating loss of fluids and by improving the facial profile, lip contour and competence, esthetics, the patient's eating ability, speech intelligibility, and reported quality of life.

Prosthetic rehabilitation of meth mouth with implant-supported fixed dental prostheses: A clinical report.

Hatem Alqarni, Mohammed Alsaloum**, **Abdulaziz Alzaid.

Journal of Prosthetic Dentistry. 2021 Apr 15:S0022-3913(21)00146-3, ahead to print.

Abstract: This clinical report describes the prosthetic restoration of a failing dentition subsequent to methamphetamine abuse. The treatment involved the use of endosteal dental implants and milled cobalt-chromium, screw-retained, implant-supported fixed dental prostheses. At the 1-year follow-up, the prosthetic rehabilitation had markedly improved the patients' health, esthetics, and function.

The Relationship Between Centric Occlusion and The Maximal Intercuspal Position and Their Use as Treatment Positions for Complete Mouth Rehabilitation: Best Evidence Consensus Statement.

Mathew T. Kattadiyil, ***Abdulaziz A. Alzaid***, Stephen D. Campbell.

Journal of Prosthodontics. 2021 Apr;30(S1):26-33.

Purpose: The purpose of this Best Evidence Consensus Statement was to evaluate the existing literature relative to two focus questions: How often does centric occlusion coincide with maximal intercuspal position in dentate and partially dentate populations?; and should centric occlusion or maximal intercuspal positions be equivalent for dentate and partially dentate patients undergoing complete mouth rehabilitation?

Materials and Methods: Keywords used in the initial search were: intercuspal position, centric occlusion, centric relation, maximal intercuspal position, prosthodontic rehabilitation, and occlusion. The search was then limited to Systematic Reviews, Randomized Controlled Studies, Meta-analyses and Clinical Trials.

Results: The initial search strategy related to the selected search terms resulted in more than 15,000 articles. When the subsequent search was limited to Systematic Reviews, Randomized Controlled Studies, and Meta-Analysis and Clinical Trials, 313 articles were selected for further analysis.

Conclusions: Review of the literature reveals that most dentate and partially dentate patients do not have coincident centric occlusion and maximal intercuspal position. There is support for coincidence between centric occlusion and maximal intercuspal position as the preferred occlusal relationship in complete mouth rehabilitations. The literature does not report conclusive evidence of adverse prosthodontic outcomes with complete rehabilitations in centric occlusion or maximal intercuspal position in a healthy population. However, there is support for an association between centric occlusion-maximal intercuspal position discrepancies and occlusal instability as well as temporomandibular joint disorders. Hence, it is concluded that partially and completely dentate patients requiring complete mouth rehabilitation should be restored in centric occlusion.

Keywords: Intercuspal position; centric relation; prosthodontic rehabilitation; occlusion; maximal intercuspal position.

What Materials and Reproducible Techniques May Be Used in Recording Centric Relation? Best Evidence Consensus Statement.

Mathew T. Kattadiyil, ***Abdulaziz A. Alzaid***, Stephen D. Campbell.

Journal of Prosthodontics. 2021 Apr;30(S1):34-42.

Purpose: The purpose of this Best Evidence Consensus Statement was to evaluate the existing literature relative to two focus questions: What are the techniques used and their reproducibility in recording centric

relation (CR) in a dentate and partially dentate population and what effect do different recording materials have on the reproducibility of CR?

Materials and Methods: Keywords used in the initial search were: CR, interocclusal records, CR accuracy, CR reproducibility, and CR technique. The search was then limited to Systematic Reviews, Randomized Controlled Studies, Meta-analyses, and Clinical Trials.

Results: Initial search related to the selected search terms resulted in more than 3500 articles. When subsequent search was limited to Systematic Reviews, Randomized Controlled Studies, and Meta-Analysis and Clinical Trials, this resulted in 291 articles selected for further analysis.

Conclusions: Techniques using chin point guidance, bimanual manipulation, power centric, Gothic arch tracing, leaf gauge, and anterior deprogramming devices to record CR can all be comparable in precision and clinical accuracy in regards to clinical relevance. Practitioner experience and familiarity with a particular technique is critical for accuracy when recording CR. Polyvinyl siloxane and polyether consistently performed better in the broad range of studies on recording materials. Virtual capture of CR could serve as a comparable recording medium but requires further clinical study.

Keywords; Centric relation; interocclusal records; centric relation accuracy; centric relation reproducibility; centric relation technique.

The Effectiveness of Students' Performance in Preclinical Fixed Prosthodontics Course in Predicting Subsequent Clinical Performance.

Nadia S. Al-Angari, Atheer S. Aldaham, Emad Masuadi, ***Muhammad Nadeem, Lubna Alkadi.***

Journal of Prosthodontics. 2021 Apr 12, ahead to print.

Purpose: To evaluate the correlation between students' achieved grades in a preclinical fixed prosthodontics course and their performance in the same discipline's clinical courses.

Materials and methods: This study was conducted in 2019 on 76 students who passed all preclinical and clinical fixed prosthodontics courses. Their final examination grades in preclinical and clinical prosthodontics courses were compiled and made anonymous. The Statistical Package for the Social Sciences (SPSS Version 23) was used to analyze the data. Descriptive statistics and correlation coefficient were used to assess the relation between preclinical and clinical grades.

Results: A statistically significant positive correlation existed between the students' preclinical and combined clinical final examination grades ($r = 0.45$, $p < 0.001$). In relation to sex, females showed a significantly higher correlation ($r = 0.56$, $p = 0.001$) compared to males ($r = 0.25$, $p = 0.1$). In addition, students' clinical grade prediction from their preclinical performance was 20.5%.

Conclusion: These findings emphasize the importance of preclinical courses and suggest that maximizing preclinical years' efforts can reflect positively on students' competence in their future clinical practice.

Keywords: Prosthodontics; assessment; clinical competence; clinical skills; curricula; dental education; patient simulation.

Effect of Artificial Gastric Acid and Brushing on the Optical Properties and Surface Hardness of Colored Zirconia.

Alofi S. Raneem, Albani M. Ragad, Alhaizan A. Yasmeen, ***Adeem S. Alofi.***

International Journal of Medical Dentistry. 2021 Mar;25(1):49-54.

Objectives: To assess the effect of artificial gastric acid with and without brushing on color stability, surface gloss and surface hardness of colored zirconia.

Materials and methods: Monochromatic zirconia (A) and zirconia colored before sintering (B) were milled into discs and sintered. Each material was divided into three groups (n=11/group): control (1), acid exposure (2), acid exposure and brushing (3). All groups, the control one excluded, were emerged into artificial gastric acid, rinsed with water, and stored in distilled water. Groups A3 and B3 were subjected to brushing. Changes in color, gloss and hardness were measured.

Results and discussion: There was a significant difference in color after acid exposure with or without brushing in both materials ($p<0.05$). Surface hardness was significantly lower when exposed to acid with or without brushing, compared to the control group ($p=0.0001$). Surface gloss shows no statistical difference comparatively with the control groups ($p>0.05$). When comparing monochromatic and colored zirconia, no significant difference was found in any parameter.

Conclusions: zirconia exposure to gastric acid with or without brushing will affect its color and lower its surface hardness, regardless the application of coloring stains.

Keywords: dental erosion, gastric acid, zirconia, hardness, color, gloss.

Preprosthetic Surgeries and its Protocol for Complete Dentures: A Review.

Hanan Ghazi Shanab, Farheena Ustad, Ghufran Ibrahim Abdulrahman Alayfan, Shaeesta Khaleel Ahmed Bhavikatti, Abdul Rhman Mohammedy Alyousef, ***Abdul Rahman Yousuf Abdulrahman Alshebel***.

International Journal of Pharmaceutical Research. 2021 Mar;13(1):5239-43.

Abstract: In day-to-day dental practice many patients needing an ideal prosthodontic treatment plan are left dissatisfied due to unfavorable oral tissue conditions which cannot be improved without resorting to preconditioning of the oral tissues by means of surgical procedures. The Preprosthetic surgeries is performed to Prepare the soft and hard tissues of the upper and lower jaws to receive a comfortable prosthesis that will restore oral function, aesthetics, and facial form. Preprosthetic surgeries are group of soft and hard tissue procedures carried out in the oral cavity to create an architecture which is conducive for fabricating prostheses and improving their long-term prognosis. These procedures serve the needs of prosthodontists who plan replacements for missing teeth and associated tissues. A complete denture must restore function of the jaws (mastication of food, speech and swallowing) which can be achieved by creating proper supporting structures for subsequent replacement. Furthermore, prevent damage to adjacent structures by creating favorable tissue structures using surgical interventions like for example in a severely bony deficient mandible, it is essential to provide bone bulk for strength and protection for the neurovascular bundles in bony dehisced mandibular canals. In the maxilla, ideally an arched palatal vault has to be provided.

Keywords: Preprosthetic Surgeries; prosthodontic; prosthesis; complete denture.

Quality and Readability Assessment of Internet-Based Information on Common Prosthodontic Treatments

Abeer Alshehri, Nasser Alghofaili, Renad ALshunaiber, Lubna Alkadi

International Journal of Prosthodontics. Online published Feb 2021, ahead to print.

Purpose: To evaluate the readability and quality of patient-oriented information online among different common prosthodontic search areas using multiple quality and readability assessment tools.

Materials and Methods: The prosthodontic keywords most commonly searched by patients on the internet were included. The search was performed through two online search engines (Google and Yahoo) to create the study sample. The first 50 websites listed by each search engine were chosen for each keyword. The quality of each website's information was evaluated using the DISCERN questionnaire and the Health on the Net (HON) criteria. Readability assessment was performed using the Flesch-Kinkaid Reading Grade Level (FKRGL) and the Flesch Reading Ease Score (FRES).

Results: A total of 225 websites were included in the study. The median score for the DISCERN instrument indicated poor information quality. A significant difference was found between the educational and commercial websites in both quality and readability. Overall, the median readability indices showed that the websites' information was difficult to read.

Conclusion: Internet-based health information on different prosthodontic treatments is difficult to read and poor in quality and readability. It is necessary for health care providers to establish and promote websites that have reliable, high-quality information about common prosthodontic treatments.

Biological Outcome and Stress Analysis of Angled Abutment on Implant Supported Single and Partial Denture Prostheses.

Shar Al Tuwaijri.

The Open Dentistry Journal, 2021 Jan; 15, Ahead to print

Aim: To study the biological outcomes of angled abutments when used to restore single or partial fixed implant supported prosthesis.

Methodology: An online search using Medline (Ovid) and PubMed databases was conducted using terms and combinations such as; angled abutment, bucco-lingual angulation, biological complication, marginal bone loss and implant supported fixed partial prosthesis. The focus of the study was to evaluate the effect of bucco-lingual/palatal angulation with implant supported single or partial FPD, which was conducted through specific inclusion and exclusion criteria.

Results: The search revealed a total of 8 human *in vivo* and 10 *in vitro* studies. Of that, three *in vivo* studies were excluded and two from *in vitro* studies.

Conclusion: According to the available studies, no significant bone loss was associated with single and partial implant supported prostheses when angled abutments are used to correct the tilted buccolingual implants. The results should be evaluated carefully due to the short follow up duration of the clinical studies; further long term follow up studies are needed. In cases where implants were misplaced, the best is to use platform switched implants with a smooth neck, maintain at least a minimum of 2 mm or more of buccal bone and utilize the lowest angulation values as possible.

Keywords: biological outcom, Angled abutment, Dental implant, Supported crown, Implant supported FPD, Buccolingual angulation.

CAD-CAM Endocrowns Vs. Crowns.

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EC Dental Science, 2020;19(2):1-7.

Introduction: Endocrown is a one-piece restoration that takes strength from the pulp chamber of root canal treated tooth. The basic concept behind the endocrown is that it develops a bonded all-ceramic restoration that takes its strength partially from the pulp chamber and is metal-free. For a very grossly decayed tooth, using a post and taking strength from the canals that are already weakened after endodontic treatment leads to decreased strength of the tooth, and hence endocrowns are a good alternative.

Aim of Work: This review article talks about endocrowns and their advantages over the conventional full-coverage crowns.

Methodology: This review is a comprehensive research of PUBMED from 1999 - 2018.

Conclusion: Endocrowns are an easier and conservative alternate for full coverage crowns. Glass ceramic restoration when used with CAD-CAM make a monolithic restoration that has more strength, and because of the butt joint there is better distribution of forces along the joint and the axial walls and hence reduces the force applied on the pulpal floor. The endocrowns are a perfect example of bio integration and are a good alternative to restore grossly decayed posterior teeth.

Keywords: Endocrowns; Full-Coverage Crowns; Monolithic Preparation; Cervical Sidewalk; CAD-CAM

Various Classes of Removable Partial Dentures: A Study of Prevalence Among Patients Attending a Dental and Educational Institute in Riyadh, Saudi Arabia

Nadia Al-Angari, Saeed Algarni, Anas Andijani, Abdulwahab Alqahtani.

The Saudi Dental Journal. Online published 29 May 2020, ahead to print.

Purpose: Knowledge about the most prevalent types of Kennedy classifications is of great value and will enlighten dental students, dental technicians, and practitioners regarding the treatment needs of their patients, ultimately leading to better treatment outcomes. The aim was to determine the prevalence of various Kennedy classifications among patients attending clinics at the College of Dentistry at King Saud bin Abdulaziz University for Health Sciences and King Abdulaziz Dental Center, National Guard Health Affairs, who were seeking treatment for partial edentulism.

Methods: An observational cross-sectional study was conducted by visualizing cast models for partially edentulous patients. Kennedy classification, age, gender, and treatment design were recorded from the lab request sheets that were attached to the casts in the labs at both the College of Dentistry at King Saud bin Abdulaziz University for Health Sciences and King Abdulaziz Dental Center, National Guard Health Affairs. The statistical analyses were performed with SPSS version 20.0 utilizing frequency and Pearson's and Spearman's correlation tests.

Results: Kennedy Class I (45.0%) was the most prevalent pattern in both dental arches, followed by Class III (26.2%). Next was Class II (23.3%), while Class IV was the least prevalent (5.4%).

Conclusion: Kennedy Class I was the most noted classification in our patient population. As age increases, there is an increased tendency toward Class I and II.

Keywords: Removable partial denture, Kennedy classification, Partial edentulism

Integration of Intraoral Scanning and conventional processing to fabricate a definitive obturator: A dental technique

Hatem Alqarni, Mathew T. Kattadiyil, Ruty Aponte-Wesson, Mohammed Alfaifi, Hussain Alsayed.

Journal of Prosthetic Dentistry, Online published 25 Sep 2020, ahead to print.

Abstract: Clinical challenges occur when treating patients with maxillofacial defects with digital technology. This report describes a technique that combines intraoral scanning to fabricate a milled record base along with the conventional processing to fabricate a definitive maxillary obturator prosthesis.

Survival Rates of Fixed Partial Dentures: A Systematic Review and Meta-Analysis of Randomized Controlled Trials

Thuraya Abdul Rahim Basudan, Malak Ali Al Ghamdi, Mohammed Hassan Muhanna, Kunuz Saleh Alghamdi, Afaf Ateq Alrashidi, Rahaf Yousif Alahmadi, Abdulhmeed Abdulmohsen Alodib, Shahd Osama Shaban, Heba Faisal Ismaiil, Abdulhadi Mohammed Albandar, ***Menwer Awaed Alenazi***, Iman Faisla Bakawasa.

EC Dental Science, 2020; 19(1):1-10.

Abstract: Teeth are an integral part of the facial structure and in most cultures they symbolize youth, health, beauty, and dignity. Loss of teeth can, therefore, create physical and functional problems and missing teeth can cause psychological and social disturbances. Thus, the desire to replace missing teeth with an implant having a long durability has become an urging need. For that, we have performed a comprehensive search for studies assessing the survival fixed partial dentures (FPDs) with at least five years of follow up. Only randomized controlled trial published in the last 10 years were included, with no limits on language or age of participants. A total of eight studies were finally included following screening of the 2042 preliminary retrieved non-duplicates. The meta-analysis results showed an overall 5-year survival of 99.13% and a 10-year survival of 95.38%. There was no heterogeneity detected in neither of these analyses. This high survival rates of FPDs make them a good choice in the indicated patients.

Keywords: Survival, Implants, Fixed Partial Dentures, FPDs

Prosthodontic Management in Endodontics

Salah A. Yousief, ***Faisal Saleh Alkhamis, Abdulkareem Saad AlGhamdi, Saud Abdulaziz Alsaid, Waleed Ahmad Alkhelaifi, Muhannad Abdullah R Alotaibi, Fahad Awwadh Alotaibi.***

EC Dental Science, 2020;19(2):1-7.

Introduction: The restoration of endodontically treated tooth is an essential aspect in dental practice, and its longevity has been dramatically enhanced by advanced development made in endodontic and prosthodontic restorative procedures and wide range of treatment option of varying complexity. A large number of endodontically treated teeth are restored to their original form and function with use of crown, bridge and most commonly intraarticular devices such as convention or prefabricated post systems. Since endodontically treated teeth suffer an extensive loss of crown structure, the post helps retain the coronal restoration. Thus, coronal restoration and posts can positively influence the long-term prognosis after the root canal treatment.

Aim of the Study: The article reviews the emphasis on significant decision-making elements and factors associated after root canal treatment, proper post selection and restoration of endodontically treated teeth.

Methodology: The review is comprehensive research of PUBMED and Medline since the year 1972 to 2014.

Conclusion: Most endodontically treated teeth require a post and core build-up for restoring the teeth to optimum health and function. Thus, selection of appropriate post and core system is utmost essential to satisfy interrelated biologic, mechanical and aesthetic factors. The prognosis of endodontically treated teeth depends not only successful root canal procedure but also on the remaining coronal and radicular tooth tissue, definitive restoration, and its properties as much similar to tooth tissue as possible, effective post adhesion. These are the most critical factors to decide the clinical performance of endodontically treated teeth.

Keywords: Endodontically Treated Teeth, Post, Core, Cement, Restoration

Oral health–related quality of life and oral hygiene practice of adults with fixed dental prostheses in Riyadh, Saudi Arabia

Abeer Alrumyyan, Shahad Quwayhis, Shahad Meaigel, Raghad Almedlej, Rana Alolaiq, Raneem Bin Nafesah, Malak Almutairi, Shahd Alzamil.

Journal of International Society of Preventive and Community Dentistry, 2020:10(1);62-68.

Objectives: Missing teeth are routinely replaced with fixed dental prostheses (FDPs); thus, knowing the patient's oral health–related quality of life (OHRQoL) after placement of FDP and factors affecting their quality of life in addition to their oral hygiene practices is important. This study aimed to measure OHRQoL with FDPs and oral hygiene practices of adults in Riyadh, Saudi Arabia.

Materials and Methods: A survey was distributed in hard and soft copy forms. Target subjects were adults older than 18 years with FDP and living in Riyadh. The questionnaire contained four domains: demographic data, medical history, characteristics of the prostheses and oral hygiene practices, and Oral Health Impact Profile (OHIP)-14 questionnaire, which measures OHRQoL.

Results: The study included 528 subjects. More than half of the participants (56.6%) had poor OHRQoL, which was associated with female gender, full-time employment, and low income. The presence of toothache, periodontal diseases, oral abscess, and broken teeth were all associated with poor OHRQoL. Participants with diabetes were also found to have poor OHRQoL. As for oral hygiene practices, 47% of subjects did not receive oral hygiene instructions after the placement of their FDP. It was also found that 53.4% of the study population brush only once daily.

Conclusion: Many factors can have an influence on OHRQoL. Both dentist and patient awareness regarding postoperative oral hygiene instructions should be increased to ensure the durability of the prosthodontic appliances and improve patients' OHRQoL.

Keywords: Fixed dental prostheses, oral hygiene practice, quality of life

Immediate load of mandibular overdenture using mini implants: A case report

Mohammed Alsaloum

International Journal of Medical Dentistry, 2020 Sep;24(3):446-449.

Abstract: Transitioning patient from failing dentition to fixed implant-supported prosthesis requires careful planning and well-sequenced treatment. However, patients are frequently uneasy about using a removable prosthesis, especially the mandibular one. This case report presents the option of placing two mini implants and immediately loading them to retain mandibular overdenture for a period of time. The technique, performed in the surgical stage, allows for the use of immediate complete denture as interim complete overdenture.

Keywords: immediate implants, interim prosthesis, mini implants, overdenture

The Use of Gothic Tracer in an Edentulous Patient with Bilateral Condylar Aplasia: A Case Report

Abdulkader Al Jarrah, Mohammed Alsaloum, Lana Alaskar

International Journal of Medical Dentistry, 2020 Sep; 24(3):442-445.

Abstract: Complete aplasia of mandibular condyle is a rare condition, and its prosthodontic management, especially in edentulous patients, is a clinical challenge. The present clinical report describes the successful prosthodontic management of an edentulous patient with condylar aplasia utilizing gothic arch tracer for centric relation record.

Keywords: central bearing, complete denture, condylar aplasia, gothic arch

Management considerations for the patient and the prosthodontist during coronavirus disease-2019 pandemic (Letter to Editor)

Rajkiran Chitumalla, Abdulkader Aljarrah, Swapna Munaga

Saudi Journal of Oral Sciences, 2020 Sep-Dec;7(3):216-217.

No Abstract.

A Technique to Increase Retention of all Metal and Porcelain Fused to Metal Crowns to Cast Post and Core Restorations

Faisal F. Alzeghaibi, Rymah A. Alrashid, ***Shahad E. Quwayhis***, Mohammed A Al Rashed.

International Journal of Medical Research & Health Sciences, 2019 Oct; 8(10): 98-101.

Abstract: Retention prevents dental restoration from being dislodged along its path of insertion. However, classic retentive factors are not always possible to implement in fixed prosthodontics. Therefore, it may be helpful to utilize non-conventional methods to enhance retention in situations where retention can't be

obtained from primary and secondary retentive factors. This article describes a technique to increase crown retention to cast post and core by using a horizontal retentive post to lock the crown to the cast post and core.

Keywords: Retention, Cast, Post, Core, Crown, Technique

Computer-engineered complete denture fabrication with conventional clinical steps: A technique to overcome protocol limitations

Hatem Alqarni, Abdulaziz AlHelal, Mathew T. Kattadiyil

The Journal of Prosthetic Dentistry, 2019 Nov;122(5):430-434.

Abstract: Treating patients with complete edentulism presents unique clinical challenges. With advancements in digital dentistry and computer-engineered complete denture fabrication, new clinical challenges occur. This report describes a modification to a computer-engineered complete denture maxillomandibular relation–recording protocol to manage a patient with an increased interarch distance.

Quality of Communication between Dentists and Dental Laboratory Technicians for Fixed Prosthodontics in Riyadh, Saudi Arabia

Huda Tulbah, Eman AlHamdan, Amal AlQahtani***, Asma AlShahrani***, Mona AlShaye

The Saudi Dental Journal, 2017 Jul;29(3):111-116.

The fabrication of a clinically acceptable dental prosthesis requires proper communication between the dentist and the dental technician. Prosthodontic educators have been concerned with this interaction and communication. Fixed prosthodontics laboratories revealed that the technicians are often dissatisfied with the information provided in work authorizations.

Objective: To evaluate the quality of communication between dentists and laboratory technicians via work authorizations for fixed prosthodontics in both governmental and private dental laboratories in Riyadh area from the technician's perspective.

Methods: A sample of 66 dental laboratories, including all government dental laboratories and a selected number of randomly chosen private dental laboratories from each district of Riyadh (40%), participated in the survey. A questionnaire was developed to include questions related to the following areas of work authorization: clarity and accuracy of instructions, patient information, type of prosthesis, choice of materials, design and shade of the prosthesis and type of porcelain glaze. The questionnaire was answered in a face-to-face interview by technicians who were qualified in fixed prosthetic work. Data were analyzed through parametric tests (*T*-test and one-way ANOVA) to identify significant values ($P < 0.05$).

Results: This survey showed a lack of communication between dentists and dental laboratories regarding the following: marginal design, pontic design, staining diagram, type of porcelain and glaze needed for the prosthesis. Significant differences were observed between the government and private dental laboratories. There was a greater lack of communication between the dentists and government laboratory technicians in Riyadh. There was no statistically significant difference between private laboratories of different areas in Riyadh city ($P < 0.05$).

Conclusion: The quality of communication between dentists and dental technicians in Riyadh can sometimes be inadequate, and governmental laboratories have a lower level of communication.

Keywords: Dentist, Dental technician, Fixed prosthodontics, Communication, Work authorization form

The Effect of Color Training of Dental Students' on Dental Shades Matching Quality

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Journal of Esthetic and Restorative Dentistry, 2017 Sep;29(5):346-351.

Objective: To assess the effect of color training on the dental shade matching quality of dental students of both gender and to study the need to include lectures and exercises about shade selection in the undergraduate dental curriculum.

Materials and methods: One hundred and twenty junior dental students from the College of Dentistry at King Saud University participated in the present study and were distributed randomly into four testing groups. They were asked to match the color of four target shade tabs from the VITA Linearguide 3D-MASTER. Group 1 attended a brief lecture and a training exercise about dental shade matching, Group 2 only attended the lecture, and Group 3 only performed the training exercise. Group 4 did not participate in the lecture or the training exercise and served as a control. Exact matching rates were calculated and analyzed to determine the pre- and post-test matching values. Three way repeated measures analysis of variance, paired t test, and independent t-test were used to compare shade matching quality, with a significance level of $p < 0.05$.

Results: There was a significant difference between the pre- and post-test values for the students' dental shade matching qualities for all of the test groups.

Conclusion: The effectiveness of the dental shade matching training about color and dental shade matching for improving the students' shade matching quality was proven for both genders.

Fracture Toughness of Two Lithium Disilicate Dental Glass Ceramics

Lubna Alkadi, N. Dorin Ruse

The Journal of Prosthetic Dentistry, 2016 Oct;116(4):591-596.

Statement of problem: IPS e.max CAD and IPS e.max Press (Ivoclar Vivadent AG) are lithium disilicate glass ceramics marketed as interchangeable materials indicated for the same clinical uses. However, different crystal sizes of lithium disilicate are formed during the processing of each of these materials, a factor that could lead to significantly different mechanical properties. As mechanical failure is always associated with a crack-initiation/crack-propagation process, fracture toughness (K_{IC}) values could be useful in comparing different ceramics and possibly predicting clinical performance.

Purpose: The purpose of this in vitro study was to determine and compare the K_{IC} of IPS e.max CAD and IPS e.max Press.

Material and methods: The notchless triangular prism (NTP) specimen K_{IC} test was used to determine and compare the K_{IC} of IPS e.max Press and IPS e.max CAD. Twenty 6×6×6×12-mm NTP specimens of each material were prepared. IPS e.max CAD blocks were cut, ground, and then crystallized, while IPS e.max Press specimens were prepared by pressing IPS e.max Press ingots into molds obtained from 6×6×6×12-mm wax prisms, using the lost wax technique. Each specimen was mounted into a specimen holder, and custom grips were used to attach the specimen holder assembly to a computerized universal testing machine (model 4301; Instron Canada, Inc). The assembly was loaded in tension at a crosshead speed of 0.1 mm/min, and the K_{IC} value was calculated based on the recorded maximum load at fracture. Fractured surfaces were characterized using scanning electron microscopy (SEM). Results were statistically analyzed using Weibull statistics and the Student t test (α=.05).

Results: Significantly (P<.05) higher K_{IC} value was determined for IPS e.max Press than for IPS e.max CAD and, based on the Weibull modulus (m), IPS e.max Press was also more reliable. Fractured surfaces, characterized by SEM, showed a marked difference between the 2 materials, suggesting a more complete crystallization in IPS e.max Press, which was most likely responsible for the higher K_{IC} determined.

Conclusion: Within the limitations of this in vitro study, the results suggest that IPS e.max Press is superior to IPS e.max CAD with regard to the K_{IC} and characteristic Weibull parameters.

Design and Fabrication of Facial Prostheses for Cancer Patient Applying Computer Aided Method and Manufacturing (CADCAM)

Tengku Noor Daimah Tengku Din, Nafij Jamayet, ***Zainul Ahmad Rajion***, Norhayati Luddin, Johari Yap Abdullah, Abdul Manaf Abdullah, Suzana Yahya

AIP Conference Proceedings 2016 Dec; 1791(1):020003.

Abstract. Facial defects are either congenital or caused by trauma or cancer where most of them affect the person appearance. The emotional pressure and low self-esteem are problems commonly related to patient with facial defect. To overcome this problem, silicone prosthesis was designed to cover the defect part. This study describes the techniques in designing and fabrication for facial prosthesis applying computer aided method and manufacturing (CADCAM). The steps of fabricating the facial prosthesis were based on a patient case. The patient was diagnosed for Gorlin Gotz syndrome and came to Hospital Universiti Sains Malaysia (HUSM) for prosthesis. The 3D image of the patient was reconstructed from CT data using MIMICS software. Based on the 3D image, the intercanthal and zygomatic measurements of the patient were compared with available data in the database to find the suitable nose shape. The normal nose shape for the patient was retrieved from the nasal digital library. Mirror imaging technique was used to mirror the facial part. The final design of facial prosthesis including eye, nose and cheek was superimposed to see the result virtually. After the final design was confirmed, the mould design was created. The mould of nasal prosthesis was printed using Objet 3D printer. Silicone casting was done using the 3D print mould. The final prosthesis produced from the computer aided method was acceptable to be used for facial rehabilitation to provide better quality of life.

Clinical Performance of Implant Supported All-Ceramic Restorations using Ceramic Abutments: a 1–3 Year Follow up Study

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Clinical Oral Implants Research, 2015 Mar;7(3):31-44.

Background: Implant-retained ceramic abut-ments are used to achieve better esthetic crowns with optimum mucogingival esthet-ics. This study aimed to evaluat clinical per-formance of implant-supported all-ceramic restoration regarding survival and periodontal parameters, crestal bone loss, prosthetic com-plications, esthetics and patients' satisfaction.

Methods: 35 patients were examined and divided into two groups: G1 (n=15) where implants were restored using alumina abutments and IPS-Empress all-ceramic crowns and G2 (n=20) where implants restored using titanium abutments and metal-ceramic crowns. Patients were examined for periodontal parameters (plaque index, gingival index, bleeding index, pocket prob-ing depth, mucosal recession, and width of kera tinized gingival). Radiographic bone loss around implants, aesthetics, technical complications and patients' satisfaction were investigated and data analyzed using Wilcoxon's signed ranked test and multivariate general linear model (P<0.05).

Results: Prostheses were examined at 3.17±1.57 years mean follow-up time of Implants survival rate, abutments and restorations was 100% in both groups. Only one statistically significant difference (P<0.05) was found in the bleeding index (P<0.05) between both groups.

Conclusions: Alumina ceramic and titanium abutments exhibited the same survival, technical and esthetic outcomes over 3 years period. However, differences existed in bleeding index.

Keywords: Dental implants, prosthetics, restorations, abutments

A Clinical Investigation of the Relationship between the Quality of Conventional Complete Dentures and the Patients' Quality of Life

Sara A. Alfadda, ***Hayam A. Al-Fallaj, Hajar A. Al-Banyan, Ruba M. Al-Kadhi***

The Saudi Dental Journal, 2015 Apr;27(2):93-98.

Objective: The purpose of this study was to determine whether there is a correlation between the clinical quality of conventional complete dentures and patient quality of life.

Materials and methods: This study included a random sample of 32 completely edentulous patients (15 males and 17 females) who were treated with conventional complete dentures. Using a validated questionnaire, three investigators evaluated the dentures independently on the basis of seven clinical parameters: esthetics (lip support and lower lip line), retention and stability of the maxillary and the mandibular dentures, and occlusion. Patients completed the validated Oral Health Impact Profile-20 (OHIP-20) questionnaire. Correlations were determined by using the point-biserial correlation coefficient.

Results: Clinicians rated the overall clinical quality of the dentures satisfactory in 80.3% of patients. The mean (±standard deviation) total OHIP-20 score was 56.3 ± 15.9 out of a possible 120 maximum. A statistically significant negative correlation was found between the stability of the maxillary and mandibular dentures and the total OHIP-20 score (p = 0.009 and 0.0023, respectively). A negative correlation between the total OHIP-20 score and the retention of the mandibular denture approached significance (p = 0.092). Esthetics, retention of the maxillary denture, and occlusion were not correlated with patient quality of life (p > 0.169).

Conclusion: Stability of the maxillary and mandibular dentures is the denture quality parameter that can most significantly affect patient quality of life. **Keywords:** Quality of life, Complete dentures

Shear Bond Strength between Alumina Substrate and Prosthodontic Resin Composites with Various Adhesive Resin Systems

Yousef A. AlJehani, ***Jagan K. Baskaradoss, Amrita Geevarghese, Marey A. AlShehry,*** Peeka K. Vallittu

BMC Oral Health, 2015 May;15:55.

Background: With the increase in demand for cosmetics and esthetics, resin composite restorations and all-ceramic restorations have become an important treatment alternative. Taking into consideration the large number of prosthodontic and adhesive resins currently available, the strength and durability of these materials needs to be evaluated. This laboratory study presents the shear bond strengths of a range of veneering resin composites bonded to all-ceramic core material using different adhesive resins.

Methods: Alumina ceramic specimens (Techceram Ltd, Shipley, UK) were assigned to three groups. Three types of commercially available prosthodontic resin composites [BelleGlass®, (BG, Kerr, CA, USA), Sinfony® (SF, 3 M ESPE, Dental Products, Germany), and GC Gradia® (GCG, GC Corp, Tokyo, Japan)] were bonded to the alumina substrate using four different adhesive resins. Half the specimens per group (N = 40) were stored dry for 24 hours, the remaining were stored for 30 days in water. The bonding

strength, so-called shear bond strengths between composite resin and alumina substrate were measured. Data were analysed statistically and variations in bond strength within each group were additionally evaluated by calculating the Weibull modulus.

Results: Bond strengths were influenced by the brand of prosthodontic resin composites. Shear bond strengths of material combinations varied from 24.17 ± 3.72-10.15 ± 3.69 MPa and 21.20 ± 4.64-7.50 ± 4.22 at 24 h and 30 days, respectively. BG resin composite compared with the other resin composites provided the strongest bond with alumina substrate ($p < 0.01$). SF resin composite was found to have a lower bond strength than the other composites. The Weibull moduli were highest for BG, which was bonded by using Optibond Solo Plus adhesive resin at 24 h and 30 days. There was no effect of storage time and adhesive brand on bond strength.

Conclusion: Within the limitations of this study, the shear bond strengths of composite resins to alumina substrate are related to the composite resins.

Keywords: Adhesive resins, Prosthodontics resin composites, Shear bond strength

In vitro evaluation of the marginal and internal discrepancies of different esthetic restorations

Amal Abdelsamad Sakrana

Journal of Applied Oral Science, 2013 Dec;21(6):575-580.

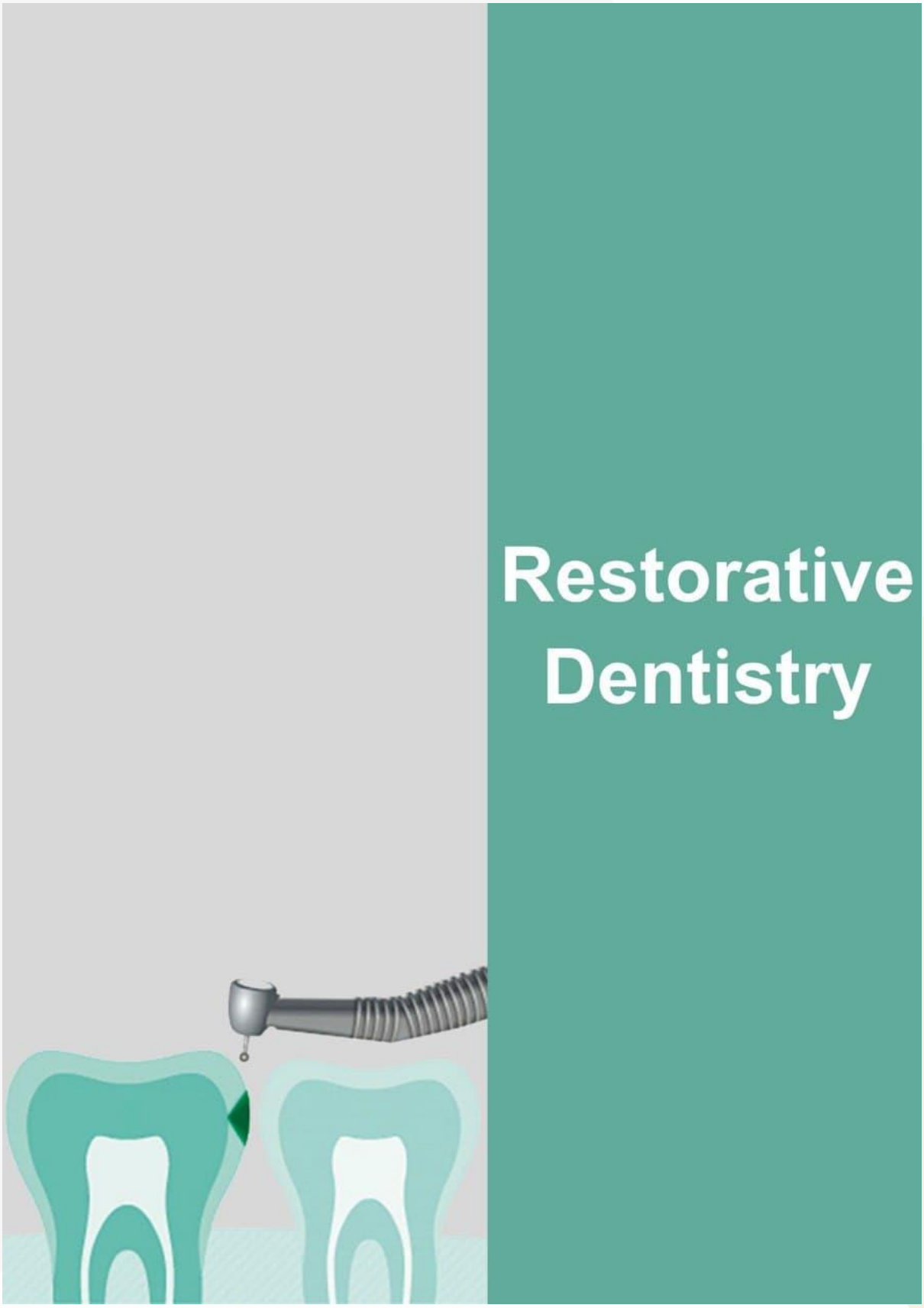
Objective: This study examined the fit of two types of all-ceramic single crowns and indirect composite resin full coverage crowns.

Material and Methods: Thirty intact human mandibular first premolars were selected for this study and prepared using a machine to standardize the dimensions and randomly divided into 3 groups. Slip cast (IC) (In-Ceram Zirconia, Vita Zahnfabrik), copy-milled zirconia (CM) (ICE, Zirkonzahn) and indirect composite resin crowns (NECO, HeraeusKulzer, Hanau, Germany), (N=30, 10 per group) were fabricated according to each manufacturer's recommendations. Before cementation, discrepancies were measured at the marginal zone in each crown. Crowns were then cemented with G-Cem capsule self-adhesive luting cement (GC Corporation, Tokyo, Japan). Four positions were marked for each zone (mid-facial, mid-mesial, mid-distal, and mid-lingual) and three measurements were made at each of the four positions yielding to a total of 12 measurements per crown before and after cementation. The measurements were performed at a different magnification using a stereo microscope (SZ11, Olympus, Japan). Marginal, axial and occlusal zone discrepancies (µm) were evaluated after cementation. The data were statistically analyzed using two-way ANOVA and Tukey's test.

Results: Before cementation, significantly less marginal discrepancies were noted compared with after cementation in all groups ($p<0.05$). No significant differences were found within each zone (Marginal= IC: 84.2, NECO: 95.22, CM: 84.22; Axial= IC: 54.22, NECO: 64.2, CM: 55.22; Occlusal= IC: 119.97, NECO: 129.18, CM: 121.15) in the three crown systems ($p>0.05$). Occlusal zone discrepancies were significantly higher than those of the marginal and axial zones in all groups ($p<0.05$).

Conclusions: Slip cast and copy-milled zirconia crowns showed comparable fit to composite resin crowns in all marginal, axial and occlusal areas.

Keywords: Dental marginal adaptation, Ceramics, Composite resins


Restorative
Dentistry

2.11 RESTORATIVE DENTISTRY

Pattern of Traumatic Dental Injuries Among Adults.

Anupama Ramachandran, ***Sulthan Ibrahim Raja Khan,*** Manal Al-maslamani, Jagan Kumar Baskaradoss.

Open Access Emergency Medicine, 2021 May; 13: 201-203.

Background: The etiology, presentation and management of traumatic dental injuries (TDIs) vary significantly between the adult and the younger population. Most epidemiological studies on TDIs have focused on the pediatric age group. This study aims to report and compare the distributions of TDIs among adults in a sub-population in India.

Methods: This prospective observational study was performed on 1562 consecutively selected patients (1218 males and 344 females) from a university dental hospital in India, between July 2014 and June 2018. The clinical examinations were performed by a single trained and calibrated endodontist. Only TDIs to anterior teeth were recorded (canine to canine in the maxilla and mandible) and classified using a modified version of the World Health Organization's (WHO's) classification. Periapical and panoramic radiographs were taken for all the subjects.

Results: A total of 1562 patients aged between 20 and 73 years, with a mean age of 36 years, were examined during the study period. The total number of teeth with TDIs was 3044. Males (78%) clearly outnumbered the females (22%) in all the age groups. The most common type of injury occurring in both the genders is uncomplicated crown fractures (male=31.0% and female=36.6%). Avulsion injuries are more likely to be seen by a dentist within 1 hour post-trauma. About two-third of the TDIs were caused by road traffic accidents (RTAs) followed by falls in about 20% of the patients.

Conclusion: Uncomplicated crown fracture was the most commonly observed type of TDI, and RTAs were the primary cause of TDI.

Keywords: adults, dental injuries, trauma

Antimicrobials in Dentistry.

Rana Alkattan, Luis Rojo, Sanjukta Deb.

Applied Sciences. 2021 Apr; 11(7):3279.

Abstract: Dental caries (decay) is caused by pathogenic bacterial species, which afflicts nearly a third of the world's population from early childhood to old age. Treatment of tooth decay often involves the use of filling materials to restore the cavity; however, if untreated, it can cause pain, infection and eventually lead to tooth loss. Since the oral environment is colonised by many different microorganisms, bacterial biofilms can form on these filling materials, contributing to secondary caries that can eventually lead to the failure of the dental restoration. Thus, preventing the formation of bacterial biofilms is an important strategy in the management of caries, which has led to research enabling antimicrobial capabilities in dental materials. Materials and pharmaceutical sciences are in a continuous race against microbial resistance but are trying to balance between beneficial biota associated with the oral cavity, and, of course, avoiding a harmful effect on tissues is challenging. This has, therefore, stemmed a substantial interest in both preventive and restorative measures that would enable limiting the formation of secondary caries, oral microbial biofilms, and the retention of tooth mineral. Thus, innovative strategies are being explored and here we present a review with a focus on strategies that can inhibit or limit the formation of bacterial biofilms.

Keywords: antibacterial monomers; dental materials; bactericidal; dentistry

Resin-based dental materials containing 3-aminopropyltriethoxy-silane modified halloysite-clay nanotubes for extended drug delivery.

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Dental Materials, 2021 Mar; 37(3):508-515.

Objective: To synthesize and characterize a novel resin-based dental material containing 3-aminopropyltriethoxysilane (APTES) surface-modified halloysite-clay nanotubes (HNTs) for long-term delivery of guest molecules.

Methods: The optimal concentrations of HNT (10, 15, 20 wt.%) and silane (0, 2, 4 vol.%sil) to be incorporated into the resin-based materials were determined (15 wt.%HNT, 4 vol.%sil) after assessment of the mechanical properties (DC%, degree of conversion; FS, flexural strength; FM, flexural modulus; and UTS, ultimate tensile strength). The HNTsil-powder was loaded with chlorhexidine (CHX) to evaluate the effect of the silanization on drug release. Resin-discs were prepared for the following groups: RES (resin), HNT (resin+15 wt.%HNT), HNTsil (resin+15 wt.%HNT silanized), HNT-CHX (resin+15 wt.%HNT loaded with chlorhexidine), HNTsil-CHX (resin+15 wt.%HNTsil-CHX), and 0.2 vol.%CHX (resin+0.2 vol.%CHX solution). Specimens were stored in water for 1, 3, 5, 10, and 15 days at 37 °C. Aliquots from each time point and the final 15-day specimens were evaluated for the zone of inhibition (ZOI) against *Streptococcus mutans*. CHX release was analyzed using spectrophotometry at absorbance of 300 nm. Data were statistically analyzed (α = 0.05).

Results: All materials presented similar DC%. Reduced FS but increased FM was detected for 20 wt.%HNT–4%APTES. Groups with 15 wt.% and 20 wt.%HNT with/without APTES presented higher values of UTS. Agar diffusion data indicates that the HNTsil-CHX had a greater ZOI than all other groups over 15 days. HNTsil-CHX had the highest absorbance for day 1 but presented similar values to other groups every time point after.

Significance: Silanization of nanotubes followed by encapsulation of chlorhexidine is a promising technique for long-term delivery of guest molecules. **Keywords:** Chlorhexidine, Inhibition zone, Nanotubes, Resin-based materials, Silanization

In vitro demineralization prevention by fluoride and silver nanoparticles when applied to sound enamel and enamel caries-like lesions of varying severities

Bader A. Aldhaian, Abdulrahman A Balhaddad, Areej A. Alfaifi, John A Levon, George J. Eckert, Anderson T. Hara, Frank Lippert.

Journal of Dentistry, 2021 Jan;104, 103536.

Objectives: To investigate the effect of fluoride and silver nanoparticles on the prevention of in vitro demineralization of sound enamel and enamel caries-like lesions of varying severities.

Methods: Caries-like lesions of different severities (1/6/15 days) were created in bovine enamel specimens. One group remained sound. All specimens were demineralized again using a partially saturated acetic acid solution. Mimicking the intra-oral retention of fluoride and silver in vitro, this solution was supplemented with fluoride (0/1/10 ppm) and/or silver nanoparticles (0/10 ppm) in a factorial design. Changes in lesion depth (ΔL) and integrated mineral loss (ΔΔZ) were evaluated by digital transverse microradiography. Data was analyzed using three-way ANOVA.

Results: Lesion severity significantly affected ΔΔZ and ΔL, after no treatment and after the treatment of fluoride and silver independently (p = 0.012 and p = 0.037, respectively). Fluoride and the fluoride × lesion

severity interaction were shown to be significant ($p < 0.001$) on ΔΔZ and ΔL. Silver nanoparticles significantly affected ΔΔZ ($p = 0.041$), but not ΔL ($p = 0.15$). The silver nanoparticles × lesion severity interaction was significant for ΔΔZ and ΔL ($p = 0.032$ and $p = 0.024$, respectively). No interaction was observed for ΔΔZ and ΔL between fluoride and silver ($p = 0.962$ and $p = 0.971$, respectively) as well as lesion severity and the use of fluoride and silver combined ($p = 0.722$ and $p = 0.158$, respectively).

Conclusion: Fluoride and silver nanoparticles had a significant effect on the prevention of in vitro demineralization of sound enamel and enamel caries-like lesions of varying severities.

Clinical significance: Fluoride and silver nanoparticles may potentially allow for more tailored caries prevention.

Keywords: Demineralization; Dental caries; Fluoride; Microradiography; Nanoparticles; Silver

Polymerisation of restorative dental composites: influence on physical, mechanical and chemical properties at various setting depths

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Materials Technology. Online published in 23 Oct 2020, ahead to print.

Abstract: To appraise influence of polymerisation of restorative dental composites on physical, mechanical and chemical properties at various setting depths. The cylindrical samples (5 mm diameter, 2.5 mm height, and n = 6) of microhybrid and nanohybrid composites were fabricated. Nanohardness was performed from the surface to the core of the sample in stages, i.e., stage 1–5. Additional chemical and physical characterisations of the study materials were performed. Differences in nanohardness, and W_{sl} and W_{sp} values were evaluated using analysis of variance ($P \leq 0.05$). Nanohardness was significantly affected between stages of dental composites ($P < 0.001$). Only Nanohybrid™ composite exhibited nearly same formation ratio of double bonds into polymeric carbon–carbon single bonds at different stages. The Nanohybrid™ composite exhibited lowest W_{sl} and W_{sp} parameters. Nanohybrid™ may have the potential to survive a harsh oral environment for a longer time compared with other composites.

keywords: Dental composite, nanohardness, polymerisation depth, degree of conversion, solubility, sorption,

Influence of Photodynamic therapy and different lasers Er, Cr:YSGG and Er,YAG on dentin conditioning bonded to conventional and bioactive cement.

Ali Alqerban, Muath Alrashed, Asma Alqerban, Ahmed Algohar, Nasser Alqhtani, ***Ali S. Aljhani***, Fahad Alharbi, Abdulaziz Samran.

Photodiagnosis and Photodynamic Therapy, 2021 Mar; 33:102107.

Aim: The aim of the present study was to evaluate the bond integrity of bioactive cement (BA_c) in contrast to conventional cement Calibra (C) after dentin treated with different surface conditioners (PDT, EYL, ECL) MATERIALS AND METHODS: Sixty non-carious permanent mandibular molars were disinfected and embedded in acrylic resin till cement-o-enamel junction. For homogeneity the buccal surface were grounded and polished. Samples were categorized into three main groups based on conditioning technique. Samples in group 1 and 2 dentin conditioned with Er,Cr:YSGG (ECL), group 3 and 4 surface

treated with Er:YAG (EYL) and group 5 and 6 treated with photodynamic therapy (PDT).On conditioned surface bonding agent was applied and light cured. Samples from group 1,3,5 were bonded to Calibra (C). Whereas, specimens in group 2,4,6 were conditioned with bioactive cement (BA_c) and subjected to ageing followed by shear bond strength testing (SBS) in universal testing machine. To detect significance difference between means of different groups analysis of variance (ANOVA) was performed followed by Tukey's post-hoc tests.

Results: The maximum SBS was displayed in group 1, dentin conditioned with ECL and bonded to C (20.23 ± 0.47 MPa). Whereas, group 6, PDT of dentin to BA_c demonstrated lowest bond integrity among experimental groups (12.97 ± 0.25 MPa). Bond strength of group 1, ECL-C (21.55 ± 3.08 MPa) and group 3 EYL-C (19.11 ± 0.65 MPa) were comparable ($p > 0.05$). Group 5 samples treated with PDT, MB-C (13.41±0.32 MPa) and group 6, MB-BA_c (12.97 ± 0.25 MPa) were also comparable ($p > 0.05$) CONCLUSION: BAc bonded to dentin after surface conditioning with ECL, EYL and PDT presented lower SBS in comparison to conventional cement C. Further studies are required to extrapolate the current findings.

Keywords: Bioactive cement; Calibra; Er,Cr:YSGG; Er:YAG; Photodynamic therapy; Shear bond strength.

Dental esthetic and the likelihood of finding a job in Saudi Arabia. A cross-sectional study

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Journal of Family Medicine Primary Care, 2020;9(1):276-781.

Background: Person's physical, dental appearance, and sexual identity are the characteristics most obvious to others. Prior researches suggest that visible sign of unhealthy dental status may lead to an individual's social or professional exclusion, so the aim of the study was to measure the influence of dental appearance on hiring managers' perception of intelligence, honesty and efficiency of job applicants in Saudi Arabia, and the likelihood of employment opportunity.

Materials and Methods: This cross-sectional study comprised 280 hiring managers. All participants were assigned randomly into two groups and received a survey with 10 different images for hypothetical job applicants. The images were digitally manipulated to have the Saudi national dress and to represent different dental conditions. The photos in both surveys were the opposite with no repetition except for 3 for reliability. Each evaluator randomly received one survey without knowing of the other. Participants were asked questions about their perception of honesty, intelligence, efficiency, and potential employability of the provided applicants' photos.

Results: There was no statistically significant difference in demographics data between the hiring managers assigned to both groups. Hypothetical job applicants with smiles affected by malocclusion were perceived to be less intelligent with *P* value = 0.0001, but there was no altered perception for honesty and efficiency. Moreover, applicants with caries were perceived to be less honest, intelligent, and efficient by the hiring managers with *P* value of 0.0007, 0.0011 and 0.0138, respectively. Applicants with dental imperfections compared to normal smile were 52% less likely to be employed. Conclusion: Dental appearance might alter people perception about the character of the affected person, and it might influence the judgment of future employers when screening for candidates; as a result, we recommend more educational programs for the public and hiring managers.

Keywords: Dental, esthetics, intelligence, perception

Twelve-month evaluation of the atraumatic restorative treatment approach for class III restorations: An interventional study

Madhuniranjanswamy Mahalakshmamma Shivanna, Shabana Ganesh, ***Sanjeev Balappa Khanagar***, Sachin Naik, Darshan Devang Divakar, Abdulaziz Abdullah Al-Kheraif, Chitra Jhugroo.

World Journal of Clinical Cases, 2020 Sep; 8(18): 3999-4009.

Background: Atraumatic restorative treatment (ART) may be appropriate for populations without accessibility and affordability. More data are required regarding the success rate of ART in anterior teeth.

Aim: To evaluate the clinical performance of restoring class III cavities in anterior teeth of permanent dentition using the ART approach.

Methods: A longitudinal interventional field study was carried out at two rural primary health centers, Tumkur district, India. A total of 54 teeth in 39 patients were evaluated for the survival rate of class III restorations in permanent anterior teeth using the ART approach in children and adult populations. Evaluation of ART restoration was carried out using Frencken J criteria, the mean procedure time, patient acceptance and reported pain severity during the ART approach were evaluated using a visual analog scale. Calculation of the cost of ART was also performed.

Results: The mean time taken to perform the ART procedure was 14.79 ± 5.8 min with the majority of patients reporting only mild pain. At 6 mo follow-up, 72.2% remained in a good state, but this reduced to 27% at 12 mo. The cumulative survival rate of the restorations was 94.4% at 6 mo and 80.9% at 12 mo follow-up. Estimation of the direct cost for a single class III restoration was 186.50 INR (2.64 USD).

Conclusion: ART may be a good comprehensive option for basic oral health care for underserved or inaccessible populations, and preventive care for patients.

Keywords: Atraumatic restorative treatment, Anterior teeth, Composite, Glass ionomer cement, Permanent dentition, Rural area

Influence of neuroticism on the prognosis of nanoceramic and microhybrid composite restoration: A comparative 1-year clinical study

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Journal of International Society of Preventive and Community Dentistry, 2020 Sep;10(5):613-619.

Aim: This study aimed to compare the clinical performance of nanoceramic and microhybrid-based composite restorations in adult patients with different personality traits.

Materials and methods: Patients in accordance with the inclusion and exclusion criteria were asked to complete the BFI (Big Five Inventory) questionnaire. Of a total of 323 patients, 124 (67 males and 57 females) patients were categorized into agreeableness and neuroticism traits and were included in the study. The patients were randomly divided into two subgroups: SG I A (*n* = 31) and II A (*n* = 31) for microhybrid composite (Spectrum TPH 3, Dentsply/DeTrey, Konstanz, Germany), SG I B (*n* = 31) and II B (*n* = 32) for nanoceramic composite restorations (Ceram X mono, Dentsply/DeTrey, Germany). At baseline, 6 and 12 months, the restorations were evaluated using the Modified USPHS (United States Public Health Service) evaluation criteria. The Pearson chi-square and the Fisher's exact test were used

to assess the difference between the personality traits and restorative material groups where a probability value of $P < 0.05$ was considered to be statistically significant.

Result: Most of the restorations scored alfa (A), whereas very few scored bravo (B) in all the subgroups. However, there were no charlie (C) or delta (D) scores. Overall, Spectrum TPH and Ceram x mono displayed superior performances in retention and postoperative sensitivity than all the other clinical parameters. Furthermore, Ceram x mono restorations showed more surface roughness than Spectrum TPH. No statistical differences in the restoration performance were found between both personalities and restorative material types.

Conclusion: Although neuroticism has an effect on various health outcomes, its impact on the clinical performance of composite restorations during the follow-up period was not observed. In addition, there was no difference between the performance of nanohybrid and microhybrid composite.

Keywords: Agreeableness; clinical performance; microhybrid composite; nanohybrid composite; neuroticism.

Knowledge on and Attitude toward Silver Diamine Fluoride among Saudi Dental Practitioners in Riyadh Public Hospitals

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Clinical, Cosmetic and Investigational Dentistry, 2020 Sep; 12:399-407.

Aim: This study assessed the knowledge on and attitude toward silver diamine fluoride among Saudi dental practitioners in Riyadh public hospitals.

Materials and Methods: A cross-sectional study was done, data were collected between July and October 2019 using a validated, and the published questionnaire was analyzed. A sample size of 278 public hospital dental practitioners in Riyadh, Saudi Arabia, was used. Participants who agreed to the study completed a 3-section questionnaire of Likert scale comprising multiple questions regarding demographic data, knowledge on silver diamine fluoride, potential, and actual use of SDF in dental practitioner's own professional life. Finally, respondents were asked about the future usage of SDF.

Results: A total of 278 Saudi dentists in Riyadh public hospitals completed the survey. The mean knowledge of SDF among participants was averagely 3.1. About half of the participants (50.4%) agreed that SDF could be used to arrest cavitated lesions. The majority of respondents showed a positive attitude toward SDF by accepting it as a good alternative treatment for individuals with behavioral problems or medical issues (>50%). The most frequently reported barrier to the use of SDF was black discoloration (55.39%). A high number of respondents have not experienced the application of SDF, in their practice (>60%), or dental school (65.5%). However, 57.9% expect an increase in the future use of SDF. The correlation between knowledge and attitude among different dental specialties was statistically significant ($P<0.05$). The restorative specialty was observed to have the highest mean of knowledge (3.26), while advanced education general dentistry had the highest mean (3.67) of attitude toward SDF.

Conclusion: The aim of the study was achieved as the knowledge on, and attitude toward silver diamine fluoride among Saudi dental practitioners in Riyadh public hospitals was assessed. The response was average, with means of 3.1 and 3.3 for knowledge and attitude, respectively, among the participants.

Keywords: silver diamine fluoride, dental caries, public hospitals, knowledge, attitude, SDF approval and future usage

Chlorhexidine-modified Nanotubes and Their Effects on the Polymerization and Bonding Performance of a Dental Adhesive

Sara Kalagi, Sabrina A. Feitosa, Eliseu A. Münchow, Victor M. Martins, Ashley E. Karczewski, N. Blaine Cook, Kim Diefenderfer, George J. Eckert, Saulo Geraldeli, Marco C. Bottino.

Dental Materials, 2020 Mar;36: 687-697.

Objectives: The purpose of this study was to synthesize chlorhexidine (CHX)-encapsulated aluminosilicate clay nanotubes (Halloysite®, 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.

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 (α = 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-month 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.

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

Keywords: Nanotube, Halloysite, Aluminosilicate clay, Microtensile, Dentin, Adhesives, Bonding

Knowledge and Use of Caries Detection Methods among Dental Students and Dental Practitioners in Riyadh, Saudi Arabia

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International Journal of Dentistry, 2020 Dec; 8825890.

Aim: Accurate detection and diagnosis of dental caries is an integral part of achieving adequate comprehensive dental care. Furthermore, the high prevalence of caries and generally poor oral health in Saudi Arabia is a public health concern. In addition to necessary preventive programs and awareness initiatives, understanding diagnostic practices plays an important role in garnering broad background knowledge regarding the routine diagnostic means utilized by our targeted respondents. Therefore, this study aimed to assess the methods of caries detection among dental students and dental practitioners in Riyadh using a cross-sectional observational study design.

Methods: The sample comprised 496 dental students, interns, postgraduate residents, general dental practitioners, specialists, and consultants from the Riyadh region of Saudi Arabia. A survey was designed to assess caries detection methods, risk assessment practices, and knowledge of advanced diagnostic

methods. The responses were correlated with demographic and educational variables. Regression models were used to predict associations.

Results: 42.3% and 32.7% use sharp explorers in diagnosing caries always and most of the time, respectively. When conducting caries risk assessment practices, 64.4% was very likely to review the patient's medical history and lifestyle. In terms of knowledge of advanced diagnostic methods, 47.8% know "much" to "very much" about FOTI. The knowledge of advanced caries diagnostic methods and practices of advanced diagnostic methods were significantly positively correlated ($r = 0.388$, $P < 0.001$). Linear regression analysis indicated that higher experience (10+ years) was associated with higher knowledge regarding advanced caries diagnostic methods ($\beta = 0.27$, $P = 0.009$). The mean rank for risk assessment practices was significantly lower in GPs compared to consultants ($P < 0.05$).

Conclusions. The use of traditional and invasive methods of caries detection is prevalent among our respondents, while the usage of advanced diagnostic methods is for the most part low. Therefore, we advocate for more minimally invasive approaches and as such encourage the practice and availability of advanced diagnostic methods.

Evaluation of microleakage in class-II bulk-fill composite restorations

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Journal of Dental Sciences, 2020 Dec;15(4):486-492.

Background/purpose: Despite the clinical appeal of restoring deep class II cavities in single increment using bulk-fill resin composite, sealing of bulk-filled composite restorations is a concern. This study evaluated interfacial adaptation of bulk-fill composite restoration to axial wall and gingival floor of class II cavities using cross-polarization optical coherence tomography (CP-OCT).

Materials and methods: Box-shaped class II cavities were prepared in extracted molars and divided into three groups ($n = 7$) according to adhesive used; Clearfil SE Bond 2 (SE2), Tetric-N Bond Self-Etch (TSE) or Tetric-N Bond Universal (TNU). All adhesives were applied in self-etch mode and according to manufacturers' recommendation. Then, preparations were bulk-filled with Filtek Bulk Fill Posterior Restorative resin composite and immersed in a contrast agent. Tomographic images of axial wall and gingival floor of each restoration were obtained by CP-OCT (IVS-300, Santec) with a central wavelength of 1330 nm and were imported to an image analysis software to quantify microleakage.

Results: Mann–Whitney U test showed statistically significant difference in microleakage percentage between the groups at both axial wall and gingival floor ($p < 0.05$). SE2 group had the lowest percentage of microleakage ($p < 0.05$), as only few cross-sections showed areas of reflections from contrast agent penetrating into axial wall (8.23 ± 6.8) and gingival floor (7.07 ± 4.1), followed by TNU group (18.13 ± 12.9 axially and 30.61 ± 11.9 gingivally). Microleakage was frequently observed at the axial wall and gingival floor of TSE group, showing the highest percentages of 25.50 ± 12.5 and 36.97 ± 10.2, respectively ($p < 0.05$).

Conclusion: All tested groups exhibited different extent of interfacial microleakage, however, two-step self-etch adhesive yielded superior adaptation in comparison to one-step self-etch adhesive and universal adhesive.

Keywords: Adhesive, Bulk-filled, Composite-resins, Microleakage, Optical coherence tomography

Epidemiology of Traumatic Dental Injuries Among Adults in an Indian Sub-Population

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Researchsquare. Online published 2 Aug 2019, ahead to print.

Background: The etiology, presentation and management of traumatic dental injuries (TDI's) varies significantly between the adult and the younger population. Most epidemiological studies on TDI's have focused on the pediatric age group. This study aims to report and compare the distributions of TDI's among adults in a sub-population in India.

Methods: This prospective observational study was performed on 1562 consecutively selected patients (1218 Males and 344 females) from a University dental hospital in India, between July 2014 to June 2018. The clinical examinations were performed by a single trained and calibrated Endodontist. Only TDI's to anterior teeth were recorded (canine to canine in the maxilla and mandible) and classified using a modified version of the WHO's classification. Intraoral periapical and panoramic radiographs were also taken for all the subjects.

Result: A total of 1562 patients aged between 20 and 73 years, with a mean age of 36 years were examined during the study period. The total number of teeth with TDI's were 3044. Males (78%) clearly outnumbered the females (22%) in all the age groups. The most common type of injury occurring in both the genders is uncomplicated crown fracture. Avulsion injuries are more likely to be seen by a dentist within 1hour post-trauma. About two third of the TDI's were caused by road traffic accidents (RTA) followed by falls in about 20% of the patients.

Conclusion: Uncomplicated crown fracture was the most commonly observed type of TDI and RTA's were the primary cause of TDI.

Keywords: Adults; dental injuries; prevalence; trauma.

Evaluation of the adaptation of dental polymers using cross-polarization optical coherence tomography

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Biomedical Physics & Engineering Express, 2019 Jan; 5:025014 (1-9).

Objective*:* The purpose of this study was to image gap formation and micro-leakage in restored cervical cavities with three different dental adhesives using cross-polarization optical coherence tomography (CP-OCT).

Methodology*:* Thirty saucer shape class-V cavities were prepared on the buccal and lingual surfaces of extracted human molars. Samples were randomly divided into three groups (n = 10) according to the used adhesive; all-in-one Tetric N-Bond self-etch (TN; Ivoclar/Vivadent, Liechtenstein), G-Premio universal (GP; GC, Japan) in self-etch mode and two-step self-etch Clearfil SE Bond 2 (SE; Kuraray Noritake, Japan). All cavities were bonded and filled with a universal composite (Estelite ∑ Quick, Tokuyama Dental, Japan) and cured by the LED light curing unit. Then, tomographic images were taken under CP-OCT to detect gap formation at the cavity in order to calculate the gap percentage in each group.

Result*:* Mann-Whitney U test showed statistical significant difference among all groups ($p < 0.05$) with high gap percentage in GP group followed by TN group. SE group showed the highest composite adaptation with the lowest gap percentage.

Conclusion*:* Within the limitation of the study, the restored cavities with two-step self-etch adhesive exhibited fewer microgaps and micro-leakage than one-step self-etch adhesives.

Keywords: imaging, OCT, tooth, gap, polymer, optical, adhesive

Impact of surface micromorphology and demineralization severity on enamel loss measurements by cross-polarization optical coherence tomography

Maryam A. Alghilan, Frank Lippert, Jeffery A. Platt, George J. Eckert, Carlos González-Cabezas, Daniel Fried, Anderson T. Hara

Journal of Dentistry, 2019 Feb; 81:52-58.

Objectives: Optical Coherence tomography (OCT) is a promising clinical imaging technology for quantitative and objective assessment of dental erosion. We aimed to determine the influence of enamel surface roughness and demineralization severity (by erosive challenge) on dental surface loss measurements by cross-polarization OCT (CP-OCT).

Materials and methods: Human enamel specimens were prepared with three surface roughness levels (very rough, rough and polished; n = 10 each). They were evaluated using CP-OCT and optical profilometry (gold standard) at baseline, and after 1, 2, 4, 6, 8, 16 and 24 h of erosion demineralization. The effects of roughness and demineralization on enamel loss were analyzed using ANOVA (alpha = 0.05). Intraclass correlation coefficients (ICCs) and Bland-Altman plots were used to evaluate inter-method agreement and intra-examiner repeatability.

Results: CP-OCT surface loss measurements did not significantly differ with the changes in enamel surface roughness ($p = 0.27$). Among demineralization severities, CP-OCT surface loss measurements at 1, 2, 4 and 8 h did not differ among each other, but they showed significantly lower enamel loss than 16 and 24 h; 6 and 16 h were significantly lower than 24 h ($p < 0.05$). Overall, CP-OCT and optical profilometry measurements did not differ ($p = 0.73$); however, ICC was relatively low (ICC = 0.34). Enamel loss estimation by CP-OCT presented an error of approximately ± 150 μm compared to profilometry. Intra-examiner repeatability with CP-OCT was excellent (ICC = 0.98).

Conclusions: Enamel roughness did not affect CP-OCT measurements. The estimated error of CP-OCT measurements limited the appropriate assessment of enamel erosion surface loss, in the magnitude simulated in this study.

Clinical relevance: Enamel thickness measurement by CP-OCT presents potential as an objective method for monitoring dental erosion lesions; however, its use may be limited for the assessment of the initial stages of enamel surface loss by erosion.

Keywords: Demineralization; Dental erosion; Enamel; Optical coherence tomography; Surface roughness; Tooth wear.

Adaptation Assessment of Three Bonded Resin Restorations at the Cavity Floor Using Cross-Polarization Optical Coherence Tomography.

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Photobiomodulation, Photomedicine, and Laser Surgery, 2019 May;37(5):318-824.

Objective: The aim of the study was to compare the composite adaptation of three systems by using cross-polarization optical coherence tomography (CP-OCT).

Background data: Most polymer-based restorations suffer from polymerization shrinkage that affects the interfacial seal. This shrinkage cannot be detected by conventional X-ray methods. Optical coherence tomography was proved to be a reliable non-invasive imaging tool to examine biological structures and biomaterials at micron scale.

Methods: Twenty-four cylindrical class-V cavities were prepared on the buccal surfaces of the extracted human molars. After cavity preparation, samples were randomly divided into three groups (n = 8) according to the restoration system: one-step self-etch Clearfil Tri-S Bond Plus with Clearfil Majesty ES-2 composite (TS; Kuraray Noritake Dental), Single Bond Universal in self-etch mode with Filtek Z350 XT composite (SB; 3M ESPE), and one-step self-etch Plafique Bond with Plafique LX 5 composite (PB; Tokuyama Dental). The restoration placement was carried out according to the manufacturers' recommendations. Later, the specimens were immersed in a contrasting agent; then, image acquisitions were taken by CP-OCT to calculate the adaptation percentage by using an image analysis software.

Results: Mann-Whitney U test showed no statistical significant difference in the adaptation percentage between TS (91.72 ± 11.6) and SB (93.43 ± 6.9) groups ($p > 0.05$). However, the adaptation percentage in PB (41.83 ± 28.5) was significantly lower than in the other tested groups ($p < 0.05$).

Conclusions: Within the limitation of the study, TS and SB groups showed better adaptation than PB. Moreover, CP-OCT is a useful imaging tool that can display composite adaptation at micron scale.

Keywords: OCT; composite; dentin; gap; laser; tooth.

Bulk-fill composite marginal adaptation evaluated by cross-polarization optical coherence tomography

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Cogent Engineering, 2019 Jul; 6(1):1643976.

Objective: This study evaluated interfacial gap formation in bulk-fill composite restorations using cross-polarization optical coherence tomography (CP-OCT).

Materials and methods: Two bulk-fill resin composite materials each with its specific adhesive were used; light-cured Filtek Bulk Fill Posterior Restorative with Scotchbond Universal (3M ESPE) “group A” and dual-cure bulk-fill composite BulkEZ with Prelude One (Danville Materials) “group B.” Proximal cavities (2 × 2 × 4.5 mm; width × length × depth) prepared on extracted human molars (n = 5) were restored with adhesives applied in self-etch mode and the composite placed in bulk. After 24 h storage, the specimens were immersed in ammoniacal silver nitrate solution for 24 h followed by a photo-developing solution for 8 h. Later, CP-OCT (Santec, Japan) at 1310 nm center wavelength was used to scan each specimen. Interfacial gap at the gingival floor was analyzed on cross-sectional OCT images obtained from each specimen at 0.5 mm interval using ImageJ analysis software.

Result: Mann–Whitney test showed a significant difference ($p < 0.05$) between the groups with group A showing higher percentage of gap formation at the gingival floor.

Conclusion: Within the limitation of the study, a better sealing of gingival margin was achieved with the dual-cure bulk-fill dental composite compared to the light-cured composite.

Keywords: resin composites bulk-fill adaptation; marginal gap imaging; optical coherence tomography

Perception of general dentists and laypersons towards altered smile aesthetics

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Journal of Orthodontic Science, 2019 Aug;8:14.

Objectives: This study aimed to evaluate how dental practitioners and laypersons differ in their perception of altered smile aesthetics based on viewing images of a digitally manipulated smile.

Materials and methods: A photograph with close to ideal smile characteristics was selected and digitally manipulated to create changes in buccal corridor space (BCS), midline diastema, gingival display, and midline shift. These altered images were rated by two groups: dental practitioners and lay persons using a visual analogue scale. The mean ± standard deviation (SD) of both groups were calculated and the Student's *t*-test was used to identify any statistically significant differences between the groups. Data analysis was done using the Statistical Package for Social Science (version 23.0; SPSS Inc., Chicago, Illinois, USA).

Results: The dentists were more sensitive to changes in the midline shift than laypeople and provided lower scores. There were no significant differences between the two groups when the gingival display alteration was ≤3 mm. However, for gingival display of 4 mm and 5 mm, there was significant difference between the two groups, with dentist rating them poorer as compared with the laypeople ($P < 0.001$). Dentists were more sensitive than the laypeople for midline diastema of 2 mm and 3 mm ($P < 0.001$ and $P = 0.005$ respectively). Changes in the BCS had minimal impact on the overall esthetic score for both the groups.

Conclusions: Perception of smile esthetics differed between dentists and laypersons.

Keywords: Dentist perception; lay people; smile esthetics; visual analog scale.

Non-vital Endo Treated Tooth Bleaching with Sodium Perborate

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Current Health Sciences Journal, 2019 Jul-Sep; 45(3):329-332.

Abstract: Recently a visually pleasing smile has become a major concern for the patients; therefore, dental bleaching has gained importance due to its safety and great aesthetic results. The aim of this paper is to report a case of a non-vital, discolored, maxillary central incisor bleached by Sodium Perborate with the use of glass ionomer cement as a mechanical barrier. The patient was a 35-year-old female complaining of a discolored and unaesthetic appearance of her upper front tooth. After endodontic retreatment, the bleaching treatment was applied to the maxillary left central incisor. Following the treatment, a satisfactory aesthetic result was achieved.

Keywords: bleaching, discoloration, walking bleaching method, non-vital bleaching, endo bleach, mechanical barrier

In vitro longitudinal evaluation of enamel wear by cross-polarization optical coherence tomography

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Dental Materials, 2019 Oct;35(10): 1464-1470.

Objectives: Enamel thickness determination by Cross-Polarization Optical Coherence Tomography (CP-OCT) is a promising approach for quantitative monitoring of tooth wear progression. This study evaluated the ability of CP-OCT to quantify the thickness of natural enamel before, during and after tooth wear simulation.

Materials and methods: Natural, unpolished human dental enamel slabs were submitted to five wear stages (Wear 1: to level the surfaces; Wear 2 to Wear 5: 0.05±0.02mm reduction each) simulated by an automatic grinding/polishing machine. Enamel thickness was evaluated with CP-OCT and a gold-standard method (micro-CT) at baseline and after every wear stage. Data were analyzed using ANOVA with pairwise comparisons for wear stages' impact on the thickness and wear depth measurements. The inter-method agreement was analyzed using intra-class correlation coefficients, the difference between means, and Bland-Altman plots.

Results: Enamel thickness measurements (mean±standard error, in mm) with natural (1.40±0.05) and worn surfaces (1.08±0.02) by CP-OCT did not differ significantly from those measured by micro-CT (natural=1.39±0.05; worn=1.09±0.02; p-values=0.30 and 0.39, respectively). CP-OCT and micro-CT showed excellent agreement on natural (ICC=0.98) and worn surfaces (ICC=0.98) enamel thickness measurements. Among and between wear stages, there were significant differences in enamel thickness and wear depth measurements for both methods (p-value <0.0001 for all). Both methods yielded similar measurements' mean (0.14±0.01; p-value=0.87) and were in good agreement (ICC=0.77) for wear depth estimation.

Significance: CP-OCT allows accurate measurement of enamel thickness on natural tooth surfaces. Enamel thickness measurement by CP-OCT allows quantitative monitoring of enamel thickness changes and wear depth following progressive wear.

Keywords: Dental enamel; Enamel thickness; Optical coherence tomography; Tooth wear; X-Ray Micro-CT.

Cross-polarization OCT Assessment of Dentin Interface with Combinations of Adhesives and Composites

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EC Dental Science, 2019 May; 18(6):1157-1170.

Abstract: The current study aimed to compare the adaptation of two resin composite materials in restoring class-I cavities with two selfetch adhesive systems using cross-polarization optical coherence tomography (CP-OCT). Cylindrical class-I cavities were prepared on forty extracted human premolars. Two self-etch adhesives; Clearfil SE bond 2 (SE; Kuraray Noritake Dental, Japan) and Bond Force (Palfique Bond) adhesive (PL; Tokuyama Dental, Japan) were used in combination with two composites materials; Herculite XRV microhybrid dental composite (HRV; Kerr, Italy) and Estelite Alpha composite (ESA; Tokuyama Dental, Japan). The specimens were divided into four groups (n = 10); SE-HRV, SE-ESA, PL-HRV and PL-ESA. All specimens were submerged in a contrasting medium. After that, all groups were optically imaged under CP-OCT at every 250 μm interval distance. Then, image binarization and gap quantification were carried out using ImageJ analysis software. There was a statistically significant difference between all the groups except between SE-ESA and PL-ESA ($p > 0.05$). The highest median gap percentage was seen in PL-HRV group (56.15%) followed by SE-ESA (1.62%), PL-ESA (0%) and SE-

HRV (0%), respectively. Other than composite filler loading and adhesive formula, the interactions of the adhesive and composite co-polymers might have a great influence on composite adaptation.

Keywords: Adhesive; Dentin; Composite; Adaptation; Tooth; Optical Coherence Tomography; Gap

Prevalence and Risk Indicators of Dentine Hypersensitivity among Adults Living in Riyadh City, Saudi Arabia

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International Journal of Medical Research & Health Sciences, 2019 Oct;8(10): 8-13.

Objectives: To explore the prevalence of dentine hypersensitivity and associated risk indicators among Saudi adults in Riyadh.

Methods: A cross-sectional study was designed to assess the presence of dentine hypersensitivity in 547 adults who attended the College of Dentistry's clinics. The assessment tools were questionnaires and clinical dental examinations. Questionnaires included sections of sociodemographic, behavioral, dietary and medical condition variables. Dentine hypersensitivity was examined by passing dental explorers on all teeth surfaces in addition to the application of a blast of cold air from three-in-one syringe. Statistical analyses included descriptive statistics, t-tests, One-Way Analysis of variance and correlation coefficient tests.

Results: Dentine hypersensitivity was observed in 759 teeth among 182 participants yielding tooth prevalence and person's prevalence of 4.8% and 33.27% respectively. The mean number of teeth with dentine hypersensitivity was 1.39 teeth per person. Dentine hypersensitivity was not significantly related to gender, marital status, or occupation. Also, dentine hypersensitivity was not related to smoking, brushing, flossing, and sewak uses. Drinking soda and coffee, and eating citrus fruits, pickles and seeds were not significantly correlated to dentine hypersensitivity. No associations of dentine hypersensitivity with diabetes, anorexia or Bulimia Nervosa were found. The mean number of teeth with dentine hypersensitivity was higher among those who use of desensitizing toothpaste and those with GERD.

Conclusion: Dentine hypersensitivity was present in 4.8 teeth and in 33.3 persons. No significant associations between demographic, behavioral, and medical conditions variable were observed with dentine hypersensitivity except for desensitizing agents users and those suffering GERD condition.

Keywords: Prevalence, Risk, Indicator, Dentine, Hypersensitivity

Indices for Dental Fluorosis – An Overview and Critique. (Book)

Sachin Naik, ***Sanjeev B. Khanagar*****,** Suneel V. Vadavadagi.

Lambert Academic Publishing; Mauritius, 2019, 87p. (ISBN: 978-620-2-02736-6)

Summary: Fluoride is the most important caries-preventive agent in dentistry, the effects of fluoride on enamel formation causing dental fluorosis in man are cumulative, rather than requiring a specific threshold dose, depending on the total fluoride intake from all sources and the duration of fluoride exposure. Dental fluorosis is a chronic, fluoride-induced condition, in which enamel developed is disrupted and the enamel becomes hypomineralized. Fluorosis is continuing to be an endemic problem. More and more areas are being discovered regularly that are affected by fluorosis in different parts of the world. Following the introduction of the first fluorosis index by Dean, a series of fluorosis indexes were introduced. It is important to appreciate the reasoning behind the development of certain indices. Studies have investigated the public's perceptions of the different levels of severity of fluorosis. This book provides a list of the different

Indices used to assess the dental fluorosis and comparison of the indices used to describe the clinical appearance of dental fluorosis.

Ex vivo fracture resistance of teeth restored with glass and fiber reinforced composite resin

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Journal of the Mechanical Behavior of Biomedical Materials, 2018 Jun;82:235-238.

Objectives: This study aims to compare the *ex vivo* fracture resistance of root canal treated (RCT) teeth restored with four different types of fibers under composite resin.

Subjects and methods: One hundred and forty extracted mandibular first molar teeth were assigned to seven groups (n = 20/group). Group 1 was the control group. In groups 2−7, endodontic access and standard Mesio-occluso-distal (MOD) cavities were prepared. Following RCT, group 2 was left unrestored. In group 3, flowable composite resin (FCR) was used to line the cavities and restored with composite resin. In groups 4,5,6 and 7, Ribbond, Everstick, Dentapreg and Bioctris fibers were inserted in flowable resin and restored respectively.

Results: All the groups restored with fiber reinforced composite displayed higher fracture resistance than the group restored with only composite resin ($p < 0.001$). In addition, Groups restored with Everstick and Bioctris (Groups 5 and 7) showed higher fracture resistance when compared to Ribbond and Dentapreg (Groups 4 and 6).

Conclusion: E glass fibers demonstrated highest fracture resistance and hence can be preferred over other fiber types to reinforce RCT teeth with weakened crown structures.

Keywords: Composite resin, Fiber reinforced, Fracture resistance

The Influence of Hardness and Chemical Composition on Enamel Demineralization and Subsequent Remineralization

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Journal of Dentistry, 2018 Aug;75:34-40.

Objectives: The objectives were to investigate the hardness and chemical composition of sound, demineralized and pH-cycled bovine enamel and determine their influence on demineralization and remineralization behavior.

Methods: Ninety-four, 5 × 5 × 2-mm bovine enamel specimens were demineralized using three different times [(24 h (n = 33), 48 h (n = 30), 96 h (n = 31)]. The specimens were then pH-cycled using either 367 ppm F sodium fluoride or deionized water. Knoop hardness (HK) and energy-dispersive X-ray spectroscopy (measured elements: Ca, P, F, C, Mg, N) were performed at three stages (sound, after demineralization, after pH-cycling) and transverse microradiography was performed after demineralization and pH-cycling. Comparisons were determined by ANOVA.

Results: Results showed that HK, integrated mineral loss and lesion depth were significantly different between stages, demineralization times and treatments. The weight% of F at the surface was significantly affected by treatment, irrespective of demineralization time, while the Ca:P ratio of the enamel remained stable even after de- and remineralization protocols. The F in fluoride groups and the artificial saliva in

non-fluoride groups were both able to induce enamel remineralization, indicating the protective effect of salivary pellicle against demineralization even in the absence of fluoride.

Conclusions: Harder specimens and those with greater surface F weight% were less susceptible to demineralization and were more likely to remineralize. However, the amount of surface Ca and P did not influence de- or remineralization behavior.

Clinical Significance: This in vitro study can help clinicians better understand the caries process and the impact of the physical and chemical characteristics of enamel on its behavior during de- and remineralization. The over-the-counter fluoride toothpaste containing 1100 ppm-F was used, and was able to produce a mineralized enamel surface layer.

Keywords: Enamel, Bovine, Hardness, Chemical, Mineral, Composition

Optical Evaluation of Enamel Microleakage with One-Step Self-Etch Adhesives

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Photomedicine and Laser Surgery, 2018 Nov; 36(11): 589-594.

Objective: In this in vitro study, cross-polarization optical coherence tomography (CP-OCT) was used to evaluate microleakage in dental composite restorations bonded to enamel with two types of one-step self-etching (SE) adhesives.

Background data: One-step SE adhesives were proposed to simplify bonding of composite restorations. However, bonding of these simplified adhesive to dental enamel is still questionable. OCT is a promising diagnostic tool that allows micron-scale imaging of biological tissues and structures.

Methods: Class-V cavities (4-mm diameter × 1-mm depth) were prepared on the labial surfaces of extracted human anterior teeth with margins and floor located in enamel. The cavities were then divided into two groups (n = 5) and restored with either Tetric N-Bond Universal (Ivoclar Vivadent, Liechtenstein) or Palfique Bond (Tokuyama Dental Corporation, Japan), followed by Estelite Flow Quick flowable composite (Tokuyama Dental Corporation). After storage in 100% humidity for 24 h, specimens were immersed in ammoniacal silver nitrate solution for another 24 h. Later, they were rinsed and immersed in photo-developing solution under fluorescent light for 8 h. CP-OCT at 1310 nm center wavelength was used to scan seven two-dimensional cross-sectional images from each specimen. Each cross-sectional image was analyzed using ImageJ software to quantify interfacial microleakage at the cavity floor.

Results: Student's t-test showed significant difference between the tested adhesives ($p < 0.05$). Palfique Bond adhesive presented inferior interfacial adaptation as it obtained higher values of floor microleakage compared to Tetric N-Bond Universal adhesive group.

Conclusions: CP-OCT enabled nondestructive quantitative assessment of microleakage in enamel dental restorations.

Keywords: enamel microleakage; imaging; one-step adhesives; optical coherence tomography; resin composite; self-etch adhesives.

Interfacial Gap Assessment of Two Dental Adhesives and Polymer-Based Resin Composites Using Cross-Polarization Optical Coherence Tomography

Turki A. Bakhsh, Halah M. Alturkstani, Razan N. Alharbi, Hind J. Alrefai, Tahani O Badeeb, Nour H. Altouki, ***Ahmed O. Jamleh***

Preprints, 2018; 2018090334.

Objectives: The current study aimed to compare the adaptation of the restored class-I cavities with two self-etch adhesives bonded to two resin composite using cross-polarization optical coherence tomography (CP-OCT).

Materials and Methods: Cylindrical class-I cavities were prepared on twenty, extracted human premolars. Two self-etch adhesives; Clearfil SE bond 2 (SE; Kuraray Noritake Dental, Japan) and Bond Force (Palfique Bond) adhesive (PL; Tokuyama Dental, Japan) were used in this study that were bonded to either resin composites materials; Herculite XRV microhybrid dental composite (HRV; Kerr, Italy) or Estelite Alpha composite (ESA; Tokuyama Dental, Japan). The specimens were divided into four groups (n=5); SE-HRV, SE-ESA, PL-HRV and PL-ESA. All specimens were varnished and stored in distilled water for 24h. Then, they were submerged in a contrasting medium. After that, all groups were optically imaged under CP-OCT at every 250 µm interval distance. Later, image binarization and gap quantification were carried out using Image analysis software.

Result: There was a significant difference between all the groups except between SE-ESA and PL-ESA ($p = 0.51$). The highest median gap % was seen in PL-HRV group followed by SE-ESA, PL-ESA and SE-HRV.

Conclusion: Other than composite filler loading and adhesive formula, the interactions of the adhesive and composite copolymers have great influence on composite adaptation.

Keywords: dhesive, Dentin, Composite, Adaptation, Tooth, Optical coherence tomography, Gap

Time sensitivity associated with the application of water-based all-in-one adhesive system

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Cogent Engineering, 2018 May;5(1):1472052.

Abstract: This *in vitro* study was performed to investigate effect of delayed composite application on dentin bonding durability of water-based all-in-one self-etch adhesive system using micro-tensile bond strength (MTBS) testing. Fifteen freshly extracted, non-carious premolar teeth were randomly selected. After removing the roots, the teeth were occlusally trimmed to expose superficial dentin. Then, the exposed occlusal dentin was bonded with a self-etching adhesive (Tetric-N Bond self-etch; Ivoclar/Vivdent) according to the manufacturer's instructions. After that, the samples were divided equally into 3 groups based on the time of application of Tetric-N Ceram composite resin (Ivoclar/Vivdent, Liechtenstein). In group 1, the composite build-up was carried out immediately after curing the adhesive, and polymerized according to the manufacturer instructions. In groups 2 and 3, the samples were restored after 1 and 5 min following adhesive curing, respectively. After 24 h storage, each bonded sample was sectioned into beams (0.7 mm × 0.7 mm) for MTBS testing. Results of the MTBS were analysed and tested using one-way ANOVA and post hoc Tukey test at significance level of 5%. The results showed that applying composite restoration immediately after adhesive curing gave strength of 11 ± 6 MPa. Composite application after curing the adhesive by 1 and 5 min showed 16 ± 8 MPa and 11 ± 5 MPa, respectively. The 1 min delayed

application group had significantly higher bond strength than the other tested groups ($p > 0.05$). In conclusion, delaying the composite application after polymerization of water-based all-in-one adhesive for 1 min showed better bond strength.

Keywords: Biomaterials; Biomechanics; Biomaterials and Medical Devices; Composites; Dentistry

Comparative SEM Observation of Silver-Nitrate at Resin-Dentin Interface: Nanoleakage Study

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Oral Health Care, 2017 Jun; 2(2):1-5.

Background: Most of one-bottle self-etch dental adhesives or so-called “all-in-one” system contains a mixture of hydrophilic and hydrophobic components that are dissolved in an organic solvent. This variability between the adhesives would affect their interaction with tooth structures. Flaw in this interaction, represented by poor dentin hybridization might affect the treatment success. Thus, the objective of the study was to compare between two different all-in-one self-etch adhesives, by examining the nanoleakage expression at the dentin-resin interface.

Methodology: Two all-in-one self-etch adhesives; water-based Tetric-N bond adhesive (TN; Ivoclar/Vivadent) and ethanol/water-based Tri-S bond plus (TS; Kuraray Noritake) adhesive, were used for bonding resin composite to human dentin. In order to prepare the specimen for nanoleakage evaluation, all specimens were sectioned, coated with nail-varnish and subjected to ammoniacal silver nitrate solution followed by developing solution. Then, images were taken under scanning electron microscope (SEM) and investigated by energy-dispersive X-ray spectroscopy (EDS) to trace the silver grains at the dentin-resin interface.

Result: Unlike in TS group that did not show silver deposition throughout the bonded area, the TN group showed heavy silver deposition along the hybrid layer as well as throughout the adhesive layer using SEM/EDS.

Conclusion: It can be concluded that water-based all-in-one adhesive would adversely affect the longevity of polymeric dental restoration as it showed heavy silver deposition along the dentin-resin interface.

Keywords: adhesive, functional monomers, water-based adhesive, SEM, nanoleakage

High Proportions of Staphylococcus Epidermidis in Dental Caries Harbor Multiple Classes of Antibiotics Resistance, Significantly increase Inflammatory Interleukins in Dental Pulps

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Microbial Pathogenesis, 2017 Aug;109:29-34.

Abstract: *Staphylococcus epidermidis* is one of most prevalent in dental caries or dental pulp which has the capability of horizontal genetic transfer between different bacterial species in the oropharynx, suggesting that it may evolve with the dissemination of resistant determinants. This study was performed to molecularly characterize and differentiate *S. epidermidis* isolated from dental caries and healthy individual. Also, two important cytokines in inflammation were assayed caused due to S. *epidermidis* of

health and dental caries sources. Dental caries strains were more resistant with high MIC_{50} and MIC_{90} value. These isolates also showed the presence of *mecA* gene and another virulence gene i. e *sea* and *seb* comparatively more than healthy individual isolates. SCCmec types, III and IV was more prevalent in dental caries isolates where an as healthy individual was more non-typable. Additionally, the quantity of IL-1β and IL-8 caused due to dental caries isolates was seen more which indicate dental caries isolates are able to induce. This study showed that *S. epidermidis* a normal flora of oropharyngeal are more diverse to those strains which cause dental caries. *S. epidermidis* owns a prodigious genetic plasticity that permits to obtain, lose or regulate genetic elements that provide compensations to improve its colonization in the host.

Keywords: *S. epidermidis,* Dental caries, Resistant determinants, Interleukins, SCCmec types

Incidence and Pattern of Dental Erosion in Gastroesophageal Reflux Disease Patients

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Journal of Pharmacy & Bioallied Sciences, 2017 Nov;9(Suppl 1):S138-S141.

Aim: Gastroesophageal reflux disease (GERD) is a very common condition whose consequences of are localized not only in the esophagus; extra-esophageal involvement has frequently been reported. The aim of the study is to examine the incidence and pattern of dental erosion in GERD patients.

Methodology: A total of 50 patients were recruited in this study (control -25 and GERD -25). All participants diagnosed having GERD by the endoscopic examination by their gastroenterologist are included. The patients were examined for dental erosion and will be quantified using Basic erosive wear examination index.

Results: The results showed that the incidence of dental erosion was 88% as compared to 32% in the control group which was found to be statistically significant.

Keywords: Gastroesophageal disease, dental erosion, erosive index

Evaluation of Vickers Hardness of Bulk-fill Composites Cured by Different Light Sources

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Proceeding of SPIE, 2016 Feb; 9692: 96920J-1.

Objective: The current in vitro study was performed to evaluate Vickers hardness (VHN) of two different composite resins that were cured by using two different light curing units.

Materials and Methods: Porcelain tube samplers were used to fabricate composite cylinders from either Tetric Evoceram BulkFill (BF; Ivoclar/Vivadent, USA) or SonicFill composite (SF; Kerr, USA). Each composite type had 12 cylindrical specimens, and each specimen was cured with either Blue-phase N light-cure (Bp; Polywave, Ivoclar/Vivadent, USA) or Elipar S10 (El; Monowave, 3M ESPE, Germany). The VHN data were analyzed and tested by using Mann-Whitney U test at a significance level of 5%.

Results: Statistical analyses demonstrated an interaction between the type of composite and the type of light curing source. Significant differences ($P<0.05$) were recorded for all groups with higher VHN hardness of SF-El and lowest for BF-El.

Conclusions: It can be concluded that the surface hardness of bulk-fill composite is not dependent on the type of light-cure. This research was supported by King Abdulaziz University.

Dental Aesthetics and Attitudes among University Students in Saudi Arabia-A Cross-Sectional Study

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Journal of Dentistry and Oral Disorders, 2016 Jun;2(4):1022, 1-4.

Objective: The objectives of this research were to investigate the level of satisfaction, knowledge, attitudes, problems and needs related to dental aesthetic among students of King Saud bin Abdulaziz University for Health Sciences.

Methods: We used cross-sectional study design. Self-administered questionnaire were distributed among males and females dental students of first year pre professionals. The effect of parents' occupations, geographical regions, gender and type of schooling on the level of knowledge, attitudes, problems and needs related to dental aesthetics were also determined.

Results: A total of 294 students participated in the study. We found 45% of the students heard about dental aesthetics from their families and friends. Out of the total 74% subjects with non-working mother had more negative attitudes toward dental aesthetics. The most common problem reported was having protruded teeth (69%). The most common treatment need of the subjects was teeth whitening (82%) and of total 72% subjects with non-working mother had more need for treatments.

Conclusion: The majority of students showed a high level of knowledge regarding dental aesthetics. On the other hand, a low level of positive attitudes regarding dental aesthetics was observed. Awareness program may be launched for parents and young students for promoting positive attitudes towards aesthetics needs, and dental screenings may be planned so that different aesthetic requirements and needs of students may be assessed as early interventions result in better oral and dental aesthetics.

Keywords: Dental aesthetics; Beauty; Dental cosmetic; Dental attitude; Dental knowledge; Dental problems; Socio-Demographic factors

Success and Survival Rates of Teeth Restored with Cast Post and Core among National Guard Health Affairs Patients, Riyadh, Saudi Arabia

Abeer Al Subait, Abdullah Albawardi, Abdulaziz Alghomlas, Mohanned Daabash, Mohammed Alotaibi, Yazeed Alturki

Advances in Dentistry & Oral Health, 2016 Jul;2(2):1-5.

Purpose: To determine the success and survival rates of endodontically treated teeth restored with cast post and core among NGHA patients in Riyadh, Saudi Arabia.

Materials and Methods: This retrospective study was conducted in King Abdulaziz Dental Centre (KADC) in Riyadh during November 2015 – April 2016. Fifty seven patients with 140 intraradicular cast posts were included. Patients were evaluated both clinically and radiographically according to the FDI criteria for the evaluation of direct and indirect restorations by two independent examiners, one examiner for the

radiographic and another for the clinical examination, after obtaining a well-written and explained informed consent form.

Results: Of 140 endodontically treated teeth restored with cast post and core, 65 (46.4%) teeth showed one or more of the radiographic failure and 76 (54.3%) showed one or more clinical sign of failure. The accumulative failure rate was 72.9 % which include relative failure of 45.0% and absolute failure of 27.9%. The majority of the radiographic failure involve; periapical lesion 30.7% and recurrent caries 24.3%. The majority of the clinical failure involve; dental caries 19.3% and periodontal pocket of more than 4mm 19.3%. The survival and success rate were 27.1% and 72.1% respectively.

Conclusion: Numerous complications and high failure rate were noted among endodontically treated teeth restored with cast post and core. This raise a question about the validity of selecting cast post and core to restore endodontically treated teeth in the presence of other advanced and recent alternative intraradicular retention systems. However, retrospective nature and small sample size caution us to conclude our findings. Further randomized clinical trials are needed with long term follow up period to build upon the findings of this study.

Keywords: Gingival recession; Core debonding; Post and core restorations; Incisors; Premolars

Shear Bond Strength between Fiber-Reinforced Composite and Veneering Resin Composites with Various Adhesive Resin Systems

Yousef A. AlJehani, ***Jagan K. Baskaradoss, Amrita Geevarghese, Marey A. AlShehry***, Pekka K. Vallittu

Journal of Prosthodontics, 2016 Jul;25(5):392-401.

Purpose: The aim of this research was to evaluate the shear bond strength of different laboratory resin composites bonded to a fiber-reinforced composite substrate with some intermediate adhesive resins.

Materials and methods: Mounted test specimens of a bidirectional continuous fiber-reinforced substrate (StickNet) were randomly assigned to three equal groups. Three types of commercially available veneering resin composites - BelleGlass®, Sinfony®, and GC Gradia® were bonded to these specimens using four different adhesive resins. Half the specimens per group were stored for 24 hours; the remaining were stored for 30 days. There were 10 specimens in the test group (n). The shear bond strengths were calculated and expressed in MPa. Data were analyzed statistically, and variations in bond strength within each group were additionally evaluated by calculating the Weibull modulus.

Results: Shear bond values of those composites are influenced by the different bonding resins and different indirect composites. There was a significant difference in the shear bond strengths using different types of adhesive resins ($p = 0.02$) and using different veneering composites ($p < 0.01$). Belle-Glass® had the highest mean shear bond strength when bonded to StickNet substrate using both Prime & Bond NT and OptiBond Solo Plus. Sinfony® composite resin exhibited the lowest shear bond strength values when used with the same adhesive resins. The adhesive mode of failure was higher than cohesive with all laboratory composite resins bonded to the StickNet substructure at both storage times. Water storage had a tendency to lower the bond strengths of all laboratory composites, although the statistical differences were not significant.

Conclusion: Within the limitations of this study, it was found that bonding of the veneering composite to bidirectional continuous fiber-reinforced substrate is influenced by the brand of the adhesive resin and veneering composite.

Keywords: Adhesive resins; prosthodontic resin composites; shear bond strength.

Susceptibility of Restorations and Adjacent Enamel/Dentine to Erosion under Different Salivary Flow Conditions

Maryam A. Alghilan, N. Blaine Cook, Jeffrey A. Platt, George J. Eckert, Anderson T. Hara

Journal of Dentistry, 2015 Dec;43(12):1476-1482.

Objectives: The aim of this study was to investigate the effect of erosion on direct tooth-coloured restorations and adjacent enamel/dentine under low and normal simulated salivary flow rates.

Methods: Bovine enamel and dentine specimens were prepared (n=16) and restored with the following materials: resin composite (FiltekZ250), resin-modified glass ionomer cement (Fuji II LC), high-viscosity glass ionomer cement (Fuji IX), and conventional glass ionomer cement (Fuji II). They were submitted to in vitro erosion-remineralisation cycling simulating normal (0.5 ml/min) and low (0.05 ml/min) salivary flow rates, for 5 days. The restorative material, enamel and dentine substrates were assessed with optical profilometry for surface loss. Mixed-model ANOVAs were used for statistical comparisons (alpha=0.05).

Results: Low-salivary flow significantly increased surface loss for all tested substrates ($p<0.05$), except FiltekZ250. Surface loss (mean±SD, in micrometres) under low-salivary flow was significantly higher in enamel (19.75±4.27) and dentine (23.08±3.48) adjacent to FiltekZ250 compared to Fuji II LC (16.33±2.30 and 20.47±2.58, respectively) and Fuji IX (15.79±2.41 and 20.63±2.34, respectively). Restoration surface degradation was significantly lower for Fuji II LC (2.17±0.73) than for both Fuji II (13.03±6.79), and Fuji IX (16.74±7.72) under low-salivary flow condition; whereas FiltekZ250 exhibited no meaningful surface loss (-0.35±0.19).

Conclusion: Limited to these in vitro conditions, low-salivary flow promoted higher erosive conditions for teeth and restorations. Some fluoride-containing restorative materials may reduce erosive wear on adjacent enamel and dentine. FiltekZ250 resisted erosive surface loss. Fuji II LC showed both reduced acid degradation and protection of adjacent dental surfaces to erosion.

Clinical significance: Patients at risk for erosion and in need of restorations may benefit from fluoride-containing restorative materials that resist erosive degradation. The data of this study suggest that resin-modified glass ionomer may be a suitable restoration for patients at higher risk of erosion with low exposure to fluoride.

Keywords: Composite resin; Glass ionomer cements; Hyposalivation; Teeth erosion; Xerostomia.

Current Trends in Aesthetic Dentistry.

Yousef A. AlJehani, Jagan K. Baskaradoss, ***Amrita Geevarghese, Marey A. AlShehry***

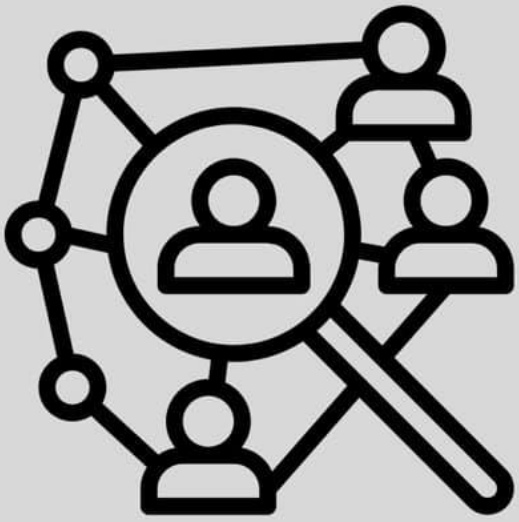
Health, 2014 Aug;6(15):1941-1949.

Abstract: The level of aesthetic requirement in clinical practice has increased over the past decade, and this has made it necessary for dentist to explore this field in order to satisfy the existing demand in this field. Technology can provide a solution to many of the routine hassles in dental practice. While optimal systems are far from fully realized, technology undeniably has made enormous progress. This review aims to provide an update on some of the recent advances in the field of aesthetic dentistry. MEDLINE (1990 to Jan 2014), PubMed (using medical subject headings), and Google Scholar searched using the following terms “Dental Composites”, “Ceramic Crowns”, “Aesthetic Posts”, “Ceramic Veneers”, and “Computer-Aided Design/Computer Aided Manufacturing (CAD/CAM)”. This was supplemented by hand-searching in peer-reviewed journals and cross-referenced with the articles accessed. Dentist and dental technician alike must be aware of the current technologies in their fields and be able to use it to their and their patient’s

advantage. The learning objective of this article is to review the advantages and disadvantages of recent esthetic materials and technology to aid in the proper utilization of the available treatment options with discretion.

Keywords: Ceramic Crowns, Aesthetic Posts, Ceramic Veneers, Computer-Aided Design/Computer Aided Manufacturing (CAD/CAM)

Social Sciences



2.12 SOCIAL SCIENCES

Bibliometric Evaluation of the Scopus Indexed Scholarly Literature of Ministry of National Guard – Health Affairs, Saudi Arabia

Ikram Ul Haq, Shafiq Ur Rehman, Hanan Al Kadri, Asif Iqbal.

Library Philosophy and Practice (e-journal), 2021; 5261.

Abstract: The research analysis output is one of the leading indicators to assess the quality of clinical care, education, and research in healthcare organizations. This study aims to evaluate the scholarly publication growth of the Saudi Arabian Ministry of National Guard – Health Affairs (MNG-HA), indexed in the Elsevier's Scopus database since 2002.

The study was performed using different bibliometric and visualization techniques. While the highest number of publications indicate King Saud bin Abdulaziz University for Health Sciences as an affiliated address, however, the publications from King Abdulaziz Medical City have the maximum citation impact. The 'Saudi Medical Journal' has been the most preferred journal at national level, while 'Studies in Health Technology and Informatics' from the Netherlands at the international level. Our results show that most collaborations are among the authors of the United States, Canada, and the United Kingdom at the international level. The growing numbers of publications, sound citation impact, and international collaboration reflect the practical approach of MNG-HA management's leadership, and aspiring contribution of MNG-HA researchers.

Keywords; Research productivity, scholarly literature, research output, citation impact, Visualization, Bibliometric Evaluation, Saudi Arabia, Ministry of National Guard – Health Affairs

Science & Technology Libraries: A Bibliometric Analysis from 1980 to 2020.

Ikram Ul Haq.

Science & Technology Libraries. Online published 20 May 2021, ahead to print.

Abstract: Science & Technology Libraries (S&TL) is the prestigious LIS journal, providing a platform for LIS practitioners serving in the libraries related to science and technology disciplines. S&TL has an adequate history of publications spread over four decades. The data for this retrospective study were obtained from the Scopus database. All kinds of documents, published between 1980 and 2020 were collected to evaluate the bibliometric indicators, such as periodic growth of publications, citations, average annual growth rate, authorship pattern, most productive authors, institutions, and countries. An explicit fluctuation rather decreasing trend in the number of documents was observed. The highest number of documents was published in the first decade (1980–1989), while the lowest number was found in the last decade (2011–2020). The documents published during the third decade (2000–2010) gained the maximum citation impact. The majority of documents consisted of articles and single-author pattern dominated; however, the review paper and multi-author publications received more citations. More than one-fifth of the publications were contributed by the United States, and the 18 topmost contributing institutions also belonged to the United States. The analysis of the flow of knowledge reveals that more than 60% of the citations are considered as the country's self-citation.

Keywords: Science and Technology Libraries, Bibliometrics, Library and Information Science

Radiologic Clinics of North America; Bibliometric Spectrum of Publications from 2000 to 2019

Ali Mohammed Aldhebaib, ***Ikram Ul Haq***, Fayaz Ul Haq, Muhammad Tanveer, Oinam Gokulchandra Singh

Library Philosophy and Practice (e-journal), 2021; 4783.

Aim: The aim of this study is to present the bibliometric analysis of papers published in *Radiologic Clinic of North America (RCNA)* from 2000 to 2019.

Design/Methodology: The Elsevier's Scopus database was used as a source to retrieve the bibliographic records published from 2000 to 2019. The data was evaluated on the following parameters, growth of publications and their citation impact by year, most contributing institutions and countries, productive authors, authorship patterns, most-cited papers, frequently used keywords and flow of knowledge. Only original and review articles were used for analysis, other types of documents were excluded. Microsoft Excel, SPSS and VOSviewer software were used for data analysis.

Results: A fluctuation was detected in the number of publications. A total of 1,401 papers were selected, of whom 1,241 (88.57%) were review articles and 160 (11.42%) were research articles. The mean and standard deviation (SD) scores of papers were 70 and 6.15 respectively. All selected papers received 34,145 citations with a mean score of 24.37 citations per paper (SD 1019.55). The study found that all top-10 contributing institutions belonged to the USA and the USA was also found most productive country. Out of the ten-most productive authors, nine were affiliated with USA and two-author pattern found a most preferred pattern.

Conclusion: The finding of this study exposed that the USA is the most productive country in terms of authors, institutions and even in citing the literature of *RCNA*.

Keywords; Radiology, Bibliometric; Research productivity, Scopus

COVID-19 Pandemic, Outbreak Educational Sector and Students Online Learning in Saudi Arabia

Muhammad Tanveer, Amiya Bhaumik, Shafiqul Hassan, ***Ikram Ul Haq***

Journal of Entrepreneurship Education, 2020 May;23(3):1-14.

Abstract: Measures to restrict the dissemination of the COVID-19 virus amongst the older and younger communities in many nations have led to the widespread closing of hospitals, schools, colleges and other educational establishments. According to the Saudi Ministry of Education, health authorities have been recommending "preventive and precautionary" steps to ensure full protection for students and staff. The ministry asked for the approval of virtual schools so that the learners will not mentally fall behind. The outbreak took a lot of hurdles like poverty, unemployment, social pressure and Education deficiencies.

After the announcement of University closures, Saudi Arabia is one of the nation where students are worried and going through a phase of learning, where they have no tutor, a lot of course work and only themselves to help them study. No team work, juts digital libraries are making it even worse. Many learning management systems are introducing, but none of them can come even closer to the impact and quality physical classrooms can provide. As graduate students, all students and professors are situated inside the liminal room of just being. This ensures they will contribute to both their students' and their own scholarly duties at the duration of the COVID-19 pandemic and campus suspensions. They've seen learning consortia and coalitions taking shape over the last few weeks, with numerous actors-including

states, retailers, educational experts, infrastructure companies, and mobile network operators-working forward to leverage new channels as a potential response to the problem.

Keywords: COVID-19, Pandemic, School and Universities Education, Pandemic, Saudi Arabia.

Research Productivity in the Health Sciences in Saudi Arabia: 2008-2017

Ikram Ul Haq, Shafiq Ur Rehman, Hanan M. Al-Kadri, Rai Khalid Farooq.

Annals of Saudi Medicine, 2020 Mar;40(2):147-154.

Abstract: The purpose of this study was to analyze the published research on health sciences carried out by researchers in Saudi Arabia in the last decade by assessing bibliometric output. Data for 2008 to 2017 was retrieved from Scopus. During this period, there was significant growth, from 1332 publications in 2008 to 5529 in 2017, with an average annual growth rate of 14.1%. King Saud University was the most productive institution. Most of the published research was done in collaboration with Egypt. The subject area of medicine was predominant with the main publication source being the *Saudi Medical Journal*, *Life Science Journal*, the Acta Zhengzhou University Oversea Version, and the *Annals of Saudi Medicine,* primarily in the form of original research articles. The growing trend in publications is a sign of the increasing quality of education and more research and development activities, which are made possible by a sufficient budget allocation to these activities during the last decade.

The Incidence and Risk Factors of Cholelithiasis Development After Bariatric Surgery in Saudi Arabia: A Two-Center Retrospective Cohort Study

Mohammed A. Aldriweesh., Ghadeer L. Aljahdali, Edi A. Shafaay, Dalal Z. Alangari, Nawaf A. Alhamied, Hadeel A. Alradhi, Amirah S. Yaqoub, Sami El-Boghdadly, ***Omar S. Aldibasi***, Abdallah A. Adlan

Frontiers in Surgery, 2020 Oct; 7:559064.

Background: Rapid weight loss after bariatric surgery is a known risk factor for cholelithiasis development. This study aimed to estimate the incidence of cholelithiasis following bariatric surgery among morbidly obese patients who underwent bariatric surgery.

Methods: This is a retrospective cohort study of all morbidly obese patients who underwent bariatric surgery in King Abdulaziz Medical City (Riyadh, Saudi Arabia) or King Abdulaziz Hospital (Al Ahsa, Saudi Arabia) between January 2015 and December 2018. Patients with a history of cholecystectomy or previous bariatric surgery were excluded. We estimated the incidence rate of cholelithiasis among the cohort. We also examined the associated risk factors of cholelithiasis development.

Results: The study cohort contained 490 patients (38.7% males; 61.43% females) with a mean age of 36.87 ± 11.44 years. Most patients (58.54%) were followed up for 12 months. The incidence of cholelithiasis post-operation was 6.53% (*n* = 32). The average period of cholelithiasis formation was 12–24 months. The percentage of total weight loss (TWL%) was significantly associated with the development of cholelithiasis post-operatively.

Conclusion: A significant association was found between weight loss following bariatric surgery and the incidence of cholelithiasis. Gender, age, and comorbidities were not associated with the formation of

cholelithiasis. We recommend regular follow-up appointments with thorough patient education about gradual weight loss to reduce the risk of developing cholelithiasis.

Keywords: gallstones, weight loss, cholecystectomy, BMI—body mass index, LSG, laparoscopic sleeve gastrectomy

Publication Output on Orthodontics Research in Saudi Arabia

Ikram Ul Haq. Ali Al Ehaideb, Azzam Al-Jundi.

Library Philosophy and Practice (e-journal), 2020; 3216.

Aim: The study aims to present a profile of orthodontics research carried out by Saudi Arabian affiliated authors.

Method: This retrospective study was carried out at King Saud bin Abdulaziz University for Health Sciences. The Web of Science, Clarivate Analytics database was used to obtain the targeted data-set on April 28, 2019. Keyword “Orthodontic” was used in the main search term and the Address option “Saudi Arabia” was written. All the records published up to December 31, 2018, included except letters and notes. The data has been analyzed by using bibliometric indicators, like year-wise distribution and growth; journal’s name, its publishing country and impact factor; national productive organization, international research collaborative institutions, productive authors and list of top cited articles. Microsoft Excel spreadsheet was used for data analysis.

Results: A total of 302 papers have been identified by Web of Science on Orthodontics with authorship affiliated to Saudi Arabia. These papers published during 24 years with an average of 12.58 papers per year. These publications received 1,348 citations with an average of 4.46 citations per paper. Majority of papers (n=265; 87.74%) published in the 109 international journals. One hundred and four papers published in 33 journals published from the United States. Top 15 productive organizations of Saudi Arabia, top international research collaborative organizations and productive authors have been calculated. Journals’ impact factor and their publications have also been discussed. Citation pattern of open access and subscription-based publication reveals that open access publications have less number of citations.

Conclusion: Upwards trendy of orthodontics research publications found in the recent past. Local researchers should be motivated to cite locally published literature to improve the citation impact of local literature. Research productivity would be increased by opening more postgraduate dental institutes in Saudi Arabia.

Keyword: Bibliometrics, Dental research, Orthodontics, Saudi Arabia

Reading Habits of Filipino Community Working in Riyadh, Saudi Arabia

Ikram Ul Haq, Ana Melanie Pacete, Gabriel Camalig, Sahar AlMosa.

Library Philosophy and Practice (e-journal), 2020 Jan; 3754.

Aim: The aim of this study is to assess the reading habit practices of Filipino community working in Riyadh, Kingdom of Saudi Arabia (KSA).

Method: A cross-sectional survey was conducted through a self-administrated structured questionnaire from September to November 2019 at Riyadh, Saudi Arabia. Fifty questionnaires have been distributed to Filipino nationals having a bachelor degree and at least two years of stay in KSA.

Results: Out of 50 participants, 36 (72%) Filipinos have responded, comprising the age group of 28 to 59 years with mean 41.25 ± 1.46. Most of the respondents like to use mobile-phone, sleeping, using a computer, watching television and spending time with family and friends during free time, only 9 (25%) respondents prefer to read. Filipino community mostly like to read religious books, literature and history. However, more than half of the respondents like to read soft copies of books. Three-fourth of the respondents read at least one book during the last three months and the Bible was found a favorite book. Half of the respondents have hard copies of books in their personal collections. Most of the respondents were not satisfied with the reading habit of the young generation.

Conclusion: Reading habit is a significant activity and an integral part of the lifelong learning process. Whether we are living in our country or abroad, reading should be part and parcel of our life. Reading really grow our spectrum of knowledge and understanding.

Keywords: Reading habits, Expatriate; Filipinos;

Bibliometric Analysis of Research Productivity of Neurosciences Research in Saudi Arabia from 2013-2018

Amani H. Alhibshi, Widyan A. Alamoudi, ***Ikram Ul Haq***, Shafiq ur Rehman, Rai K. Farooq, Foziah J Al Shamrani.

Neuroscience (Riyadh), 2020 Apr; 25(2):134-143.

Objective: To review the dynamics of neuroscience research in the Kingdom of Saudi Arabia (KSA) from 2013-2018.

Methods: Subject category of Neuroscience was selected in the SciVal feature of Scopus database, which includes all relevant categories of the field limiting it to Saudi Arabia.

Results: Saudi Arabia is ranked 39th in publishing neuroscientific research worldwide. The number of yearly published articles has increased from 123 to 332 during the time period between 2013 and 2018. King Saud University & King Abdul Aziz University & their corresponding regions namely Western and Central regions are the major contributors to publications. Neuroscientists working in Saudi Arabia have collaboration with scientists from all over the world. The top 10 preferred journals are all international. In subcategories of neuroscience, developmental neuroscience seems the one that needs attention.

Conclusion: Neuroscience research is on the rise in KSA. Older and well-established institutions like King Saud University & King Abdul Aziz University have taken lead in publishing neuroscientific research. International collaboration in all subfields of neuroscience is substantial. Eastern Southern and Northern regions and developmental neuroscience require more focus and funding.

A Scopus Based Bibliometric Evaluation of Saudi Medical Journal from 1979 to 2019

Muhammad Tanveer, Amiya Bhaumik, Shafiqul Hassan, ***Ikram Ul Haq***

Journal of Talent Development and Excellence, 2020 Jun;12(2s):2328-2337.

Aim: The main aim of this study is to assess the bibliometric parameters of the Saudi Medical Journal (SMJ) from the period of 1979 to 2019.

Methods: Quantitative Method were used in this paper. The publication record of SMJ has been retrieved from the Scopus-Elsevier database on 10th March 2020 for the research paper. In the main search-box,

the journal name “Saudi Medical Journal” was written and in the following box, the “Source Title” was selected. All the bibliographic records of documents published till December 2019 were downloaded in Comma Separated Value (CSV) file. The CSV file was converted into Microsoft Excel-2010 for data analysis. The bibliometric indicators of chronological growth, types of document, top-20 productive authors and contributing countries, as well as 10 most cited papers have been presented in tabulate and graphic patterns.

Results: A total of 7,700 documents were found in the Scopus database published in SMJ from 1979 to 2019 with an average of 187.80 papers per year. A majority of documents was consisted in the type of original research articles. King Saud University found a most productive organization with 1,006 documents. More than half of the documents (n=3879; 50.37%) were contributed by international researchers, Turkey has been on the top with 806 documents. A paper published in 2004 entitled “Diabetes mellitus in Saudi Arabia” was found to be the most-cited paper.

Conclusion: SMJ is a well-reputed and internationally recognized medical journal. There was gradual growth of publication in first 21 years but remarkable increase during first decade of 21st century but in the last decade, the editorial team of SMJ has been more focusing on quality than quantity.

Keywords: Saudi Medical Journal, Bibliometric, Research productivity, biomedical publications

Bibliometric research productivity analysis: A case study of Shifa Tameer-e-Millat University

Amir Latif, ***Ikram Ul Haq***

Journal of Shifa Tameer-e-Millat University, 2020 Jun; 3(1):49-55.

Objectives: This study is aimed to conduct a bibliometric analysis of research productivity of Shifa Tameer-e-Millat University (STMU).

Methodology: Data was collected from online resources from 2012 to 2018. The outcome parameters were the number of publications in each year, document type, scrutiny of the subject area, authorship pattern, research collaboration, frequently used journal and the range of references.

Results: STMU produced 231 documents with frequent references between of 20 to 29. Two-thirds of total publications consisted of original articles and Pharmacology was found to be the preferred area of research.

Conclusion: Research publication is the key element to measure academic performance. There has been a growing tendency in publications over the past three years.

Keywords: Bibliometric, scientific productivity, research, publications.

Research Output of Army Medical College, Pakistan: A bibliometric Study based on Scopus Database

Ikram Ul Haq, Midrar Ullah, Muhammad Tanveer.

Library Philosophy and Practice (e-journal), 2020 Aug; 3926.

***Purpose*:** The purpose of this study is to carry-out bibliometric analysis of publications by authors associated with Army Medical College, Pakistan using Scopus database.

***Methodology*:** All publications, published from 1977 to 2018, by the authors affiliated with Army Medical College, Pakistan were retrieved from Scopus database. The bibliographic records of all retrieved publications were downloaded in the Microsoft Excel. The data regarding phase-wise growth of publications; citations; subject distribution; the most prolific authors and journals; and research collaboration within Pakistan and abroad were analyzed and presented in tabular form.

***Findings*:** A total of 417 publications were found with an average of 9.92 papers per year. However, these publications were cited 2,524 times with a citation impact of 6.05 citation per year. Out of 417, 352 (68%) publications were published on Medicine. The most prolific author was Abdul Khaliq Naveed and Journal of College of Physicians and Surgeons Pakistan and Journal of Pakistan Medical Association were the most preferred journal with 84 and 82 publications respectively. The authors mostly collaborated with National University of Sciences and Technology within Pakistan and two Saudi universities outside Pakistan.

***Conclusion*:** Escalation in scientific productivity at Army Medical College was observed during the last decade. However, there is an urgent need to amplify research activities and collaboration with international organizations manifold to respectably stand with the world.

Keywords: Bibliometrics, Army Medical College, Pakistan; Research Productivity

Influence of lecture attendance and prerequisite academic achievement on dental students' performance in a clinical endodontic course: A correlational study.

Abdulmohsen Alfadley, Emad Masuadi, Tariq Awad Mohamed, ***Ahmed Jamleh***

Saudi Endodontic Journal, 2020 Sep-Dec;10(3):215-220.

Introduction: Decreased lecture attendance in undergraduate dental education has been observed worldwide. The limited studies on the influence of lecture attendance on dental students' performance have yielded inconclusive results. Hence, the aim of this study was to evaluate the influence of lecture attendance on dental students' academic performance and determine if the past performance of students in prerequisite courses is predictive of their performance in an endodontic course at College of Dentistry, King Saud Bin Abdulaziz University for Health Sciences, Riyadh, Saudi Arabia.

Materials and Methods: This was a correlational study design in which historical data for students (n = 158) enrolled in Endodontics II (ENDD 512) course were obtained for two consecutive academic years. Data were collected from grade transcripts provided by the assessment unit, and lecture attendance records were taken by the student affairs unit. The data were analyzed statistically. The level of significance (α) was set as 0.05.

Results: The percentage of lectures attended had a weak correlation with ENDD 512 final grades (r = 0.108, P = 0.179). Comparison to previous academic performance showed that endodontic course grades were strongly correlated with all prerequisite course grades (P < 0.01).

Conclusion: The students' performance in the course was most strongly predicted by their performance in certain prerequisite courses, while attendance was not a significant predictor.

Keywords: Dental education, endodontics, lecture attendance, performance, prerequisite courses

Knowledge Sharing Practices Amongst the Library and Information Professionals of Pakistan in the Digital Era

***Ikram Ul Haq*,** Rabiya Ali Faridi.

Cooperation and Collaboration Initiatives for Libraries and Related Institutions, IGI Global, 2020, 200-217. (Book Chapter).

Abstract: We are living in the age of an ever-changing knowledge-based society. Information, and most preferably knowledge, has been considered as a noteworthy resource for the development of any person, profession, institute, nation, and even all humanity on a larger scale. Knowledge sharing (KS) is a significant activity and an integral part of knowledge management. KS is substantial in building the capacity and learning development of library and information professionals. The aim of this article is to find out knowledge sharing practices among the library and information professionals working in different libraries in the Pakistani digital era. The study will be limited to the perceptual aspect of the issue, specifically from the respondents' opinions and their sentiments. Finally, the article highlights the role, skills and challenges for information professionals while sharing knowledge in the digital era of Pakistan.

Social Media Utilization among Dental Practitioner in Riyadh, Saudi Arabia

Abed A-H Hamasha, Nasser Alghofaili, Abdulrahman Obaid, Mohammed Alhamdan, Abdulrahman Alotaibi, Mohammed Aleissa, Menwar Alenazi, Faisal Alshehri, Amritha Geevarghese

The Open Dentistry Journal, 2019 Feb;13(1):101-106.

Objective: To assess the dental practitioners' use of social media, concerning demographic and social variables and the impact of social media use on dental practice.

Methods: The study was a cross-sectional analytical study of dental practitioners in Riyadh, Saudi Arabia. A self-administered 30-items questionnaire was distributed to 438 dentists, which included eight questions related to background and demographic information and 22 questions related to the use of social media within the dental practice. Data were entered and analyzed using *SPSS* software. Data analysis included frequency distributions and chi-square tests to assess the association of social media use with demographic and social variables and its impact on dental practice. Significant level was considered if *p* was less than 0.05.

Results: Of participating, 338 dentists, 52% were using social media in their practice. Twitter was the most commonly used (35%). Education was the primary purpose of using social media (43%), while entertainment was the least (8%). Approximately 62% and 68% are using social media for marketing of their dental practice and broadcasting treatment outcome, respectively. Social media was observed to be used significantly higher among Non-Saudi, general and private dentists. Participating dentists who used social media in their practice significantly recommended using social media to other dentists.

Conclusion: In general, non-Saudis, general practitioners and dentists practicing in private clinics are significantly using more social media during their practice. The majority of dental practitioners indicated that social media has improved their dental practice and become an indicator of successful practice.

Keywords: Conversational media, Dental literature, Dental practitioners, Social media, Saudi Arabia, Utilization.

Research Publications on Medical Microbiology in Pakistan during the period 2013-2017

Ikram Ul Haq, Gulnaz Elahi, Iqra Dana

Library Philosophy and Practice, (e-journal), 2019 Apr; 2253.

Aim: Research publications have been increasing all around the world in every field of knowledge including medical microbiology. The attempt has been made in this paper to describe the growth of medical microbiology research in Pakistan published from 2013 to 2017.

Methodology: Publications on medical microbiology with authorship to Pakistan indexed in the PubMed database were searched. The bibliographical citations of retrieved data were downloaded to examine the year-wise growth, authorship patterns, subject-wise distributions, institutional and country affiliation of the principal author. Microsoft Excel spreadsheet was used for data analysis.

Results: Three hundred and thirty-three documents with an average of 66.6 articles per year published from Pakistan during the projected period. Majority of papers (n=30; 9%) were written on the topic of epidemiology related to medical microbiology. Five-author pattern found to be the preferred collaboration trend. The evaluation of leading author affiliation revealed that 202 papers (60.6%) produced by Pakistani authors, while in remaining 131 (39.3%) papers, the principal authors belonged to 29 different countries of the world. Aga Khan University found a most productive institution with 35 papers. Targeted publications published in 175 different journals of the world, the highest number of articles (n=24; 7.21%) published in Pakistan Journal of Medical Sciences.

Conclusion: High tech research has a direct impact on the health and wellbeing of citizens. The analysis of research publications is important to scale to assess the productivity of a specific field of knowledge. Saudi Arabian researchers are striving well to achieve excellence in dental research by delivering quality education and provision of oral health care services to local community.

Keywords: Microbiology, publications; Pakistan; Biomedical publications

Pakistan Library and Information Science Journal: Bibliometric Review of a Decade (2008-2017)

Ikram Ul Haq, Khalid Alfouzan

Pakistan Library and Information Science Journal, 2019 Jun; 50(2): 85-97.

Abstract: The purpose of this paper was to conduct a bibliometric evaluation of Pakistan Library and Information Science Journal (PLISJ) from 2008 to 2017. The data of articles published in PLISJ in the specific period regarding research topics, authorship pattern, gender-wise distribution, geographical and institutional affiliation were collected and analyzed by using the Microsoft Excel spread sheet. Editorials, book reviews and letters to editor were excluded. There were 369 articles in both English and Urdu Languages. Majority of authors were male and single author trend was dominant. The contributors from Punjab and Sindh provinces were higher than other provinces. Bibliographic studies, Information Resources & Services; Interview of (Library and Information Science) LIS Professional and Library & Information Science Education were the preferred area of research. The research contributions from authors affiliated to the University of the Punjab Lahore was first, followed by the Islamia University of Bahawalpur and the University of Karachi. PLISJ needs to publish articles on emerging trends in LIS and articles should be peer reviewed to improve the quality of research papers.

Keywords: LIS Research, Pakistani authors, Bibliometrics, Pakistan Library and Information Science Journal, Citation analysis,

Al-Imam Mohammad ibn Saud Islamic University: A Bibliometric Research Profile

Sulaiman Khalid Al Fouzan, ***Ikram Ul Haq,*** Raken Khalid Al Fouzan

Library Philosophy and Practice (e-journal), 2019 Sep; 2768.

Aim: To investigate the status of research productivity and publication trends of Al-Imam Mohammad ibn Saud Islamic University (IMSIU) during the period of 2009 to 2018.

Method: A quantitative and retrospective research method was used. Publications data of IMSIU researchers have been retrieved from Scopus database published during the period of ten years from January 2009 to December 2018. The retrieved dataset has been transferred in Microsoft Excel spreadsheet to analyse the bibliometric indicators, as the growth of publications by year, subject stratification, national and international collaboration, frequently used journals and productive authors.

Results: IMSIU affiliated researchers have produced 2010 documents with an average of 201 documents per year. These documents received 12,594 citations, with citation impact of 6.26. Majority of the research has been conducted on the subjects of Engineering, Computer Sciences and Physics & Astronomy. King Saud University with 435 publications found top preference in research collaborative at the national level while at an international level, Université de Gabès, Tunisia with 159 publications stand on the top. Research collaboration analysis by country shows that Egypt is on the top 324 documents. Frequently used journals and 20 most productive authors in term of the number of publications have also been identified.

Conclusion: Growth in the tendency of publications was found by IMSIU expect the year 2017. Open access documents received a higher number of citations. The ratio of Scopus based publications in proportion to the number of faculty and students is not very encouraging. Young faculty and students should involve in the research process to enhance publication output.

Keywords: Research productivity; Al-Imam Mohammad ibn Saud Islamic University; Saudi Arabia; Publications

Bibliometric Appraisal on Dental Research at Kingdom of Saudi Arabia from 1998-2017

Ikram Ul Haq, Sulaiman Khalid Al Fouzan, Rakan Khalid Al Fouzan, ***Muhammad Nadeem,*** Amir Latif

Library Philosophy & Practice (e-journal), 2019 May; 2518.

Purpose: Scholarly research is considered as a yardstick to measure progress and development in any country, institution, or subject or individual. This study describes the growth of publications in the field of dentistry by researchers affiliated to the Kingdom of Saudi Arabia (KSA) during two decades from 1998 to 2017.

Research Design: This observational and quantitative analysis on dental research growth in KSA is based upon the data retrieved from Scopus database. This study was carried out at the College of Dentistry, King Saud bin Abdulaziz University for Health Sciences (KSAU-HS). Bibliometric indicators such as year-wise growth, productive author, research-type, source publication, productive national institutions, international research collaboration and collaborating countries have been used to illustrate research performance of KSA. Relevant bibliometric studies on medical and dental research have been reviewed. Microsoft Excel used for data analysis.

Key Findings: The results of the study provide various characteristics of dental literature published during the projected period. Total of 6,415 research items produced by 22 Arab countries, a share of KSA counted 2,427 (37.83%) documents. Nearly half of the research items (n=1,209; 49.81%) published during the last

three years from 2015 to 2017. Journal of Contemporary Dental Practice published 242 articles. King Saud University (KSU) appeared highest prolific national institution (n=938) and Alexandria University with 67 papers grasp top rank in international research collaborating institutions. United States (US) with 474 papers stood at the top in collaborating countries. Most of the papers have been written on the subject of dental procedures, resin, dental caries, tooth prosthesis and dental implants. Dr. Shankargouda Patil affiliated with Jazan University found as the most instrumental author with 60 publications in his credit.

Conclusions/Implications: Findings of this study illustrate that dentistry has been progressing over the years in KSA. High tech dental research has a direct impact on the oral health and wellbeing of citizens. KSA researchers are thriving for more informed dental practices and research-based education leading to quality oral health care to their community.

Keywords: dentistry; oral health research, Scholarly publication; bibliometric analysis; Saudi Arabia; Scopus; Biomedical publications

Research in Dentistry at Saudi Arabia: Analysis of Citation Impact

Ikram Ul Haq, Khalid Al Fouzan

Library Philosophy and Practice (e-journal), 2019 Sep; 2765.

Aim: The study aims to assess the Saudi Arabian publications on dentistry and their citation impact as reflected in the Web of Science (WoS).

Methods: WoS database categorized dental research under “Dentistry Oral Surgery Medicine”. Dental sciences publications with citation impact by Saudi Arabian affiliated authors produced during 2009-2018 have been searched by using suitable searching strategy and dental research of 10 randomly selected countries has been carried out for comparison. The downloaded data was transferred into Microsoft Excel format to measure the bibliometric indicators and citation impact of publications.

Results: A total of 1,771 documents on dentistry were published by Saudi Arabia from the time span of 2009 to 2018. These publications received a total of 10,320 citations with an average of 5.83 citations per paper. The subcategory of “Engineering biomedical” in dentistry got maximum citation impact. Review articles received higher citations as compared to original research articles. Dataset by organizations showed that the research carried out in the hospital sector have a higher number of citations as compared to teaching institutions. The research collaboration by Saudi Arabian authors with the researchers of the University of Michigan, USA got maximum citations while by country analysis shows that research collaboration with Italy, Germany and Japan have more citations as compared to the US, Egypt and England.

Conclusion: Although there is promising growth in dental research in Saudi Arabia, even then researchers need to write on the novel and innovative ideas to get global attention and citations. Articles published in Q1 impact factor journals and research collaboration with talent-rich countries got higher citations.

Keywords: Bibliometrics; Publications; Citation Impact; Dentistry; Scholarly Productivity; Saudi Arabia; Web of Science

Literature on Dental and Oral Health by King Saud bin Abdulaziz University for Health Sciences, Saudi Arabia; A Bibliometric Study

Ikram Ul Haq, Khalid Al Fouzan

Library Philosophy and Practice (e-journal), 2018 Jun; 1886.

Abstract: This present paper examines the bibliometric assessment of research performance on dental science literature by researchers affiliated to King Saud bin Abdulaziz University for Health Sciences (KSAU-HS), its teaching hospitals and Research Centre, to determine the statistical scenario and highlight

the emerging trends in dental research. It is a retrospective observational study that had been carried out in of College of Dentistry library, KSAU-HS during January 2018. Published research on dentistry in authorship affiliated to KSAU-HS was collected from different online sources; Web of Science, PubMed, Google Scholar, ResearchGate and the archival record of King Abdullah International Research Centre from inception of KSAU-HS to December 2017. Yearwise distribution of articles, subject-wise segregation, collaboration pattern, authorship, and most productive authors have been calculated. The data is analyzed by using Microsoft Excel 2010.The finding of the study exposed that 144 research items published in 84 different journals contributed by 586 authors with an average of 4.06 authors per article. The rising tendency in publication and collaborative research was observed, 68% articles published during 2015-2017. Original research article (72.22%) being favorite design and Public Health Dentistry (30.55%) found to be the most preferred area of research. Dr. Khalid Al Fouzan emerged as most productive author. Authorship and citations pattern had also been calculated. Assessment of dental research revealed that there has been a growing emerging trend in publications. It's the first bibliometric study on dental research in KSA, highlighted the collaboration style and pointed out the strong and weak areas of research.

Keywords: Bibliometrics; Dentistry; Saudi Arabia

Pakistan Journal of Pharmaceutical Sciences: A Bibliometric Assessment from 1998-2012

Zameer Hussain Baladi, ***Ikram Ul Haq,*** Manzoor Hussain, Gulnaz Elahi

Library Philosophy and Practice (e-journal), 2018 Feb; 1743.

Background: Bibliometric assessment of journal literature helps the policy makers to formulate policies regarding the related subject and to know the latest trends of publications. The pharmaceutical sciences are combination of various academics fields and technologies of pharmaceutical products related to design, action, delivery and nature of drugs. The aim of this study is to evaluate the research productivity of Pakistan Journal of Pharmaceutical Sciences (PJPS).

Research Methods: This is retrospective study on research items published in PJPS during 1998 – 2012 carried out at Libraries of King Saud bin Abdulaziz University for Health Sciences, Saudi Arabia during March to September 2017. The data was collected from the website of respective journal. Spreadsheet of Microsoft Excel was prepared for statistical analysis.

Results: PJPS published 722 articles contributed by 2504 authors with an average of 4.06 authors per article during the years 1998 – 2012. Male authors (67%) were dominated in writing research items. Majority of articles (97%) were written by multi-authors, single author share was very small (3%). Pharmacognosy found to be the most preferred area of research. The contribution from the researchers of 32 countries produced 329 (45.5%) articles revealed that the journal has international recognition.

Conclusion: PJPS creates a credible place for imparting the knowledge of pharmaceutical sciences research from all around the world, providing a platform to scientists and researchers to share their information to another one for saving a life.

Keywords: Pharmaceutical science; Bibliometrics; Research Productivity

Implementation of an Outcome-Based Longitudinal Pharmacology Teaching in Undergraduate Dental Curriculum at KSAU-HS Experience

Abdulmalik Alkatheri, Abdulkareem M. Albekairy, Mahmoud Mansour, Wesam Abdel-Razaq, ***Ali Al-Ehaideb***, ***Khalid S. Al-Fouzan***, Amjad M. Qandil

Health Professions Education, 2018 Jun;4(2):115-126.

Purpose/objectives: The aim of this study is to present a modification of the structure of the pharmacology educational experience for dental students as a result of the early introduction of a pharmacology course into the pre-professional curriculum.

Methods: Three courses of professional dental pharmacology were modified before and/or after delivery by developing general course learning outcomes, lecture-by-lecture learning outcomes and theme mapping to align topics taught within these courses and with those taught in the pre-professional dental program.

Results: Final proposals for three professional dental pharmacology courses, which are distributed over three professional years, were prepared based on teaching experience and theme mapping. Topics were added, deleted, transferred from one course to another to afford courses that are fully aligned, relatively comprehensive, longitudinal, with focus on topics relevant to the dental practice without redundancy. In addition, the design of these courses took into consideration the level of coverage of the pre-professional dental pharmacology course.

Conclusions: This longitudinal inclusion of pharmacology courses form the second pre-professional year to the third professional year is expected to improve dental students' pharmacology education experience. Although the last of these courses is a pharmacotherapeutic course, more courses with clinically oriented therapeutic approach are recommended.

Keywords: Pharmacology course design, Dental students, Curriculum development, Curriculum mapping

Mapping the Research Productivity of Three Medical Journals Published in Saudi Arabia: A Comparative Bibliometric Study

Ahmad A. Alanazi, Zameer Hussain Baladi, ***Ikram Ul Haq***

Library Philosophy and Practice (e-journal), 2018 Sep; 2053.

Introduction: The purpose of this study was to compare the progress of research outcomes specifically of three old and new established Saudi medical research journals: Saudi Journal of Medicine and Medical Sciences (SJMMS), Journal of Saudi Heart Association (JSHA), and Journal of Infection and Public Health (JIPH) for the period of 2013 to 2017.

Materials and Methods: Scientific papers under the titles of original and review articles, short communications, case and short reports were downloaded from the websites of these journals. The data was analyzed according to three parameters: the growth of publication, the types of publication, and the authorship pattern.

Results: The findings of the study revealed that 827 articles were contributed by 3808 authors with an average of 4.6 authors per article, and 12.9% articles were published in 64 issues of SJMMS (n=600, 15.7%), JSHA (n=951, 24.9%), and JIPH (n=2257, 59.2%) during 2013–2017. The majority of articles (n=746, 90.2%) included more than one author, leaving only 81 articles (9.7%) were prepared by single (or solo) authors. The authors have been collaborated with national and international authors for their scholarly work.

Conclusions: The comparison of bibliometric indicators of the three medical journals showed the rising tendency of research publications and the high rate of collaborative research output. These journals contributed a massive number of research papers during the period of five years. Collaboration among researchers facilitates sharing knowledge and techniques and brings a mixture of positive scientific

thoughts. The unified bylaws for faculty in Saudi universities should give more weight to multi-authored papers.

Keywords: Bibliometric; Collaboration; Medical Sciences; Research Productivity; Saudi Arabia.

Comparative Bibliometric Analysis of Six Health Sciences Journals Published in Pakistan 2006-2015

Zameer Hussain Baladi, ***Ikram Ul Haq***

Library Philosophy and Practice (e-journal), 2018 Dec; 2001.

Introduction: The aim of this study is to compare the growth of research published in following six e-journals published from Pakistan during the period of 2006-2015. 1). Journal Surgery of Pakistan, 2). Pakistan Journal of Medical Research, 3). Pakistan Pediatric Journal, 4). Pakistan Journal of Ophthalmology, 5). Pakistan Heart Journal and 6). Journal of Liaquat University of Medical & Health Sciences.

Methodology: The data of published items of all targeted six Pakistani medical journals were downloaded from their respective websites and saved the required information in Microsoft Excel Sheet during January to May 2018 for statistical analysis. Number of published items, authors, gender-wise segregation of authors and authorship pattern were calculated.

Results: Total 2133 research items published in 230 issues of six e-journals during 2006- 2015 with an average of 9.27 articles per issue, 7949 authors contributed their research with an average of 3.72 authors per papers. Gender-wise distribution of authors showed that majority of authors (n=6022; 75.7%) were male while female authors counted 1921 (24.1%). Gender-wise distribution of first author revealed that the share of female authors were 28.2%. Bulk of research (n=1951; 91.4%) were produced by collaborative efforts.

Conclusion: It is concluded that surgery and allied specialties is the preferred area of research and there is need to conduct more research on cardiology. Most of the papers were written in collaborative efforts and three authors pattern was found most favorite.

Information Needs and Seeking Behavior of Medical Students at Foundation University Medical College, Pakistan

Amir Latif, Zia Ahmed, Naveed Ahmad Satti, ***Ikram Ul Haq***.

Indian Stream Research Journal, 2017 Apr; 7(3):1-9.

Background: This study investigated the information needs and seeking behavior of medical students at the Foundation University Medical College, Islamabad.

Methods: A structured questionnaire was designed keeping in view the objectives of the study. One hundred sixty-three students participated in this study, 116 respondents were female while 47 were male. Data were analyzed by using the descriptive statistics which included; frequency, percentage, mean and standard deviation.

Results: Most of the students used information technology for entertainment purpose, as compare to academic use and searching web resources. Response concerning to the importance of libraries/online sources, general awareness purpose was rated high. Almost half of respondents didn't scan/read any print journals for study purpose, as undergraduate medical students mostly rely on their textbooks and notes.

It was revealed that most of the students did not face any problem in managing their time for information seeking.

Conclusion: It is recommended that library should improve the library orientation / information literacy programs for encouraging meaningful use of information technology.

Keywords: Medical students, Information needs, information seeking-behavior, search engines.

Research Productivity at King Saud bin Abdul Aziz University for Health Sciences, Kingdom of Saudi Arabia: A Bibliometric Appraisal

Ikram Ul Haq, Khalid Al Fouzan

Journal of Rawalpindi Medical College (JRMC), 2017 Sep;21(2):182-186.

Background: To examine the research outcome having an authorship affiliated with KSAU-HS, its teaching hospital and King Abdullah International Medical Research Centre (KAIMRC) since the inception of the university to December 2015.

Method: Data retrieved from Institute of Scientific Information (ISI) Web of Science, InCiteTM Database of Thomson Reuters, which produced the list of 775 research documents published in 346 different journals. Some bibliometric indicators such as annual growth, subject segregation, authorship pattern, collaboration etc. had been used to illustrate the research performance of researchers. The data was analyzed by using SPSS 20.

Results: Majority of articles (15.35%) were written on the subject of medicine, bulk (94%) of the research work had been carried out by collaborative efforts. In 475(61.29%) publications, the principal author belonged to KSAU-HS. Majority of the research work (64.65%) had been produced by the collaboration of other organizations. Research cooperation with the universities of United States was highest, followed by Canada and Pakistan.

Conclusion: There is promising growth in biomedical publication and collaborating research trends are increasing.

Keywords: Biomedical publications, Saudi Arabia, Research productivity

Oncology Research Outcome by King Saud bin Abdulaziz University for Health Sciences, Kingdom of Saudi Arabia; A Bibliometric Appraisal

Ikram Ul Haq, Khalid S. Al Fouzan, Zameer Baladi

International Journal of Library Science, 2017 Oct;6(3):52-57.

Abstract: Bibliometric studies have been carried out to assess the research productivity in the different field of knowledge. Kingdom of Saudi Arabia plays a leading role in the field of medical research in all Arab States. There are 64 universities and degree awarding institutions in KSA, King Saud bin Abdulaziz University for Health Sciences (KSAU-HS) established in 2005. The aim of this study to assess the oncology research outcome having an authorship affiliated with KSAU-HS, its teaching hospitals, and King Abdullah International Medical Research Centre (KAIMRC) published during the inception of the university to Dec 2015. Data retrieved from Institute of Scientific Information (ISI) web of science, InCiteTM Database of Thomson Reuters, which produced the list of 775 research documents published in 346 different journals, out of these 45 articles are written on the subject of oncology in 19 different journals. Majority of articles (91.11%) are written in collaborative efforts. In 33 (73.33%) publications, the principal author

belongs to KSAU-HS, its associated hospital and research center. Almost half of the research papers (55.55%) are written in collaboration with researchers at other universities/hospitals and organizations. This study is only based on the bibliography produced by ISI's Web of Science database. The articles produced by KSAU-HS may be more than this number. The data was analyzed by using MS-Excel 2010.

Keywords: Oncology research, Research productivity, Bibliometric analysis, Saudi Arabia, InCites™ Web of Science, Biomedical publications

Research on Therapeutics at the King Saud bin Abdulaziz University for Health Sciences: A Bibliometric Assessment

Ikram Ul Haq, Khalid Al Fouzan, Pervaiz Ahmad.

International Journal of Librarianship and Information Sciences (IJoLIS), 2017 Jan-Dec; 2:31-47.

Purpose: To carry out the bibliometric assessment of research output on 'Therapeutics' by authors affiliated with King Saud Bin Abdulaziz University for Health Sciences (KSAU-HS), its teaching hospital and research centre.

Design/methodology/approach: Articles having MeSH keyword 'Therapeutics' were retrieved from PubMed, a database of the United States National Library of Medicine, which produced the list of 161 research documents published in 105 different journals from the inception of KSAU-HS to 20th September 2017. Year-wise distribution of research items, segregation of local and international journals, most productive authors, and major area of research had been calculated. The data were analyzed by using Microsoft-Excel 2010.

Key finding(s): The finding of the study reveals that the majority of articles (90%) is written in collaborative efforts. In 125(77%) publications, the principal author belongs to KSAU-HS, its associated hospital and research Centre. Almost half of the research papers (51.55%) have been produced in collaboration with researchers of other universities I hospitals and organizations. More than half (54.03%) of articles are published during January 2014 to December 2016. Research Articles are preferred type of writing and Medicine and Urology are the favorite area of research. Ninety-eight (60.86%) articles appeared in 68 journals published from two countries; United States (n=38; 36.19%) and United Kingdom (n=30; 28.57%). Arabi found to be the most prolific author with 37 articles. Most of the research (n=77; 47.82%) is done within KSAU-HS, 57 articles (35.40%) are shaped out with international collaborators and 27 articles are written with researchers affiliated by 16 organizations located in Saudi Arabia.

Research Limitation(s): This study is limited to the bibliography produced by PubMed database on 20th September 2017 with MeSH keyword, Therapeutics. The quantity of articles produced by the researchers of KSAU-HS on "Therapeutics" may be more than this number.

Practical implication(s): This case study provides an insight of the publication trends in a selected field of study that may (a) be used to take corrective measures, where needed, and (b) motivate other counterparts to initiate the similar research in their field/institution.

Contribution to knowledge: Research output in a university environment is an important gauge to evaluate the productivity of faculty members. This study fills the gap of bibliometric research in a particular field and institution in Saudi Arabia. Paper type: Research.

Keywords: Therapeutics; Research productivity; Journal/article publication trends; PubMed; Biomedical publications; Saudi Arabia.

A Bibliometrics Study of Pakistan Pediatric Journal (PPJ): 2015–1996

Zameer Hussain Baladi, Mohammad Khalaf Al Mutairi, Nesrin Al Harthy, ***Ikram Ul Haq.***

Pakistan Pediatric Journal, 2017 Dec;41(4):243-248.

Introduction: Pakistan Pediatric Journal (PPJ) is quarterly peer reviewed journal publishing since 1977 without interruption. PPJ accepts original articles, review articles, case reports, drug reviews on medical and subspecialties of basic and social sciences in the field of pediatrics.

Methodology: This statistical analysis was conducted during mid-August 2016 to mid-December, 2016. The data for study was downloaded from websites of e-journal of Pakistan Pediatric Journal http://www.pakpedsjournal.org.pk/Default.aspx and Pak MediNet (http://www.pakmedinet.com/)

Results: A total number of 583 articled were taken from PPJ in 20 volumes and 65 issues during 2015-1996. The maximum and minimum articles published were 48 and 7 during the years 2014, 2013 and 2004. Majority of articles were written by multiple authors [155 (26.59%)] followed by 82 (14.07%) by single author. The highest single city was Lahore, Pakistan produced 295 (50.60%). A gender-wise comparison among the contributing authors revealed 1455 (73.97 percent) were male to be higher than the 512 (26.03 percent) were female out of a total of 583 articles published during 2015-1996. Conclusion: This study proved that there is growing trends in the publications on the subject of pediatric research in Pakistan. Joint research activities have been carried out at national level but there is need to conduct more research with international collaboration. Strong and weak areas of research have also been identified.

Keywords: Pediatrics, neonatology, toddlers

AIDS Awareness: Indispensible Prerequisite Among Fishermen Population

Swapna B. Shetty, Darshan D. Divakar, M.H.N. Dalati, Sajith Vellappally, Sukumaran Anil, ***Marey A. Alshehry***, Baher Felemban, Al S. Mamdouh, Obaid A. Alshahrani

Osong Public Health and Research Perspectives, 2016 Oct;7(5):327-333.

Objectives: Fishermen are among the most vulnerable groups for human immunodeficiency virus (HIV)/AIDS with reported high prevalence. Poor knowledge base has been evidenced by a few studies. The present study was conducted to assess the knowledge regarding HIV/AIDS among fishermen of the Kutch coast, Gujarat, India.

Methods: A descriptive cross-sectional study was conducted among 950 fishermen of the Kutch coast, in the months of January–February 2015. Knowledge of HIV/AIDS of fishermen was assessed using structured interview schedules with 12 questions. The information on socio-demographic characteristics was also obtained. Chi-square test and multivariate logistic regression analysis were used for statistical analysis. The confidence level and level of significance were fixed at 95% and 5%, respectively.

Results: A major proportion of participants (57.2%) had no access to any potential source of information and had never heard about HIV/AIDS (65.1%). Some of them were aware of modes of transmission of AIDS but only a few of them knew about the methods of prevention. Only 23.1% of participants were observed with appropriate knowledge regarding HIV/AIDS. Bivariate and multivariate analysis revealed significant variation in the proportion of participants with appropriate knowledge with age and educational status.

Conclusion: Overall, the knowledge of the fishermen community in the present study was evidenced to be poor creating an alarming situation demanding educative interventions as a part of AIDS control programs.

Keywords: HIV/AIDS, India, knowledge, occupational medicine

AUTHOR INDEX
(Faculty Members)

3 Author Index

Abdulaziz A. Alzaid, BDS, MS
Prosthodontics

1. Mathew T. Kattadiyil, Abdulaza A. Alzaid, Stephen D. Campbell. The Relationship Between Centric Occlusion and The Maximal Intercuspal Position and Their Use as Treatment Positions for Complete Mouth Rehabilitation: Best Evidence Consensus Statement. Journal of Prosthodontics. 2021 Apr;30(S1):26-33.

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