

DENTSPLY SIRONA/ADHA GRADUATE STUDENT CLINICIAN RESEARCH ABSTRACTS

The following abstracts are from the participants of the 2017 Annual Dentsply Sirona/ADHA Graduate Student Clinician's Research Program. The purpose of the program, generously supported by Dentsply Sirona since 2007, is to promote dental hygiene research at the graduate level. Dental hygiene post-graduate programs may nominate one student to participate in the program and present their research at ADHA's annual conference.

*Indicates poster presenter

Theory Based Development and Beta Testing of a Smartphone Prototype App Developed as an Oral Health Promotion Tool to Influence Early Childhood Caries

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Purpose: The aim of this study was to develop and test a smartphone prototype app, ToothSense as an oral health promotion tool for the prevention of Early Childhood Caries (ECC).

Methods: The app development process used quantitative and qualitative design included the following steps: Phase 1 application design and development based on the Theory of Planned Behavior to document the design of applications features accounting for Doshi's Intervention Strategies for the TPB; Phase 2 beta-testing of the application using quantitative and qualitative measures utilizing an online software UserTesting® to host beta testing with a series of tasks and prompts followed by a 5-point Likert-scale questionnaire that quantitatively measured perceptions of ToothSense's interaction design based on Jakob Nielsen's principles and behavioral strategies. A Net Promotor Score was calculated to determine likelihood to recommend ToothSense. Using a template approach, audio and video were qualitatively measured.

Results: Beta testers agreed the app met the majority of the five usability statements. The Net Promotor score indicated a likelihood to recommend ToothSense. The thematic analysis revealed the following themes: Interface Design, Navigation, Terminology, Information, and Oral Health Promotion.

Conclusion: This research provided health promotion project design information and highlighted the importance of health promotion application usability.

Relationships of Somali Mother-Child Caries Experience

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Purpose: Dental caries experience among immigrants upon migration is often lower than that of a comparative United States-born population (US); this advantage is quickly reversed with US residency. Growing evidence indicates maternal oral health is a predictor of child caries. This has not been confirmed among immigrant populations. This study was designed to explore the correlation between caries experience of Somali immigrant mothers and their children. The study further investigated the association of oral health perceptions and caries experience of Somali mothers.

Methods: A community-engaged approach was used enroll 75 mother-child dyads at 9 urban day care centers. Clinical data was collected utilizing decayed, missing and filled surfaces for the mother-child dyads. A survey compiled from previously validated instruments designed specifically for this study was completed by each mother. Descriptive statistics, Spearman's correlation and linear regression modeling were used to analyze the data.

Results: The mean age of mothers and children was 33.8 and 8.2 years, respectively. Mothers had lived in the US an average of 9.6 years. Almost all mothers and children were insured, and 68.6% of children reported having had a dental visit within the past year. No correlation was found between Somali mother-child caries experience. There was a statistically significant positive association between mother oral health perception and caries experience.

Conclusions: The oral health of a Somali child is not similar to their mother's. Somali mothers' self-perception of oral health reflects their own caries experience. Practical applications include designing an intervention using a community-engaged process to prevent caries in children's primary teeth.

A Study of Visible Tattoos in Entry –Level Dental Hygiene Education Programs

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Developing an observational method for assessing dental hygienists' injury risk

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Purpose: The purpose of this study was to survey entry-level dental hygiene program directors in the United States (US) to assess their perceptions of dental hygienists with visible tattoos as well as to determine current policies related to dress codes in US dental hygiene programs.

Methods: Data was collected with an online survey emailed to 340 dental hygiene program directors from March to April 2016, yielding a 43% (n=141) response rate. Participants indicated their opinions of visible tattoos on the basis of professionalism and school policy requirements.

Results: Eighty percent of respondents reported their program had dress code policies on visible tattoos, with the majority (97%) requiring visible tattoos to be covered.

Results revealed that both students (M=5.57, $p<.0005$) and faculty (M=5.76, $p<.0005$) with visible tattoos were perceived as being significantly less professional. Most participants agreed that faculty should discuss the impact of visible tattoos on future employment opportunities, and that the surrounding community would view the school as less professional if students had visible tattoos ($p<0.0005$). Tolerance toward tattoos in general ($p<0.001$), but not age, ($p=0.50$), was significantly associated with satisfaction concerning the dental hygiene program's tattoo policies. A lower tolerance towards visible tattoos ($p<0.001$) was associated with an increased likelihood that there was a program dress code policy on visible tattoos.

Conclusion: Results showed that visible tattoos were not perceived favorably in general, and that the dental hygiene program director's personal perceptions may have influenced existing school dress code policies. These findings provide evidenced based information for hygienists, students, faculty, administrators and hiring managers as they formulate institution policies relating to body art.

Problem: Dental hygienists have a high prevalence of work-related musculoskeletal disorders (WMSDs) due to repetitive motions and sustained postures. No standardized method exists for evaluating risk factors in the clinic. The purpose of this study was to evaluate risk for WMSDs in dental hygienists using video observations.

Methods: Videos of five volunteer student dental hygienists were obtained during patient care for this IRB approved study. Two stationary cameras captured a wide-angle view of body positions and a close-up view of the hand and wrist during scaling. Videos were coded by activity, time spent in each clock-position (CP) and area of the mouth (AOM). Sustained postures (i.e., >45-sec in one CP/AOM) were evaluated using the rapid upper limb assessment (RULA).

Results: Average appointment time was 178 minutes (2.9 hours). Instrumentation took 57% of appointment, 82% of which was spent performing hand scaling. Students worked most frequently in the 9-CP (40% of the time), with equal time in each AOM. Sustained postures were noted in 71 video segments. Overall RULA scores were distributed around modes of 4 and 6, and the most frequent poor postures were wrist flexion and neck flexion. 18% of video segments were unable to be assessed due to a blocked view.

Conclusions: RULA scores of 4-6 indicate moderate risk for these students. The observational method was found to be feasible; however, adding a third view may improve analysis of sustained postures. Additionally, assessing hand strain during scaling may assist in evaluating risk for WMSDs.

Faculty Calibration with Instructional Videos for Head and Neck Examinations

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Purpose: Calibrating faculty for clinical teaching is essential to providing a high-quality education for students in dental hygiene education. However, academicians have struggled to determine effective methods to increase faculty consistency in teaching. The primary objective of this pilot study was to evaluate the effect of an online head, neck, and oral-cancer examination instructional technique video for dental hygiene faculty knowledge. Additional objectives were to assess if years of teaching and/or clinical experience or type of faculty position affected test performance.

Methods: Using a repeated measures design after receiving IRB exemption, the primary investigator invited 24 dental hygiene (DH) clinical faculty to participate by completing an online pre-test, viewing an instructional technique video and immediate post-test, and four-month follow up retention test. Statistical analysis was completed with SPSS using Spearman Correlation Coefficient and t-tests.

Results: Pre-test response rate was 79% (N=19) with 95% (N=18) completing all four components of the study. Results demonstrated mean pre-test scores of 68%, post-test score of 76%, and retention test score of 80%. Mean scores increased 15.7% from pre-test to post-test, decreasing 2.8% from post-test to retention test. There was no significance between years of clinical experience with either test score or faculty grouping. There was significance between years of teaching experience and lower pre-test scores.

Conclusions: The use of an instructional technique video increased the knowledge level of DH clinical faculty for head, neck and oral-cancer examinations. Future research should investigate methods measuring if student performance of the examination is calibrated in other settings with larger numbers of faculty.

General Dentists' Perceptions of Dental Hygienists' Professional Role: A Survey

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Purpose: Changes in dental hygienists' scope of practice in the United States (US) are not independent of general dentists' attitudes and behavior related to professional roles of dental hygienists. The purpose of this study was to assess general dentists' perceptions of what dental hygienists can legally perform in their state vs. what is performed in their practice; the level of importance of dental hygienists' contributions to their individual practice; and how well dental hygienists interacted with dentists and patients. Additionally, the relationships between dentists' attitudes, and dental hygienist/employee actual behavior, dentists' age and number of hygienists and assistants were also explored.

Methods: Survey data were collected from 292 general dentists in Michigan concerning their attitudes and behavior related to dental hygienists' scope of practice and contributions to their dental practices.

Results: The average numbers of services hygienists provided in their professional practice were lower than the average number of services they were legally permitted to provide in the state of Michigan. The more importance dentists placed on their dental hygienists' clinical contributions, contributions to their practice and their patient management skills, the more diagnostic services and therapies their dental hygienists performed. The older dentists were, the more important they rated their dental hygienists' clinical contributions and their hygienists' importance for patient care, and the more diagnostic and other procedures their hygienists performed.

Conclusions: While dentists did not utilize their dental hygienists optimally, they had a very high appreciation of their hygienists' contributions to their practice. There was a positive correlation between the perceived value of hygienists' contributions and the number of diagnostic and other services with which they entrusted their hygienists.

Oral Manifestations of Menopause: An Inter-professional Intervention for Dental Hygiene and Physician Assistant Students

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Perceptions of Dental and Dental Hygiene Students Regarding Intraprofessional Education

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Purpose: Interprofessional education (IPE) is a means of fostering integration and collaboration between health care professions. This study evaluated the effect of an IPE educational module on the oral manifestations of menopause.

Methods: This mixed-method study used a convenience sample of dental hygiene (DH) and physician assistants (PA) students. Pre- and post- tests collected quantitative data using a modified Readiness for Interprofessional Learning Survey (RIPLS), and a principle investigator (PI)-designed knowledge of menopause test to determine students' attitudes and learning. Students participated in a one-time workshop that included an educational presentation and a case study exercise using a pseudo-standardized patient. Students worked in preselected groups, representing both disciplines, to create a patient care plan addressing oral manifestations of menopause. Qualitative data was collected from student comments.

Results: Study results indicate an increase in participants' knowledge of oral manifestations of menopause ($p < 0.05$). Additionally, results suggest improved attitudes toward interprofessional teamwork and collaboration ($p < 0.05$), positive professional identity ($p < 0.05$), roles and responsibilities ($p < 0.05$ for IPEC core competencies RR1, RR2, RR3, RR4), interprofessional communication ($p < 0.05$ for IPEC core competencies CC3, CC4, CC). Qualitative data from IP care plan formulation and debriefing demonstrated facilitation of gained confidence in applying new skills related to oral manifestations of menopause.

Conclusion: Implementation of an IPE intervention demonstrated correlation between an IPE experience and participants' attitudes, learning, and confidence. Patients experiencing menopause are prone to oral manifestations. Therefore, preparing health care students interprofessionally to meet the needs of menopausal women may ultimately decrease oral discomfort and improve the quality of life.

Purpose: Dental and dental hygiene students are expected to work together to provide patient care following graduation from their respective education programs. In general, pre-doctoral (DDS) students and dental hygiene (DH) students receive separate education and training which prevents the full understanding and appreciation of each other's roles as part of the dental team. Recent focus has been on evaluating education between the various health care professions but limited attention has addressed intraprofessional education. The purpose of this study was to determine the perceptions of DDS and DH students regarding intraprofessional education.

Methods: A 29-question survey was sent via Qualtrics, to 24 institutions that educate both DDS and DH students. The survey was sent to DH program directors and DDS academic deans, who in turn forwarded the survey to their respective students. A total of 151 students ($n = 151$) representing programs from 16 states completed the survey.

Results: Results showed 45% of the respondents stated DDS and DH students took didactic courses together and 70.9% stated their clinics are integrated with both disciplines. 97.8% strongly agreed or agreed that learning with other DDS and DH students would help them become more effective members of an oral health care team; 97.7% strongly agreed or agreed patients would ultimately benefit if DDS and DH students worked together to solve problems; 98.5% strongly agreed or agreed that learning together prior to graduation would improve future professional relationships in the workforce; and 94% strongly agreed or agreed they wanted to have time learning together.

Conclusion: Overall, DDS and DH students believe they would be able to become better members of the oral health care team if their education and training was integrated together and institutions should look for opportunities where intraprofessional education can be utilized.

Perceptions of Oral Cancer Screenings Compared to Other Cancer Screenings: A Pilot Study

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Perceptions of Registered Dental Hygienists in Alternative Practice Regarding the Use of Silver Diamine Fluoride

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Purpose: The purpose of this pilot study was to compare public perceptions of Idaho adults regarding oral cancer (OC) screening with other common cancer screenings including breast cancer (BC), prostate cancer (PC), and colon cancer (CC) screenings.

Methods: This study utilized a convenience sample (N=100) of Idaho residents. A self-designed, validated interview-administered questionnaire was administered by a data collection service using computer-assisted telephone interview software to assess consumer perceptions about cancer screenings. Data were analyzed using descriptive statistics, frequencies, and Pearson's Chi-Square tests.

Results: Participants were predominantly white (90%) with a mean age of 52.7 years and some post-high school education (80%). The majority had received OC screenings (54%), perceived benefits of each cancer screening as very helpful: (a) OC screening (60%), (b) BC screening (79.2% females), (c) PC screening (63.8% males), and (d) CC screening (84%), and reported perceiving no risks regarding OC (80%), BC (60.4%), PC (66%) screening. Only 11% reported fear of finding cancer with OC screening. The findings supported significant associations ($p < 0.05$) between consumer perceptions of cost and time as barriers to all of the selected cancer screenings.

Conclusion: This study identified associations between consumer perceptions of OC screening when compared with BC, PC, and CC. Concerns about cost and time for cancer screenings may reflect low consumer awareness regarding differences between OC and other cancer screenings. Future studies including larger samples representing more diverse populations are recommended to further explore the basis of participants' perceptions and to identify ways to minimize barriers to cancer screening.

Purpose: Silver diamine fluoride (SDF) is an inexpensive, non-invasive, antimicrobial liquid used to treat carious lesions and decrease sensitivity. The purpose of this study was to assess the perceptions of registered dental hygienists in alternative practice (RDHAP) regarding the use of SDF to treat dental caries.

Methods: A 16-item survey to evaluate RDHAP's familiarity and perceptions of SDF was electronically distributed to 222 RDHAPs in the state of California. A survey research software program collected and tabulated responses, calculated response frequencies for each survey item, and determined statistical relationships among variables, using cross tabulation analysis.

Results: The response rate was 46%. Over half the respondents were unfamiliar with SDF. After describing SDF's properties and uses, 78% of respondents agreed that applying SDF to treat dental caries would be within the RDHAP scope of practice. Respondents agreed that patients or their parents would be interested in using SDF because it is an alternative to removing tooth structure with a dental drill to place restorative material (82%), less expensive than restorative treatment (82%), applied like a varnish and time efficient (86%), and utilized without local anesthesia (91%). Over half (56%) of the respondents agreed that many patients or parents of patients would object to the permanent black staining of the carious lesion. Respondents' employment/practice settings were related to their agreement that SDF is within the RDHAP scope of practice ($p < 0.01$) and their disagreement that patients would not accept SDF treatment due to the black staining ($p = 0.03$). According to 88% of respondents, the advantages of SDF outweigh the disadvantages for their patient populations.

Conclusion: SDF would be a useful caries therapeutic agent in RDHAP practices of the underserved populations.

The Use of Technology in Academic Dishonesty with Dental Hygiene Programs

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Purpose: Cheating behaviors have been common in academia for decades. With the evolution of technology, information is more readily available than ever. The purpose of this study was to investigate the self-reported habits of dental hygiene students regarding the use of technology and academic dishonesty at seven accredited dental hygiene programs in the state of Missouri.

Methods: A total of 274 dental hygiene students were contacted to take an online survey. Thirty-nine students responded to complete the survey (n=39) for a response rate of 14%. An original survey instrument developed by Muhney, et al (2008) was utilized along with the additions of questions relating to technology. The instrument contained 31 questions that included open-ended, yes/no, and Likert scale type questions. This IRB approved study included a confidential survey obtained through REDcap. Data were analyzed using SPSS with frequencies and chi-square tests.

Results: Findings revealed that 37.9% of the respondents had participated in some form of cheating behavior during the time spent in their dental hygiene program. Of the total respondents, 51.3% felt that technology increases the likelihood that others have or will cheat. Of the 62.1% of students reporting that they had never cheated, 33% reported allowing other students to copy their work; 16.6% reported copying an assignment from another student and another 16.6% reported that they had falsely recorded vital signs.

Conclusion: Dental hygiene students have used technology to engage in academic dishonesty and many feel that technology is a catalyst to cheating behaviors. While the dental hygiene students surveyed, indicated that cheating is unfair, many expressed uncertainty as to what constitutes cheating.