

## 2023 Dentsply Sirona/ADHA Graduate Student Research Abstracts

The following abstracts are from the participants of the 2023 Dentsply Sirona/ADHA Graduate Student Clinician Research Program. The purpose of the annual program, generously supported by Dentsply Sirona for the past 16 years, is to promote original dental hygiene research at the graduate level. Dental hygiene post-graduate programs may nominate one student to participate and present their research at the Annual Conference of the American Dental Hygienists' Association. The following posters were presented at the ADHA Annual Conference, July 7-9, 2023, in Chicago, IL.

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### Experiences of Dental Hygienists as Myofunctional Therapists\*\*

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**\*\*First place award recipient**

**Purpose:** The purpose of this study was to explore the trend of registered dental hygienists' (RDH) education, certification, and practice of orofacial myology. Additionally, this study sought to define the advantages and barriers of the certification process.

**Methods:** The design of this study utilized a phenomenological heuristic qualitative research approach. Purposeful sampling was used to solicit participants with experience in orofacial myology through the International Association of Orofacial Myology (IAOM), Academy of Orofacial Myofunctional Therapy (AOMT), Breathe Institute, and Neo-Health Services. Semi-structured interviews, the primary investigator's personal experiences, and historical documents were used for triangulation of the collected data to uncover emerging themes.

**Results:** Data analysis of semi-structured

interviews, researcher field notes, and historical documents resulted in five synthesized conceptual models and twenty-five emergent sub-themes. The conceptual models include: need for uniform credentialing, autonomous workforce models, identity distinctiveness, business management, and access to myofunctional care.

**Conclusion:** Dental hygienists shared the opinion that though costly and complex, this specialty deserves attention, identity, awareness, and perpetuation as an expansion of preventive and therapeutic oral and systemic healthcare.

### Inter-rater Reliability of Cheiloscopy Classification by Senior Dental Hygiene Students\*\*

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**Purpose:** Similar to fingerprints, patterned grooves and ridges on the lips are unique to each person and have the potential to aid in human identification. This study analyzed inter-rater reliability among senior

dental hygiene students tasked with classifying Cheiloscopy (human lip print) patterns to assess levels of agreement between participants.

**Methods:** Researchers of this human subjects IRB approved study recruited a convenience sample of 50 volunteers and collected their lip prints. Cosmetic lipstick was applied to the volunteers' lips, then cellophane tape was used to retrieve the prints which were transferred to white bond paper for viewing. Following lip print collection, senior dental hygiene students (N=43) were recruited by email and assigned to an experimental group (n=14) who received a 15-minute presentation on Cheiloscopy classification procedures and had practice classifying lip print samples, or the control group (n=13) who did not receive the presentation or practice. Then, all participants were provided the 50 lip print samples to visually analyze and categorize according to the gold standard Suzuki and Tsuchihashi Cheiloscopy classification system.

**Results:** Data collection is currently ongoing. Preliminary results indicated that the Kappa estimates for both groups suggest a fair level of agreement. The level of agreement was higher for the experimental group than the control group (37% vs. 22%), with a statistically significant difference (95% C.I. = (4.2%, 21.1%)).

**Conclusion:** These results suggest that training increases levels of agreement between lip print raters; however, more research is needed on cheiloscopy calibration due to low levels of agreement with or without training.

### **Educators' Perspectives on Manikin Use for Clinical Licensure Examinations\*\***

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**Purpose:** The use of manikin testing is new for the dental hygiene clinical board exam. There is currently a lack of research about the efficacy and accuracy of manikin testing for clinical licensure. The purpose of this study was to identify perceptions of dental hygiene educators regarding the use of manikins for the dental hygiene clinical licensure exam.

**Methods:** This qualitative study used an exploratory, online, focus group design with 20 dental hygiene educator participants recruited through purposive sampling. Two groups of educators were from institutions that did not use manikin testing during COVID-19, and two groups of educators were from institutions that did use manikin testing during the same time period. An interview guide was established for the groups and validated by focus group experts and pilot-testing procedures. Each focus group session was recorded and transcribed using Zoom. Themes were analyzed using the classic analysis strategy.

**Results:** Three major themes were identified regarding the use of manikin testing for clinical licensure exam: lack of knowledge, testing considerations, and perception of value of clinical licensure exams.

**Conclusion:** Although the manikin exam addressed ethical concerns, there were limitations in relation to assessing critical thinking and decision-making skills. Graduation from an accredited dental hygiene program was considered sufficient for licensure. Future studies should include comparisons of programs that graduate students without use of a clinical licensure examination versus those that continue to use clinical licensure examinations.

## Dental Advocacy for Individuals with Intellectual and Developmental Disabilities

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**Purpose:** Individuals with intellectual and developmental disabilities (IDD) have more negative healthcare experiences compared to the general population. The study's purpose is to enhance the educational preparation of dental health professionals by improving their understanding of health disparities of individuals with IDD by engaging them with a person with IDD who experienced inadequate interactions and exchanges with healthcare professionals during treatment.

**Methods:** An educational presentation was developed to improve knowledge regarding patients with IDD and was delivered to 129 third-year dental students. A pre-and post-presentation assessment was conducted to identify changes in knowledge, attitudes, and practices when working with individuals with IDD. Descriptive statistics and Welch's two-sample t-test were used to analyze the data.

**Results:** The response rate for the pre-and post-presentation survey was 77% and 29%, respectively. Respondents reported a mean increase in comfort (0-100) from 55.28 to 77.24 from the pre- to post-survey ( $p < 0.0001$ ). A significant increase in knowledge resulted ( $p = 0.005098$ ) when comparing the pre-presentation knowledge index (0.756) to the post-presentation knowledge index (0.837) using Welch's t-Test. After the presentation, 94% of respondents reported that they are more willing to treat patients with IDD.

**Conclusion:** An increase in knowledge, attitudes, and practices regarding oral care for patients with IDD occurred following an educational presentation, however, there was a disproportionate number of respondents participating in the pre-and post-presentation surveys. Positive exchanges occurred between the individual with IDD and the dental students during and after the interactive educational presentation.

## Identifying Barriers to Dental Care Among Hispanics in Southwest Minnesota

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**Purpose:** The purpose of this study was to assess the different barriers for dental health care among the Hispanic population in a rural, southwestern community in Minnesota.

**Methods:** An adaptation of the survey written by Vazquez and Swan (2003) was distributed to Hispanic individuals at an agricultural facility, religious organization, and early childhood organization. The findings for the research question were presented in the cross-sectional study utilizing descriptive statistics in the form of frequencies and percentages.

**Results:** Study results indicate that not having a dental provider of the same cultural background, having a language barrier, and not being able to afford their treatment were the most prevalent barriers to accessing dental care. The majority of participants did have dental insurance.

**Conclusion:** Future research is recommended to understand the association between an individual's willingness to spend money on dental services, dental insurance, and their attitudes toward oral health. Additionally, further studies regarding the influence of community oral health workers in the dental health care system will help understand how to best address cultural and linguistic barriers.

## Work-related Musculoskeletal Disorders and Chairside Stretching Behavior Among Dental Hygienists

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**Purpose:** Work-related musculoskeletal disorders (WMSDs) among dental hygienists (DHs) are highly prevalent due to occupational risk factors. The purpose of this study was to evaluate prevalence of WMSDs in clinical DHs, chairside stretching exercise behavior, and readiness to implement chairside stretching exercises.

**Methods:** Cross-sectional survey research was conducted with a non-probability sample of clinical DHs (N = 224). The survey included WMSD experience, chairside stretching exercise behavior, and University of Rhode Island Change Assessment – Exercise 2 (URICA-E2) to assess participants stretching exercise behavior and related stage of change. Analysis included descriptive, t-tests, Spearman correlation, chi-square tests, confirmatory factor analysis, and regression modeling.

**Results:** The findings showed 83% of participants reported WMSDs with a mean stretching frequency of 4.6 (SD=4.2) times per day for 2.2 (SD=2.9) minutes. In regression models, predictors of duration ( $p < .05$ ) and frequency ( $p < .01$ ) of stretching was being in the Action stage of change and being in Contemplation was negatively associated with duration ( $p < .01$ ) and frequency ( $p < .01$ ). The models explained 7% ( $R^2 = .07$ ,  $p < .01$ ) of variance in duration and 17% ( $R^2 = .17$ ,  $p < .01$ ) of variance in frequency.

**Conclusion:** Findings showed a high prevalence of WMSDs with the contemplation stage being the strongest predictor for duration and frequency of stretching

behavior. However, variables included in this study only accounted for 7-17% of the variance suggesting a need to explore other factors that explain duration and frequency of DHs chairside stretching behavior.

## Self-awareness: Leadership practice for the dental hygiene student

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**Purpose:** An evolving healthcare system requires a well-prepared and diverse oral health workforce. Research indicates leadership development (LD) enhances professional attributes and fosters team collaboration. The Commission on Dental Accreditation (CODA) recognizes the importance of institutional leadership practices. However, little is known about LD in dental hygiene (DH) education. This pilot study aimed to evaluate self-reported leadership behavior in self-awareness and confidence following an LD seminar.

**Methods:** This study used a convergent mixed-methods design. All senior DH students (n=24) from one Southern University participated in a half-day LD seminar. Learners were asked to complete pre- and post-programmatic surveys with Likert-scale items to measure self-awareness and leadership behaviors and open-ended questions exploring leadership perspectives. A DiSC personality assessment evaluated personal traits, followed by a hands-on interactive LD seminar. Descriptive statistics analyzed Likert responses, and an inductive coding process identified emergent themes. The Office of Human Research Ethics reviewed the study and determined it was exempt.

**Results:** Of the 24 DH students, 91.7% (n=22) completed the survey. Open-ended responses

supported perceptions regarding LD being essential to their curriculum and profession. Findings revealed that 100% (n=22) of participants felt the workshop helped them assess their professional values and increased self-awareness. Ninety-one percent (n=20) felt the workshop helped identify leadership capabilities. Results revealed learner confidence increased in defining leadership self-awareness (p=0.0074).

**Conclusion:** The participants recognized the importance of LD and found it applicable to their professional development. This study provides insight into designing effective LD programs to foster leadership skills and collaboration among teams.

### Dental Hygienists' Knowledge and Perception of Eco-dental Products

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**Purpose:** The population has become aware of the environmental impact of single-use plastics. The dental industry has limited implementation of sustainable products due to lack of evidence-based resources. The purpose of this study was to determine gap in knowledge and perceptions of dental hygienists and students on eco-dental products.

**Methods:** A 12-question mixed-methods questionnaire was distributed online using convenience sample (n= 27). Items assessed were perceptions and knowledge of eco-dental products using a five-point Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree). Participants were asked open-ended questions regarding perceptions. Participants were asked to watch a YouTube Website tutorial, then visit a self-designed eco-dental products website

Data was statistically analyzed using a t-test and chi-square.

**Results:** Perceptions of participants indicated no statistically significant changes. Of respondents,

51.85% indicated need for increased education and resources on eco-dental products. Study results indicated 59.26% dental hygiene professionals and students perceive eco-dental products as beneficial. Association between educational level and likelihood of recommending eco-dental products indicated those with a bachelor's, associate degrees, and student status are more likely to recommend eco-dental products than those with a MSDH degree or higher.

**Conclusion:** Results suggest improved research and education on efficacy of eco-dental products would increase product recommendations. Future research with larger sample size would provide greater insight into dental hygienists and students' knowledge and perceptions of eco-dental products. This study highlighted need for research, continuing education, technologies, and resources available to dental hygienists regarding eco-dental products.

### Predictors of Burnout or Intention to Leave the Field of Dental Hygiene

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**Purpose:** Dental hygiene is a demanding profession requiring physical and mental work in a clinical setting. Because of the demands of the professional role, dental hygienists are susceptible to burnout. The purpose of this study was to determine the predictors of burnout in dental hygienists and their intention to leave the profession.

**Methods:** This was a quantitative cross-sectional study. The study instrument consisted of The Maslach Burnout Inventory-Health Services Survey distributed to dental hygienists via social media platforms.

**Results:** Responses from 131 dental hygienists were used. Mean scores for emotional exhaustion showed there was a significant relationship between intention on leaving the dental hygiene profession in the next five years and emotional exhaustion ( $p=0.0001$ ). There was a significant difference in emotional exhaustion between those who intend to leave the profession and those who do not ( $p < 0.0001$ ) and between subjects that maybe want to leave the profession ( $p = 0.006$ ).

**Conclusion:** Dental hygienists who responded to this survey are experiencing moderate burnout in the categories of emotional exhaustion and depersonalization. Personal accomplishment showed lower levels of burnout. The main predictors of burnout are linked to if the dental hygienist is intending to leave in the next five years, hours worked, and patients that are seen per day.

colonizer bacteria bind to saliva proteins that coat our teeth, 2) secondary colonizer bacteria bind to primary colonizers, 3) pathogenic tertiary colonizers bind to secondary colonizers. Third stage colonizers continue to advance the gingivitis and periodontitis by allowing the growth of virulent pathogenic species known to cause periodontal disease. *Fusobacterium nucleatum*, a secondary colonizer, is a target for our research.

The Oral Health in America report for 2021 describes how more research, innovation, and policies focused on improving oral health is needed. Our research uses the antimicrobial properties of iron oxide nanoparticles to help prevent biofilm formation. The research will undergo three stages to reach a goal of creating iron oxide nanoparticles that work effectively by killing bacteria when placed in oral hygiene products.

### **Nanotechnology for the Prevention of Oral Disease**

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**Abstract:** According to the Centers for Disease Control, half of Americans over the age of 30 show signs of periodontal disease. Gingivitis results from the accumulation of dental plaque biofilm along the gingival margins and the immune system's inflammatory response to the bacteria in plaque. When oral hygiene is chronically neglected, the inflammatory infection progresses, which can result in irreversible periodontal disease and eventual loss of teeth and bone. Bacteria on any surface is acquired through the successive accumulation of microorganisms with colonization. Dental plaque matures in three stages: 1) primary