

# 2021 Dentsply Sirona/ADHA Graduate Student Research Abstracts

The following abstracts are from the participants of the Annual Dentsply Sirona/ADHA Graduate Student Clinician's Research Program. The purpose of the program, generously supported by Dentsply Sirona for the past 14 years, is to promote 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

\* Indicates first author

## Periodontitis Susceptibility in Patients with WHIM syndrome\*\*

\*Laurie Brenchley, RDH, PHDH, MS

JoAnn Gurenlian, RDH, MS, PhD, AFAAO

Leciel Bono, RDH, MS

Lakmali M. Silva, PhD

Teresa Greenwell- Wild, MS

Drake Williams, DDS, PhD

Pamela J. Gardner, DMD

Niki M. Moutsopoulos, DDS, PhD

Idaho State University

Pocatello, ID, USA

\*\*1<sup>st</sup> place award

**Purpose:** Studies in patients with single gene mutations reveal the role of specific genes and pathways in human health and disease. In this sense, studies in patients with genetic defects leading to periodontitis become important toward the understanding of genetic factors linked to periodontitis susceptibility. WHIM syndrome (Warts, Hypogammaglobulinemia, Infections, and Myelokathexis syndrome) is an autosomal dominant syndrome caused by gain of function (GOF) mutations in the chemokine receptor CXCR4. While severe periodontitis in early life has been reported in multiple cases of WHIM syndrome, a comprehensive characterization of periodontal clinical status has not been performed in a large WHIM cohort to date. Furthermore, mechanisms underlying periodontitis susceptibility in WHIM syndrome are not fully delineated. The purpose of this study was to characterize the extent of periodontal pathogenesis in patients with WHIM Syndrome immune dysfunction compared to age-gender matched healthy controls through clinical parameters.

**Methods:** A cohort of WHIM patients (n=23) and age matched healthy volunteers (n=23) were clinically evaluated at the NIH hospital. Clinical parameters included probing

depth, clinical attachment loss, bleeding upon probing, and missing teeth as well as radiographic evidence of bone loss.

**Results:** Patients with WHIM syndrome present with increased susceptibility to periodontitis. Thirty percent of WHIM patients presented with severe disease. WHIM patients had significantly increased mean probing depths  $p < 0.0001$ , clinical attachment loss  $p < 0.0001$ , percentage of sites bleeding on probing  $p = 0.0009$  and number of missing teeth  $3.65 + 4.6$  compared to age/gender matched healthy volunteers  $1.7 + 1.58$ .

**Conclusions:** GOF mutations in CXCR4 lead to periodontitis susceptibility. Further studies are exploring mechanisms underlying this phenotype.

## Predictors of Empathy Among Dental Hygiene Undergraduate Students\*\*

\*David Collins, RDH, MDH

Rachel Kearney, RDH, MS

Joen Iannucci, DDS, MS

Janice Townsend, DDS, MS

The Ohio State University

Columbus, OH, USA

\*\*2<sup>nd</sup> place award

**Purpose:** Empathetic engagement is thought by many medical and psychological researchers to be a vital ingredient in forming respect-based relationships between patient and clinician, ultimately leading to more optimal patient care. The purpose of this study was to examine the correlations between demographics such as age, year in school and type of institution on levels of empathy in entry-level dental hygiene students.

**Methods:** This cross-sectional observation study was conducted among dental hygiene undergraduate students attending The Ohio State University, Columbus State Community College, and Owens Community College. All 41 participants completed the 20-item Jefferson Scale of Physician Empathy®.

student version (JSE-S) along with demographic questions including age, gender, year in school, and the type of degree being sought—associate versus baccalaureate. Descriptive statistics were used to analyze the data. Group comparisons of the empathy scores were conducted using t-test and one-way analysis of variance ( $p < 0.05$ ). Regression statistics were conducted to see if the students' year in school and the type of degree being sought were predictors of empathy.

**Results:** Among the 41 participants, most scored between 83 and 89 for a total empathy score. Possible scores range between 20 (very low empathy) to 120 (very high empathy). The highest level of empathy was scored at 96; however, the mode was noted as 83. There was no statistically significant difference between levels of empathy of first- and second-year students, and those attending a two-year institution versus a four-year university. Age was not recognized as a predictor of empathy. Of the 41 participants, there were a total of 37 female participants, two male participants, and two who preferred not to disclose their gender identity. Gender was not considered as only 0.7% of the participants identified as male.

**Conclusion:** The present study does not show correlations or predictions of empathy within dental hygiene students' demographics. Future research should involve a less homogenous cohort and expand beyond a small convenience sample and include a longitudinal gauge to assess potential fluctuations in empathy as students progress throughout their clinical rotations.

### Implementing Environmental Sustainability Educational Intervention in Dental Hygiene Education\*\*

\*Wai-Sum Leung, MS, RDH

Elizabeth Kornegay, MS, CDA, RDH

Tiffany White, MEd, CDA

Lindsay Dobs, PhD

University of North Carolina, Adams School of Dentistry  
Chapel Hill, NC, USA

\*\*3<sup>rd</sup> place award

**Purpose:** As the healthcare industry contributes to a large portion of national waste output, steps should be taken to minimize dentistry's contribution to waste and improve public health outcomes. The purpose of this study was to implement an educational intervention and assess its usefulness on improving dental hygiene (DH) students' perceptions and knowledge on environmentally sustainable dentistry (ESD).

**Methods:** A convenience sample of thirty-five second-year DH students at the University of North Carolina at Chapel Hill (UNC-CH) Adams School of Dentistry (ASoD) were recruited for this quasi-experimental non-randomized observational mixed-methods pilot study. The study intervention, an online educational module titled "Environmental Sustainability and Dentistry," was created and incorporated the 2nd year DH course "Clinical Dental Hygiene." Students filled out pre- and post-surveys immediately before and after completing the module. Surveys utilized Likert-scale and multiple-choice questions that ranged from self-reported level of knowledge & attitude on climate change and environmental sustainability to objective knowledge-based questions. Pre- and post-module survey scores were compared with paired t-tests. Three weeks after module completion, students were assigned a follow-up assignment and post-assignment survey to get feedback on the assignment. Univariate and qualitative analyses were conducted on the post-assignment component.

**Results:** Twenty-four students completed the pre- and post-module survey (Response Rate: 68.57%). Twenty-two participated in the post-assignment survey component (RR: 62.86%). There was a statistically significant ( $p < 0.0001$ ) positive difference between pre-survey and post-survey ESD knowledge scores following the educational module intervention. There was also a statistically significant ( $p < 0.0001$ ) positive difference between pre-survey and post-survey ESD attitude scores after module completion. Majority of responses (>90%) indicated that the follow-up assignment strengthened their ESD learning experience. Qualitative analysis revealed that the reflective assignment helped students apply module concepts in the real world and adopt behavioral changes to be less wasteful in clinic.

**Conclusion:** Findings from this study support instructional interventions on ESD in DH education may improve student's knowledge of ESD and encourage behavioral changes to be more waste conscious.

## The Need for Cannabis Education in Dental Hygiene Programs

\*Jennifer L. Joffray, MSDH, RDH, CDA, COA

Deborah L. Johnson, MS, RDH-EP

Fones School of Dental Hygiene

University of Bridgeport, Bridgeport, CT

**Purpose:** Cannabis and the endocannabinoid system are rarely included in the education and training programs for health care providers. Patients are not aware of the risks associated with using cannabis and healthcare professionals should be well prepared to assess, educate, and treat patients who use cannabis. The purpose of the study was to assess the cannabis content within dental hygiene education programs.

**Methods:** An online survey was distributed to 327 dental hygiene program directors and respondents were asked to answer all 26 questions.

**Results:** With a 21% response rate and 100% completion rate, 60% of respondents responded cannabis content is provided within their dental hygiene program, 38% responded “no”, and one responded, “I do not know”. No significant difference existed whether cannabis is legal in the state for medical or recreational use and cannabis content either included or excluded from the dental hygiene curriculum.

**Conclusion:** The results indicated the need for cannabis to be included in dental hygiene education programs including didactic content and patient assessment. Further research is needed to identify standardized educational content and the endocannabinoid system for educators to instruct students. In addition to patient assessments, standardized recommendations to assist patients in alleviating adverse oral health effects is also important.

## Relationship Between Original Research Experiences and Evidence-based Practice Among Undergraduate Dental Hygiene Students

\*Brian B. Partido, PhD, MSDH, RDH, CDA

Anna Lint, PhD

Carey Ford, PhD

Michael Wesolek, PhD

Dental Programs, Seattle Central College

Seattle, WA, USA

**Purpose:** Engaging undergraduate dental hygiene students in research experiences may foster interest and overcome barriers to graduate education and may improve the implementation of evidence-based practice. The purpose of this study was to explore the relationships between original research experiences and evidence-based practice among undergraduate dental hygiene students.

**Methods:** Upon IRB approval (TUI#1209), this study utilized a quantitative survey method. The target population included a non-probability sample of undergraduate dental hygiene students in the last year of their entry-level dental hygiene programs. The research spider instrument measured original research experience and the KACE instrument measured evidence-based knowledge, attitudes, access, and confidence in implementing evidence-based practice. Survey invitations and two e-mail reminders were sent to program directors of US dental hygiene programs to forward to dental hygiene students in their final year. The data were analyzed using descriptive statistics, bivariate analysis, and linear regression.

**Results:** Preliminary data was received from 128 respondents. The level of research experience was  $M=27.63$  ( $SD=7.88$ ) and the level of evidence-based practice was  $M=92.80$  ( $SD=15.04$ ). Research experience was significantly correlated with evidence-based attitudes, access, and confidence ( $p<.01$ ). Research experience was found to be a significant predictor of evidence-based practice ( $p<.001$ ).

**Conclusion:** The level of research experiences impacted the level of evidence-based practice among undergraduate dental hygiene students. Incorporating original research experiences into the dental hygiene curriculum may improve the implementation of evidence-based practice.

### **Oral Care for the Pregnant Patient: An educational intervention**

\*Holly Redwine, RDH, MSDH

Sarah Jackson, RDH, MSDH

Ann O'Kelly Wetmore, RDH, MSDH

Lucretia A. Berg EdD, MSOT, OTR/L

Eastern Washington University

Spokane, WA, USA

### **Registered Dental Hygienists' Perceived Preparedness on Treating Patients with Special Health Care Needs**

\*Kayla M. Reed, RDH, MS-EDHP

Lisa F. Mallonee, RDH, MPH, RD, LD

Kathleen B. Muzzin, RDH, MS

Patricia R. Campbell, RDH, MS

Peter H. Buschang, PhD

Texas A&M College of Dentistry

Dallas, TX, USA

**Purpose:** Interprofessional collaboration can help prevent adverse pregnancy outcomes related to poor oral health. This study examined if an educational module provided by a dental hygienist (DH) could increase the knowledge and confidence of physician assistant (PA) students with preventive oral care for the pregnant patient.

**Methods:** A one-group mixed-method approach was utilized in this research study. Pregnancy and oral health knowledge were assessed using a 9-item pre-test and posttest survey. Participants completed the pretest, were presented an educational module, and were asked to complete an immediate post-test. A second post-test was sent via e-mail to the participants three weeks after the educational module concluded. Pre-test and first posttest answers were compared for statistical significance. The first posttest and second post-test were compared for participants' knowledge retention.

**Results:** A total of (N=54) first year PA students were included in this study. The mean posttest score was statistically significantly higher than the mean pre-test score ( $p < 0.001$ ). The results from the pretest and first post-test demonstrated a statistically significant increase in knowledge and confidence. There was also a slight increase from 4.16 (SD= 0.51) to 4.22 (SD=0.47) in mean scores from the first post-test to the second post-test indicating knowledge retention.

**Conclusion:** A pregnancy and oral health care educational module is an effective method to increase knowledge and confidence for PA students. Interprofessional educational experiences and interprofessional collaboration may decrease oral health disparities for women of child-bearing age which could help reach the Healthy People 2030 goal for increasing access to dental care including preventative services.

**Purpose:** Current census data shows a growth in the special needs population and dental hygienists may not be adequately prepared to treat this population. The purpose of this study was to examine dental hygienists' perceived preparedness when treating the patients with special health care needs (SHCN) and how it relates to their dental hygiene (DH) education.

**Methods:** Paper surveys were mailed to a random sample of 1,036 licensed dental hygienists in Alabama, Florida, Tennessee and Texas.

**Results:** A total of 181 surveys were returned, for a response rate of 17.5%. Approximately 69% of respondents indicated that they felt their education only somewhat prepared them or did not prepare them to treat patients with SHCN. Respondents indicated that their clinical training on patients with SHCN was more beneficial than didactic course content in improving their confidence and comfort for working with this population. Results of this study also indicated a significant relationship ( $p=0.003$ ) between the time spent on the subject of patients with SHCN during DH education and the participant's perception of how well their DH education prepared them.

**Conclusion:** Results suggest that dental hygienists agreed there should be more education on the patients with SHCN. Inclusion of a mandatory, annual continuing education course on the patients with SHCN may be beneficial for all dental hygienists. The addition of such a requirement may increase dental hygienist's comfort level and in turn, increase their willingness to treat patients with SHCN in their dental practice.



## Associations Between Oral Health Literacy and Periodontal Health: A pilot study

\*Alyssa Olson, RDH, MSDH

Yvette G. Reibel EdD, RDH

Karl D. Self, DDS, MBA

Bruce Lindgren, PhD

Christine M. Blue, DHSc, RDH

Priscilla M. Flynn, DrPH, MPH, RDH

University of Minnesota

Minneapolis, MN, USA

**Purpose:** Growing evidence associates low oral health literacy (OHL) with poor oral health outcomes. While nearly half of United States adults have periodontal disease (PD), conflicting results of the association between OHL and PD require research using the most current and appropriate research measures. The purpose of this pilot study was to identify the association between functional OHL and periodontal health as defined by the American Academy of Periodontology (AAP) classification system.

**Methods:** A cross-sectional study was conducted with dental patients presenting for dental hygiene care at a Midwestern Federally Qualified Health Center. Functional OHL was measured using the Oral Health Literacy Adults Questionnaire (OHL-AQ). Periodontal health was measured clinically and categorized by stage and grade. Additional demographic factors and health history information related to periodontal health were collected. Descriptive analysis reported the median and range for ordered variables, and frequency and percentages for categorical variables. Wilcoxon rank sum test, Kruskal-Wallis test, and Spearman correlation coefficients were used to find association between OHL and periodontal health.

**Results:** Statistically significant associations were found between OHL-AQ scores and AAP staging and grading categories. Smokers were associated with more advanced periodontal disease stages and grades. Periodontal disease stage increased with age, and periodontal disease grades progressed among diabetics. No associations were found between periodontal health and sex, race, ethnicity, education, insurance, or country of origin.

**Conclusion:** Functional oral health literacy had a significant inverse relationship with both AAP periodontal disease staging and grading. A larger study is needed to confirm the findings of this pilot study.

## Prevalence and Predictors of Workplace Bullying Towards the Dental Hygienist

\*Jacqueline N. Petit, RDH, MS

Linda D. Boyd, RDH, RD, EdD

Jared Vineyard, PhD

Christine Dominick, RDH, MEd

MCPHS University, Forsyth School of Dental Hygiene  
Boston, MA, USA

**Purpose:** Research indicates there is a positive correlation between burnout, withdrawal, and absenteeism among healthcare workers who have experienced workplace bullying (WPB). The purpose of this study was to investigate the prevalence of WPB among dental hygienists, and identify predictor/catalysts to WPB.

**Methods:** Cross-sectional survey research was used with a convenience sample of dental hygienists (n=943) providing patient care to explore WPB. The survey was shared via social media on Facebook and Instagram group pages, specifically dental focused. The validated Negative Acts Questionnaire-Revised (NAQ-R) was used to measure exposure of WPB using descriptive, correlation, chi-square, and Mann-Whitney U.

**Results:** The completion rate was 81% (n=765). Results showed 21% of participants had experienced WPB now and then, 9.4% several times a week, and 2.9% almost daily. Predictors for WPB included highest degree earned ( $p=-0.03$ ), US (United States) region of residence ( $p=0.001$ ), clinical setting (private practice versus dental service organization) ( $p<0.001$ ), clinical years of experience ( $p=0.002$ ), and work status (full- or part-time) ( $p=0.02$ ).

**Conclusions:** The findings confirm WPB has been experienced by 1 in 5 clinical dental hygienists. Workplace bullying is not a new phenomenon, but given the prevalence observed in dental hygiene participants, employers need to be active in preventing and managing bullying to create and maintain an effective dental team and positive work environment.

## Attitudes of Virginia Dental Hygienists Toward Dental Therapists

\*Helene Burns, RDH, MSDH

Susan L. Tolle, RDH, MS

Emily A. Ludwig, RDH, MS

Jessica R. Suedbeck, RDH, MS

Old Dominion University

Norfolk, VA, USA

**Purpose:** The purpose of this study was to determine opinions and attitudes of Virginia dental hygienists toward dental therapists (DTs) and determine if current education level and years of practice affected opinions regarding education requirements for DTs.

**Methods:** After IRB approval, a 22-item questionnaire was distributed online to a convenience sample of 910 Virginia dental hygienists. Questions assessed attitudes toward DTs using a seven-point Likert-type scale ranging from 1 (strongly disagree) to 7 (strongly agree). Further questions assessed demographics and open-ended responses regarding potential advantages and/or disadvantages of DTs. Independent samples t-tests and chi-square analyses were used to analyze results.

**Results:** A response rate of 22% was obtained (n=200). Most respondents agreed DTs were needed in Virginia (M=5.78,  $p<0.001$ ) and supported DTs as a solution to access to care issues in Virginia (M=5.97,  $p<0.001$ ). While most agreed it was important for Virginia to adopt dental therapy legislation (M=5.89,  $p<0.001$ ), most disagreed DTs should be restricted to underserved areas (M=3.19,  $p<0.001$ ). No significant association was found between years of practice and opinions toward education requirements for DTs; however, a significant association was found between current education level and opinions toward education requirements for DTs (Fisher's Exact Test=34.17,  $df=9$ ,  $p=.000$ , Cramer's  $V=.28$ ).

**Conclusion:** Results revealed Virginia dental hygienists had positive attitudes toward DTs. A larger sample could provide more insight into opinions of the Virginia dental hygienist population.

## Dental and Dental Hygiene Students' Practice Behavior in SBIRT (Screening, Brief Intervention and Referral to Treatment)

\*Lori Carlson, RDH, MS

Kimberly Bray, RDH, MS

Tanya Villalpando Mitchell, RDH, MS

Julie Sutton, RDH, MS

JoAnna M. Scott, PhD

University of Missouri-Kansas City School of Dentistry  
Kansas City, MO, USA

**Purpose:** Substance misuses are challenging for the public health system and society in general. Oral health care providers can identify alcohol and substance misuse via SBIRT screening. The purpose of this study was to examine the alcohol and substance abuse screening practices of dental and dental hygiene students who had received SBIRT training.

**Methods:** A retrospective chart audit of patient records at a dental school clinic was performed to evaluate SBIRT practices. Data from SBIRT tools (Oregon Prescreen, AUDIT, DAST assessment) were collected between September 2017 to February 2020. Percentages of prompted and completed assessments and student type (dental vs. dental hygiene) were calculated. Chi-square or Fisher's Exact test were used to evaluate differences by student type.

**Results:** 451 records (51%) prompted a prescreen assessment, 123 (31.8%) an AUDIT assessment and 35 (9.0%) a DAST. Patient risk categories for the AUDIT: 83 (72.8%) low risk, 26 (22.8%) risky, 3 (2.6%) harmful, and 2 (1.8%) severe. Risk categories for the DAST: 13 (41.9%) low risk, 15 (48.4%) risky, 2 (6.5%) harmful, 1 (3.2%) severe. Completed prescreens by student type were 83% dental, 86% dental hygiene, 100% dental, 93% DH of AUDITS, 100% dental, 88% DH of DASTs. No significant differences were found between student type for completion rate.

**Conclusion:** Completion rates were high for students who received SBIRT training regardless of student type.

## Assessing the Nurse Practitioners' Knowledge and Clinical Practice Regarding the Oral-systemic Link

\*Angela Haynes, BSDH, MSAH

Deborah Dotson, RDH, PhD

Randy Byington, EdD

Ester Verhovsek-Hughes, EdD

East Tennessee State University

Johnson City, TN, USA

**Conclusion:** Results indicate gaps in NP knowledge and confidence in oral health assessments. Education provided by oral health care providers could increase NPs knowledge and confidence in performing oral assessments as part of primary care and lead to early identification of oral-linked diseases and improved outcomes. Dental hygienists are well positioned to help fill in the gaps in the oral health education of nurse practitioners.

**Purpose:** Nurse practitioners (NPs) comprise a significant portion of the primary care workforce and play an essential role in patients' health awareness, prevention strategies, disease management, and provider referrals as needed. Nurse practitioners receive education on the oral-systemic connection; however, it is unknown whether the oral cavity is assessed as part of patient encounters. The purpose of this study was to explore the knowledge and practice habits of NPs in assessing the oral cavity and whether oral health care providers were utilized to deliver oral health education to NPs.

**Methods:** A survey was developed, pilot tested, and e-mailed to a convenience sample of 148 NPs in primary care facilities in West Tennessee. The survey was divided into the following domains: oral health educational background; oral-systemic knowledge and perceptions; confidence in knowledge and ability to evaluate the oral cavity; oral health assessment practices; oral health promotion practices; and oral care referrals. Data were analyzed using descriptive statistics.

**Results:** A total of 66 NPs participated in the study for a response rate of 45%. Respondents were primarily female (91%), aged 31 to 40 years (41%), with master's degrees (77%). Over half worked in primary care (56.1%) with the majority holding a primary care certification (81.8%). Most participants self-reported their oral-systemic knowledge as fair (58%), and less than one-third (30.3%) were confident in their knowledge and ability to evaluate oral abnormalities. Knowledge and confidence were significantly associated with assessing the oral cavity in new patients ( $p=0.002$ ) and existing patient exams ( $p = 0.037$ ). Fewer than 8% reported "almost always" regarding oral health promotion and over half (51.8%) reported being "almost always" comfortable making oral health referrals. None of the respondents reported having received any oral health education from dentists or dental hygienists.