

Perceptions, Motivations, and Barriers of Dental Hygienists on
Pursing Bachelor Programs

Thesis

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Abstract

Objective: For many years, the American Dental Hygienists' Association (ADHA) has advocated for a Bachelor of Science in Dental Hygiene to be established as the entry-level degree, yet the dental hygiene profession has lagged behind other allied health professions, such as nursing and physical therapy, where higher educational standards have been widely embraced and implemented. The purpose of this study was to investigate the perceptions, motivations, and barriers faced by dental hygienists pursuing bachelor degrees in dental hygiene (BSDH). **Methods:** Utilizing an electronic cross-sectional survey, a modified questionnaire was sent to dental hygiene program directors for dental hygiene students and posted on social media sites for dental hygienists. **Results:** A total of 442 participants including 244 registered dental hygienists and 198 dental hygiene students. Findings reveal a consensus among respondents on the importance of bachelor's degree education, with 73% of dental hygienists and 87.4% of dental hygiene students acknowledging its relevance. Motivational factors driving the pursuit of a BSDH included aspirations for leadership, educational roles, and enhanced professional knowledge. Barriers included inflexible work schedules, family obligations, and financial constraints. Regression analysis identified gender differences in the perceived importance of bachelor's degrees, with male respondents perceiving a bachelor's degree as more important. **Conclusion:** This study found that dental hygienists

with associate degrees and associate degree dental hygiene students value the BSDH. Leadership, educational roles, and enhanced professional knowledge were the motivators for pursuing a bachelor degree. Inflexible schedules, family obligations, and financial constraints were the barriers to pursuing the degree. This research underscores the imperative need for systemic changes to alleviate barriers and enhance accessibility to higher education, including awareness of financial aid for these programs, thereby ensuring the continued growth and efficacy of the dental hygiene profession.

Dedication

This document is dedicated to the love of my life, my best friend, and my greatest supporter- my husband, Saurabh. I could not have completed my research without the unwavering encouragement and support. You gave me the courage and enthusiasm to persevere when I felt overwhelmed and doubted myself. Your kindness and dedication to our family have not gone unnoticed, as you took on the roles as our sole financial supporter and the primary caregiver to our two beautiful toddlers. I will forever be grateful for the sacrifices you made to help me pursue my dreams. I love you with all my heart.

To my children, Prem and Poppy, I hope one day you will look back at this time and realize with hard work and dedication, you can achieve all your educational goals without sacrificing the joys of family and life. I love you to the moon and back.

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Chapter 1. Review of Literature

Most dental hygienists begin their career by first obtaining an Associate Degree of Applied Science of Dental Hygiene.¹ This is a two- year entry degree that is typically offered at a community college. The American Dental Hygienists' Association (ADHA) conducted a study in 2007 concluding that 60.6% of practicing dental hygienists held an associate degree as their highest level of education.² There is minimal research that has been conducted regarding why dental hygienists who have already obtained an associate degree would choose to pursue a bachelor degree program,³ yet attaining a bachelor's degree has been cited as beneficial as the profession moves towards improving access to oral healthcare and improving community health.⁴ The US Department of Health and Human Services (DHHS) lists that by increasing both prevention methods of dental disease along with increasing community access to dental care, overall health can be improved.⁵ In order to meet the health needs of the public, dental hygienists will need a more comprehensive education in public health delivery systems. Literature and accreditation standards show that the standard curriculum offered with an associate degree program in dental hygiene does not provide public health related courses that are comprehensive or thorough as most bachelor and master degree programs.⁵ Dental hygienists who have obtained bachelor degree will be more likely to tread forward and

continue their education by enrolling in master degree programs.⁴ This will be crucial as the dental hygiene profession continues to grow and advance. Further research is warranted to explore deeper into dental hygiene education and professional advancement. This research focused on the perceptions, motivations, and barriers of dental hygienists with an associate degree related to pursuing a bachelor's degree. The results of this study can contribute to the design and planning of bachelor's degrees and inform educators about the reasons why hygienists choose to or not to pursue an advanced degree. These advancements can lead to potential solutions to reduce barriers in the dental field. The purpose of this review is to provide knowledge on the history and present evolution of dental hygiene education, and to explore the current research on the perceptions, motivations, and barriers of dental hygienists pursuing bachelor's degree programs.

Dental Hygiene Education History and Evolution

Dental hygiene has been around for over 100 years, dating back to the early 1900's. In 1906, the idea of a dental hygienist began in Bridgeport, Connecticut. It was developed by Dr. Alfred C. Fones, who is now known as "the father of dentistry." Dr. Fones recognized the importance of preventive hygiene and prophylactic treatments. He quickly realized it was no longer feasible to carry out preventative treatments without auxiliary staff.⁶ He trained his office assistant, Irene Newman, to demonstrate preventative oral hygiene care to his patients. Her role then expanded to include clinical duties. In 1913, Dr. Fones started the first dental hygiene program, consisting of a one-year curriculum, and celebrated the first graduating class in 1914. Dental hygienists first started the profession working in school-based programs and hospital settings. Dr. Fones believed that women were preferred for this role due to societal conception that women

were more cooperative and caring with children and more suited for fine detailed tasks.⁴ Newman continued working with Dr. Fones through the years, and in 1917, she became the first licensed dental hygienist in the country.⁶ By 1951 all states had licensure available for dental hygienists⁷. The American Dental Hygienists' Association (ADHA), which was established in 1917, contributed to the educational guidelines for dental hygienists 10 years later by recommending changing the 1-year program to a 2- year course of study for a dental hygiene license.^{8,9} By 1935, a high school diploma was required, and in 1940 a 2-year degree was mandated for licensure.⁶ The curriculum offered in 1945 included credits in general education (Economics, Psychology), core science courses (Anatomy and Physiology, Bacteriology, and Biochemistry), dental specific science courses (Dental Anatomy, Pathology, Dental Histology), dental hygiene clinics, and various dental hygiene specific courses ¹⁰. The American Dental Association (ADA) and the Council of Dental Education began accreditation in the late 1940's and determined that all academic programs would be two years in length (at minimum).^{2,10} In 1975, the Commission on Dental Accreditation (CODA) was formed and is the current accrediting body for entry level dental hygiene programs.¹⁰ According to the CODA standards for dental hygiene education the current curriculum must include content in the following four areas: general education biomedical sciences, dental sciences, and dental hygiene sciences.¹¹

Eight decades after the first dental hygienist was educated, studies have shown that dental hygiene has grown significantly. An associate degree currently has more general education courses compared to the curriculum in 1945; in addition to previously

discussed curriculum today's program of study also includes courses in English, Math, and Sociology. The science requirements have expanded adding more specified anatomy, embryology and histology courses.¹⁰ The typical associate degree program offers an average of 2,941 total clock hours and a bachelor program offers an average of 3,299 hours of instruction.¹ The small difference in number of hours has sparked the debate and discussion around a bachelor's degree becoming the entry level degree for dental hygiene.^{10,12}

Dental hygiene education consists of associate, bachelor, and master degree programs. There are currently over 332 entry level degree programs, the overwhelming majority (277) being associate programs.¹³ Some dental hygienists choose an associate degree program initially, then continue to do a "completion" program and earn a bachelor's degree in dental hygiene.¹⁴ Completion programs consist of the remaining credits needed to earn a bachelor degree in dental hygiene and typically includes courses in periodontics, educational methodology, community, and research.^{4,15} Most of these programs are fully online or hybrid (in person and online).¹⁶ A master's degree in dental hygiene is currently the highest degree awarded in the profession.¹⁷ There are twenty-two master's degree programs in the United States that align with a path in dental hygiene. Seventeen of these programs offer a master in dental hygiene (MSDH) and the remaining five include a Master of Science (MS), Master of Science in Human Services, Master of Health Science, and Master of Science: Oral Health Care.⁴

One of the arguments for bachelor's degrees as entry level is that associate degree dental hygiene programs have similar credit hour requirements.¹⁰ Most students take three to

four years to complete an associate's degree in dental hygiene^{1,2}. Several authors raise concerns about whether a bachelor's degree should serve as the standard for entry-level education in the dental hygiene profession.^{10,16} The ADHA has been advocating for bachelor degree programs to be the entry level degree for decades.^{4,16} A pilot study by O'Hehir in 2018 investigated whether an associate degree appropriately matches the current requirements of dental hygiene education. O' Hehir's research reveals that most dental hygienists complete four or five years of college to receive only an associate degree. Few students earn a bachelor's degree even though they are only sixteen academic hours and two clinic hours short of the higher degree.¹⁰ Further research is necessary as O'Hehir's study only reviewed two dental hygiene programs. Previous literature raises concerns about the number of hours students complete for an associate degree in dental hygiene and argue that it is oftentimes closer to the number of hours required for a bachelor's degree.^{2,10,12}

It is important to recognize that the associate degree primarily focuses on preparing clinicians for initial licensure, providing the foundational clinical skills necessary to enter the workforce. This clear delineation underscores the argument that completion programs not only build on this foundation but also offer dental hygienists the extra educational credits needed to leverage expansion into diverse career opportunities. Coursework done in a bachelor's completion program could give dental hygienists opportunities to branch into a career outside of the traditional clinical realm.^{14,15,18,19} Completion programs are available in the United States (U.S.) and in Canada. In the U.S. dental hygienists can complete a bachelor's degree in approximately two years (after they

have obtained their associate degree). Historically, degree completion programs were offered in person. Due to growing limitations including work and family obligations, courses have moved to fully online or hybrid.¹⁶ One example of a bachelor completion program that prepares dental hygienists for advanced career opportunities is the program at the University of Michigan. This program includes course goals of developing leaders in the profession, preparing dental hygienists to work as members of interdisciplinary health care teams and in alternative practice settings, in addition to preparing dental hygienists for expanded roles in alternative practice settings.¹⁶

Bachelor completion programs, in addition to preparing students for advanced career opportunities, they also prepare students for graduate level degrees. A master's degree in dental hygiene generally focuses on research, leadership and educational methodology.²⁰ Master's degree programs are typically completed in two to four years depending on the rate and full or part-time enrollment. Some master's degrees require a thesis, but not all programs have this requirement. Admission requirements may vary from degree type as well as be program specific.²¹ Most have admissions requirements that include a minimal over-all GPA and a minimum science GPA.²¹ To effectively prepare for these advanced studies, a bachelor's degree is essential as it lays down the foundational knowledge and skills necessary for success. Furthermore, having dental hygienists with master degrees is important for advancing the profession as they possess enhanced expertise and the ability to lead in research and education as well as ultimately improving access to care.

Studies have shown a greater need for hygienists with graduate level degrees. The ability to advance to mid- level oral health care providers such as the Advanced Dental Therapist (ADT) and Dental Therapist (DT), will help meet the increased demand for oral health care in underserved communities. ²² The ADT is defined by the ADHA policy in 2009 as “a dental hygienist who has graduated from an accredited program and completed advanced educational curriculum approved by the ADHA which prepares the dental hygienists to provide diagnostic, preventive, restorative and therapeutic services directly to the public”. ⁴ Master’s degrees are not required by the Commission on Dental Accreditation (CODA) standards for dental therapy programs, but mid-level provider models in some states, like Minnesota, are based on a dental hygiene foundation with further education at a master's degree level. ^{4,22} There are currently four dental therapy programs offered in the US, three in Minnesota and one in Alaska.²³ As the landscape of dental hygiene continues to evolve, equipping dental hygienists with advanced degrees becomes increasingly crucial. This education can enhance professional scope, and it can allow dental hygienists to address growing disparities in oral health access. This could lead to a stronger public health system.

The dental hygiene profession has clearly demonstrated a need for growth and advancement to increase access to care. The U.S. Bureau of Labor Statistics predicts that there will be a nine percent growth in dental hygiene positions from the years 2023-2033, thus creating more than 16,400 job openings for dental hygienists.²⁴ In order to fill these projected openings dental hygiene programs will need to increase their class sizes, which would require recruiting more dental hygiene educators. The need for dental

hygiene educators will be crucial to meet these demands. Dental hygiene educators must have a bachelor's degree to teach didactic courses.¹¹ The need for educators is another reason that dental hygienists pursuing advanced degrees is crucial.

Discussion and research of future doctoral programs is currently growing in hopes to meet the needs and demands of a complex health care system and advancing the profession.^{20,22,25-27} In 2021, Jones- Teti expanded on previous research that demonstrates that there is a shortage of master's and doctoral prepared hygienists and that has contributed to the lag in growth in the dental hygiene profession. They concluded that many students pursuing a post graduate degree increased their professional and personal growth and also claimed that higher degrees gave them more credibility.²² The participants in this study felt that completing advanced education supports growth in the dental hygiene profession. In the future as the field continues to evolve, fostering the development of advanced education for dental hygienists is essential not only for individual career advancement but also for maintaining dental hygiene education programs, strengthening the profession and the overall health of communities.

Perceptions and Motivations

Research on dental hygiene education has been increasing over the last decade; however minimal studies exist regarding dental hygiene bachelor education perspectives in the United States. Several studies done in Canada have revealed dental hygienists' perceptions on obtaining a bachelor's degree. The evidence from those studies have shown that bachelor's degree graduates feel they have greater depth of knowledge, improved critical thinking skills, increased confidence, and have more opportunities outside of the traditional clinical practice.^{3,14,18,28,29} In 2022, a study by Rock et al.

explored the motivating reasons for pursuing a dental hygiene bachelor's degree in Canada. The study design was a cross-sectional and collected quantitative and qualitative data from dental hygienists with bachelor's degrees in Canada from one of the four universities currently offering this type of degree. Motivations include personal satisfaction, status/recognition of degree, increase in employment opportunities, access to graduate education, enhanced salary potential, improved critical thinking, increase in self-confidence, improved writing abilities, and family or peer influence. Open-ended questions in this survey allowed researchers to uncover additional skills and career paths not explicitly addressed in the survey. As a result, 119 in-depth responses were gathered, providing greater insight into the perspectives of individuals holding a bachelor's degree in dental hygiene. For instance, one respondent noted, "The degree provided me with opportunities to gain experience in teaching, research, and community programs, all of which I carried with me after completing my degree." Another participant mentioned, "Obtaining a bachelor's degree in dental hygiene enhanced my critical thinking skills and improved my ability to analyze research."²⁸ These results show a positive need for more bachelor's degree programs as well as a positive impact on bachelor education and clinical practice.

An analysis of dental hygiene education in Canada showed positive attitudes on significant impact of a BSDH. Research by Benbow and Kanji in 2018 also examined two groups of dental hygiene students' (2-year diploma students and bachelor's degree completion students) perspectives on bachelor's education. They found that 84 % of respondents with a two-year diploma believed that bachelor programs should be available in all provinces in Canada. At the time of the study there were only four programs in four

provinces. Students in this study also agreed or strongly agreed that a bachelor's degree in dental hygiene increases their knowledge (86%), increases their capacity to work with underserved groups (86%), enhances their critical thinking skills as well as improving their interprofessional communication (84%).³ A study by Kanji and Laronde compared entry level bachelor degree graduates and bachelor completion program graduates' professional opportunities, further education and job satisfaction. Dental hygienist bachelor graduates (72%) reported to be more satisfied with their careers compared to when they practiced with a 2-year diploma. This study showed a significant difference between the two pathways of degrees with respect to careers working outside the traditional clinical setting. Only 12% of the entry to practice (ETP) bachelor's degree graduates worked outside of clinical practice, while 41% of the bachelor completion program worked outside of clinical practice after graduation. In this study, 25% of the respondents pursued further education, approximately 21 % earned master's degrees and 4% were currently in master's degree programs. Further research in the future is needed to collect more national data with larger sample sizes to better understand the perceptions of students. Most of the research found on perceptions of dental hygienists on bachelor's degrees and bachelor's degree completion were done with surveys using 5-point Likert scale and some open-ended questions. Limitations in most of the studies included small sample sizes or low response rates.^{3,10,14–16,18,28,30,31}

Research on completion programs done by Cullen et al in 2020 examined completion program outcomes at the University of Michigan. Results were similar to research done on completion programs in Canada. The graduates expressed similar outcome perceptions and motivations, including expanded career opportunities, increased

leadership and professional networking, and advanced educational opportunities.¹⁶

Graduates of the online completion programs expressed benefits of the ability to work during the program, the balance between education and family, no need to commute, and the increased use of technology. ^{15,16}

Most of the literature confirmed that one of the main motivating influences for obtaining a bachelor's degree in dental hygiene is to expand careers beyond clinical practice.^{3,4,15,18,19,19,28-30} The accomplishments of bachelor graduates in dental hygiene were recorded in a 2008 study by Rowe et al., and the results indicated that many of the graduates had positions in education, research, and leadership in the dental hygiene profession. ¹⁹ The most significant conclusion found was that bachelor's degree graduates compared to associate degree graduates are more likely to be in roles outside of clinical practice. Thirty percent of bachelor's degree graduates held education positions compared to the four percent of associate degree graduates.¹⁹ This information was significant due to a shortage of dental hygiene educators and continues to remain a concern with dental faculty retirements and the overall shortage in dental hygienists. Career pathways that prefer or require a bachelor degree recognized by the ADHA include: corporate positions (including sales representatives, product researchers, corporate educators, and corporate administrators), public health positions (including clinicians, rural or inner city health clinics, Head Start programs, Indian Health service, school sealant programs, and administrator), research positions (including colleges and universities, government, nonprofit organizations), education positions (including clinical, classroom, director of a dental hygiene program – may require a masters), and entrepreneurs (who may own a practice management company, product development,

CE provider or meeting planner, founder of a nonprofit).³² In light of these findings, it is clear that the pursuit of a bachelor's degree in dental hygiene not only enhances individual career prospects but also addresses the critical need for qualified professionals in education and leadership roles.

Another study by Katyal and Kanji's explored why students chose dental hygiene as a major, and the survey identified the two major reasons as personal desire and past experiences. Their research once again identified the main motivating factors of expanding career opportunities (82%) and gain of increased knowledge (34%). Previous research by Kanji was noted in this study on the motivating factors of 2-year diploma dental hygiene graduates. This research concluded the difference in the entry level diploma students compared to the BSDH students was that the diploma students had third person influences and past experiences as a factor and the BSDH students did not.^{29,30} Understanding what motivates dental hygiene students choose this profession, gives us better insight to why they have a desire in advancing their education, which led them to choose a bachelor degree program. This understanding for the ongoing advancement of the dental hygiene profession.

Barriers

In addition to the perceptions on a bachelor's degree in dental hygiene, there is some research on the barriers to obtaining a bachelor's degree. Some studies identify that online programs could present as a barrier to some students who are not well versed with technology. Some students may struggle with navigating the online platforms being used to deliver the course work, causing them to spend more time figuring out how to use the system rather than learning new material.^{14,33} It was also noted by Nguyen et al. that

students transitioning into an online dental hygiene program have struggled with group projects due to difficulty in coordinating meeting times.¹⁴ One of the goals of online completion programs is to eliminate some of the barriers to access programs, since there are a limited number in the U.S. and in Canada.¹⁴⁻¹⁶

Despite published studies linking advancing education to improved career opportunities and career satisfaction, there is still not a sufficient amount of evidence on the barriers faced for dental hygiene associate degree students or graduates advancing to a bachelor's degree. In a study by Kanji and Laronde, income was evaluated between the two degrees and did not show a significant difference between annual income if you had an associate degree or a bachelor degree. Although this may not be noted as a barrier, it could be a possible deterrent for why some dental hygienists do not find value in pursuing more education.¹⁸

In similar disciplines, like nursing, there are documented barriers that students face when starting their nursing education with either an associate degree, bachelor's degree, or a completion RN-BSN. An associate degree allows nurses to enter the work force quickly, with less financial strains, including less student loan debt. Many nurses that hold an associate degree also do not believe that a substantial pay increase will come by obtaining a bachelor's degree (BSN), which influences some nurses who had reported that they are the sole provider for their family.³⁴ Some of the reported barriers include: not enough time to complete the lengthy program, lack of confidence, not enough recognition between the two degrees, and lack of basic academic support.^{34,35} These barriers in nursing could possibly reflect similar challenges faced by dental hygienists, underscoring

the necessity for the dental hygiene profession to address the educational and systemic obstacles that can hinder career advancement and limit access to higher degree opportunities.

This review presents a summary of the current landscape of research that exists on the history and background of dental hygiene education and the perceptions, motivations, and barriers for dental hygienists on pursuing bachelor's degree programs. Given the small sample size or low respondent rate for most of the studies and the lack of evidence on barriers, further research is warranted to explore the views of dental hygienists on bachelor's degree education. This research is needed to give more perspective on the reasons for additional education in the dental hygiene profession. Dental hygiene is advancing beyond traditional practice into clinical roles in medical practices, hospitals, schools, long-term care facilities, in addition to roles in community settings, and educational settings. Equally important, dental hygienists with higher clinical, educational, and leadership skills and experience are needed to address the evolving complexities of patient care, integrate into interprofessional collaboration, lead initiatives that promote healthcare, and instruct and lead dental hygiene programs.³⁶ Even though the ADHA advocated for a bachelor's degree to be the entry level dental hygiene education, the associate degree still remains the most common degree held among dental hygienists.^{2,36} With advancements in healthcare and interprofessional collaboration on the rise, the need for growth in dental hygiene is imperative to help give patients the best care and best possible outcome.⁴ Research is needed on the perceptions, motivations and barriers to understand dental hygienists attitudes and beliefs on pursuing bachelor education. The purpose of this study was to investigate and compare the perceptions,

motivations, and barriers faced by dental hygienists and dental hygiene students on pursuing bachelor degrees in dental hygiene (BSDH).

Chapter 2. Methods

This cross-sectional study was approved by the Institutional Review Board of the Ohio State University (2024E0814). This study employed a cross-sectional, survey design that surveyed dental hygienists who hold associate degrees and dental hygiene students who are currently enrolled in an associate degree program.

Sample

This study surveyed current dental hygiene students and registered dental hygienists who have an associate degree during August and September of 2024. It is important to note that dental hygienists holding a bachelor's degree were excluded from this study to focus specifically on those with an associate degree.

Dental Hygiene Students

Initially, an email was sent to all program directors of dental hygiene associate degree programs in the United States, explaining the purpose of the study along with a request that the study be forwarded to all second-year dental hygiene students for the fall semester of 2024. Contacts were obtained through the American Dental Hygienists' Association (ADHA), which provided a current list of dental hygiene education program directors. The email included a link to complete the survey. The first survey question was

the informed consent. The participants had four weeks to complete the survey. A subsequent reminder email was sent one week prior to the required completion date.

Dental Hygienists with Associate Degrees

An electronic survey created using Qualtrics was posted to several dental hygiene Facebook groups. Specifically, "Ohio Dental Hygiene," the Northeastern Ohio Dental Hygienists Association (NEODHA), the Dental Hygiene Network, the American Dental Hygiene Association (ADHA), and The Dental Hygiene Research Group. Prior to posting, permission was obtained from the group administrators to share the survey within these communities. The post explained the purpose of the study and included an invitation for any dental hygienists who hold an associate degree as their highest degree to complete the survey. The post also included a link to the survey which included an informed consent question. Participants had three weeks to complete the survey, and a subsequent reminder was posted on the same social media sites one week prior to the required completion date. The reminder post was attached to the initial posting as a new posting.

Survey

The survey was a 20 item, confidential online survey that was developed in Qualtrics (Provo, UT). The survey was modified from two surveys used to determine motivations and barriers of nurses on pursuing bachelor degrees and perceptions and motivations of dental hygienist on pursuing a doctoral degree. The modified instruments used for perceptions and the potential motivators and barriers is known as the "Cavanaugh instrument" and Perceived Perceptions survey.^{20,37} The survey consisted of 20 items that measure the perceptions, motivations, and barriers of pursuing a bachelor degree in a

dental hygiene program, that consisted of statements related to the perceptions, motivations and barriers that were measured on a 4 point Likert scale, ranging from 1=Extremely Important to 4= Not at all important.

Perceptions

Perceptions were assessed using an adaptation of a survey that was developed by Tumuth and Walsh and used in the study regarding perceptions of dental hygiene master's degree learners²⁰. The original instrument was pilot tested for face validity by using a panel of 8 dental hygienists and revised based on feedback about clarity and length of the survey item, and the time required to complete the survey items. The final survey consists of twenty items. ²⁰ Of the perception items, four were used and modified, two were omitted. All the items were measured by either yes/ no, multiply choice response items, and with a 4-point Likert scale ranging from 1=Extremely Important to 4= Not at all important.

Motivations and Barriers

Motivations and barriers were assessed using an adaptation of a survey that was adapted from the study "Motivators and Barriers to Returning to School, RN to BSN" by Romp et al. The survey was modeled after an instrument developed by Cavanaugh (1990). The Cavanaugh instrument was determined to be reliable and valid.

Chapter 3. Results

A total of 442 respondents participated in the study, comprising 198 dental hygiene students (DHS) (44%) and 244 registered dental hygienists (RDHs) (55%). Most participants were female (87.1% RDHs and 92.3% DHS), with a smaller representation of males (12.5% RDHs and 6.1% DHS). Most dental hygienists were aged 25-42 years (59.3%), while dental hygiene students were predominantly 19-24 years old (61.8%). The racial composition was mainly White/Caucasian among both dental hygienists (78.7%) and dental hygiene students (59.2%) (Table I). The family educational background of participants' parents varied, with 43.8% of dental hygienists reporting their fathers had a high school diploma or GED, and 44.6% indicating the same for their mothers. Fewer parents held Master's or Doctoral degrees (Table II).

Perceptions

A significant proportion of both dental hygienists (73%) and dental hygiene students (87.4%) rated bachelor's degree programs as extremely or somewhat important (Table III). Additionally, 56% of dental hygienists and 64% of dental hygiene students strongly agreed or agreed that bachelor's degrees are needed. Sixty-two percent of RDHs

and 80% of dental hygiene students supported the bachelor's degree in dental hygiene (Tables III and IV).

Motivators

A significant proportion of respondents believed that a Bachelor of Science in Dental Hygiene (BSDH) would facilitate promotions to leadership or educational roles (82.8% RDHs, 90% students). Less than half (43%) of RDHs and more than half (64%) of DHS agreed that encouragement from supervisors, educators, or peers influenced their consideration of earning a BSDH. The majority of both groups (RDHs 85%, DHS 90%) agreed that financial support would ease obtaining a BSDH. Other motivators included expanding dental hygiene knowledge, increasing confidence, commanding greater respect, and obtaining a BSDH for more convenient hours (Table V).

Barriers

The most frequent barrier reported was inflexible work schedules (79% RDHs, 83% DHS). Other significant barriers included family situations (76% RDHs, 67% DHS), financial constraints (60% RDHs, 62% DHS), and lack of time (65% RDHs, 62% DHS). Nearly half of participants (49% RDHs, 38% DHS) felt there were insufficient financial rewards to returning to school. The concern of lack of computers or computer knowledge was the least reported barrier (18% RDHs, 27% DHS) (Table VI).

Open-ended questions revealed that the top motivators for pursuing a BSDH were increased schedule flexibility and alternative career opportunities. The main barrier was

the lack of financial aid or high tuition costs. Other concerns included time, family obligations, and minimal financial gain with a BSDH.

A logistic regression model showed that the predictors of parents' education levels did not significantly contribute to the perceived importance of a bachelor's degree ($df=63$, $p=0.523$). A second logistic regression model examined the relationship between the perceived importance of a bachelor's degree and predictors such as age range and gender. Gender was a significant predictor, with females less likely to consider a bachelor's degree important compared to males (Estimate = 2.060, $p<0.001$). Age range did not significantly predict the perceived importance of a bachelor's degree ($p>0.05$).

Chapter 4. Discussion

The American Dental Hygienists' Association has supported the bachelor degree in dental hygiene as the minimum entry level for dental hygiene practice since 1986.³⁸ Growing evidence among other similar health care professions shows that the dental hygiene profession is one of the few allied health professions that has not advanced the educational model for entry-level practice³⁹. The results from this study demonstrate a clear consensus among practicing hygienists and dental hygiene students that a bachelor of science in dental hygiene (BSDH) is an important educational goal.

Dental Hygienists

Seventy-three percent of dental hygienist respondents indicated that bachelor's degree programs are either extremely or somewhat important. This strong support reflects a recognition of the evolving landscape of oral healthcare and the necessity for higher education to meet the comprehensive community health needs. This sentiment aligns with trends observed in other healthcare disciplines, where advanced degrees are increasingly seen as essential for ensuring high-quality care and for equipping professionals with the skills necessary for leadership roles and interprofessional collaboration.⁴⁰ For example, similar shifts toward higher educational standards have been documented in nursing, where bachelor's and advanced degrees have become standard expectations for practice.⁴¹ Moreover, the 56% of dental hygienists who agreed on the necessity of a

bachelor's degree illustrates a foundational belief that advancing education correlates with improved roles in clinical practice, leadership, and community health initiatives.

Motivations

The motivations for pursuing a BSDH are well-articulated among the dental hygienist respondents. With 82.8% indicating that obtaining a BSDH would facilitate promotions to leadership roles, it's clear that professional advancement is a priority for many in the field. Additionally, the belief held by 85% that financial support would make pursuing such a degree easier highlights the role in the need of institutional backing in fostering educational advancement. These findings are similar to Canadian studies done by Katyal et al which also concluded that agreed importance and motivations for bachelor degrees in dental hygiene.^{18,30,33,42} Some of the similarities highlighted between these studies were the agreement of importance bachelor education has for the dental hygiene profession and that one of the gains from obtaining a BSDH including alternative career pathways such as education or leadership positions.

This was also shown in studies regarding similar healthcare disciplines. A study by Romp et al revealed that the majority of the nurses with associate degrees surveyed believed that obtaining a bachelors in nursing (BSN) would make it easier to get a promotion in leadership and education, as well as easier to obtain another nursing position in general.³⁷ The parallels drawn from both Canadian studies and research in related healthcare disciplines, such as nursing, further affirm the significance of

bachelor's degrees in shaping career trajectories and fostering leadership within the profession. As the dental hygiene field continues to evolve, these insights should encourage ongoing dialogue about the necessity of supporting educational pursuits, ultimately benefiting both practitioners and the patients they serve.

Dental Hygiene Students

Dental hygiene students' perceptions of the bachelor's degree showed that 87.4% attributed extreme importance or somewhat importance to these programs. The prevailing belief that they support bachelor education indicates a proactive approach toward their futures and a desire to enhance their competency and contributions to the healthcare system. This underlines the importance of bachelor education as not just a personal growth opportunity, but to elevate the profession.

Students exhibit similarly strong motivational drive towards obtaining a BSDH, with 90% agreeing that such a degree also enhances their leadership prospects. Interestingly, a greater proportion of dental hygiene students (60%) felt influenced by supervisors or peers to return to school, compared to their RDH counterparts (43%). This could suggest a strong cultural environment within educational institutions that promotes academic achievement and highlights the importance of mentorship in guiding students towards advanced education.

The regression analysis revealed that gender significantly influences the perceived importance of a bachelor's degree in the dental hygiene profession. Females were found to be less likely to consider a bachelor's degree important compared to males (estimate 2.06, $p < 0.001$). A study recently done at Pew Research center reported that 47% of U.S women ages 25-34 have a bachelor's degree compared with 37% of men.⁴³ This study suggests a trend where higher parental education levels may correlate with greater educational attainment among offspring, particularly among women. The discrepancy between these findings and our study indicates a need for further investigation into the specific factors influencing dental hygienists' perceptions of higher education. It raises important questions about what other variables, such as personal, professional, or cultural influences might be more significant in determining attitudes towards advanced education in this profession.

Another regression model revealed that neither the mother's nor the father's highest level of education significantly predicts the perceived importance of a bachelor's degree in the dental hygiene profession. This finding suggests that parental education levels may not play a crucial role in shaping attitudes towards a bachelor's degree in this situation. Interestingly enough, this does not match findings done in recent studies by Pew research institute. These studies show that 60% of young adults who have one parent with at least a bachelor's degree complete college and that increases to 82% complete some sort of a college degree if both parents have a bachelor's degree.⁴⁴

Barriers

Despite clear benefits identified, this research also unveiled significant barriers that hinder the pursuit of bachelor's degrees among dental hygienists. Many individuals expressed concerns when asked to list their top barriers, stated that financial constraints, family obligations and a perceived lack of substantial salary increases that may follow graduation.

Inflexible work schedules were overwhelmingly recognized as a significant impediment, with 79% of respondents agreeing. This indicates a systemic issue within employment structures that often do not accommodate missing worktime for projects and demanding workload that is encompassed in an online program. Lack of awareness of online completion programs for dental hygiene could also purpose concern. Additionally, 60% agreed that financial constraints were a barrier, raising concerns regarding the affordability of bachelor programs. According to the American Dental Education Association (ADEA), the average cost of a bachelor's degree in dental hygiene is around \$36,000, while an associate's degree costs approximately \$22,000.⁴⁵ If students were better informed about the actual costs and potential long-term benefits of obtaining a bachelor's degree, they might be more inclined to pursue this higher educational path, ultimately leading to improved professional opportunities and outcomes. Examining data in detail on the average costs and time commitments of associate degree vs. bachelor's degree programs can provide valuable insights into this perception. If the financial and

time investments required for associate degree programs are comparable to those for bachelor's degree programs, this could challenge the notion that financial factors primarily restrict advancement in education for dental hygienists. Alternatively, this discourse could provide a basis for future studies aiming to analyze the return on investment of higher educational attainment in dentistry, emphasizing the long-term benefits for both individual practitioners and the communities they serve. Also, consideration of grants and scholarships could also help contribute to reducing some of the financial barriers expressed during this study.

Surprisingly, this group of respondents reported that technology or online learning was not a barrier to pursuing a bachelor's degree. In the past this was a concern for students returning back school after a gap of time. Research by Nguyen et al on transitioning into an online dental hygiene degree-completion program showed that this was a concern for some students returning to school that struggled initially with navigating online platforms and use of technology. This study recommended that future use of online completion programs provide introductions about navigating learning platforms through orientation videos and or live webinars over the summer prior to the semester the students start the program.¹⁴

Implications for Practice

The implications of these findings are far-reaching and suggest the necessity for concerted efforts from educational institutions, policymakers, and healthcare systems to

mitigate barriers and enhance educational accessibility. Increasing financial aid opportunities and scholarship offerings tailored for dental hygienists pursuing higher education could encourage enrollment in bachelor programs thus leading to higher enrollment in master degree programs for dental hygiene. Additionally, creating mentorship programs that connect prospective students with recent graduates may provide essential support and guidance.

Unfortunately, there is not a well-defined career ladder within a clinical nature for dental hygienists unless it is very specific to a scope of practice within a certain state. Advancement in dental hygiene scope of practice in relation to degree is something that could be considered. Fourteen states allow a dental therapist (DT) or advanced dental therapist (ADT) to provide extended services to underserved population.^{23,46,47} These licensures require a bachelor's degree or higher with specific training. This educational foundation equips dental hygienists not only with comprehensive clinical skills but also the necessary knowledge to navigate complex clinical scenarios and understand broader public health implications. Advancing scope of practice for dental hygienists nationally would surely give purpose to the rise of a higher degrees for dental hygienists and help contribute to improving the dental health professional shortage. As access to care remains a significant barrier for many populations and the addition of DT's and ADT's into the healthcare workforce could be a potential solution. Currently, around 57 million Americans live in an area with these types of shortages, contributing greatly to the health

disparities in oral health. The Dental Workforce model that was recently proposed by American Dental Association(ADA) and adopted by the American Legislative Exchange Council (ALEC) which allows dental assistants to perform scaling, which is under the scope of dental hygiene practice.^{48,49} The ADHA and the American Dental Education Association (ADEA) are both opposed to this act citing concerns on safety as well as the ADHA reiterated that access to care could better be served by dental therapists.⁴⁹ This is further reasoning on the importance of advancing the dental hygiene profession by highlighting education beyond entry level.

Dental Hygiene Faculty Shortage

Dental hygienists pursuing advanced degrees has an impact on the education of future dental hygienists. It is projected that there will be a shortage of dental hygiene faculty members, which possess significant challenges to dental hygiene education and the profession as a whole.⁵⁰⁻⁵² The Commission on Dental Accreditation (CODA) plays a critical role in establishing educational standards that ensure quality and effectiveness of dental hygiene programs. According to standard 3-6, it is mandated that dental hygiene faculty members that teach didactic courses must possess at least a bachelors or higher degree, while standard 3-3 states that program directors must possess a master's degree or higher.⁵³ Standard 3-6 was recently changed in January of 2025, it use to mandate that a bachelor degree was mandated for clinical and lab courses as well. These requirements are designed to maintain high educational standards and ensure students receive

comprehensive instruction from qualified professional. However, with these stringent qualifications in place, it could be possible cause for dental hygiene faculty, again showing the need for dental hygienists with bachelor's degrees. As the demand for dental hygiene education continues to rise other issues come into play with the expansion dental hygiene programs to allow more students to enter, the increasement of faculty must happen to comply with CODA's faculty to student ratio in standard 3-5. With a limited pool of dental hygienists with bachelor degrees presents a gap in education within the field, presenting the necessity of promoting bachelor's degrees.

The increasing demand for dental hygienists in clinical settings often runs counter to the supply of qualified educators for dental hygiene programs. As the workforce expands to meet the needs of a growing population, the pipeline for dental hygiene educators is simultaneously facing challenges due to a shortage of faculty. The need for qualified educators is critical, given that dental hygiene programs require faculty with advanced degrees for teaching and administrative roles. The dilemma lies in attracting practicing dental hygienists to pursue advanced degrees, thereby ensuring a well-prepared educational workforce to meet the growing demand for dental hygiene practitioners. This creates a complex scenario of enhancing clinical workforce numbers while simultaneously addressing the urgent need for well-qualified educators, underscoring the importance of higher education initiatives in supporting both objectives.

Limitations

Limitations for this study include sample size of dental hygienists may not accurately represent the broader population. According to the United States Bureau of Labor Statistics there are currently over 200,000 dental hygienists in the United States, however there is no centralized data base from which to directly contact them for participation in the study. As a result, social media recruitment was used to obtain a pool of hygienist respondents.⁵⁴ This approach presents a limitation, as not all hygienists may be active on social media.

Additionally, access to dental hygiene students was limited. While requests were forwarded through program directors, this method may have resulted in inconsistent outreach and participation rates, as some institutions opted not to allow the research since it was not approved through their institutional review board.

Future research

The present study has highlighted several key findings regarding the perceptions, motivations, and barriers of dental hygienists pursuing a Bachelor of Science in Dental Hygiene (BSDH). However, there are several areas where future research is needed to further our understanding of this phenomenon and inform strategies for promoting higher education among dental hygienists. Future research should aim to investigate long-term outcomes of dental hygienists with BSDH career satisfaction, advancing to a master's degree or higher, and impacts on patient care. More comparative studies could in

different countries or regions could gain insight to culture differences between hygienists' education and how they impact the profession.

Conclusion

Despite the limitations of this study, the findings provide insights to dental hygienists' perceptions, motivations and barriers to obtaining a bachelor's degree in dental hygiene. The finding suggest that dental hygienists and future dental hygienists perceive a BSDH as essential for career advancement and leadership. However, the barriers to pursuing a bachelor's degree remain significant, and concerted efforts are needed to mitigate these obstacles. Knowing and being prepared to address these barriers and motivators of dental hygienists and future dental hygienists can help dental hygiene professionals and educators be more successful in guiding dental hygienists to pursue further education. The importance of mentorship programs, institutional and financial support is evident and needed to create educational advancement in dental hygiene. Additionally, this study's findings have implications for policymakers, educational institutions, and healthcare systems to advance the dental hygiene profession by promoting higher education.

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Appendix A. Tables

Table I : Demographics and Characteristics of Study Population		
	n	%
Dental Hygiene Student	198	44
RDH	244	56
Total	442	100
Age		
	RDH	DH Students
	n (%)	n (%)
19 to 24	17 (7.1)	121 (61.8)
25 to 30	44 (18.8)	50 (25.5)
31 to 36	58 (21.7)	19 (9.7)
37 to 42	45 (18.8)	5 (2.5)
43 to 48	50 (16.7)	1 (0.5)
49 to 54	36 (15)	0 (0)
55 to 56	5 (2.1)	0 (0)
Gender		
Male	30 (12.5)	12 (6.1)
Female	209 (87.1)	181 (92.3)
Non-binary	1 (.4)	3 (1.5)
Race		
African American	10 (4.2)	7 (3.6)
Asian	8 (3.3)	5 (2.6)
Hispanic	9 (3.8)	43 (21.9)
Native American	15 (6.3)	15 (7.7)
Pacific Islander	2 (0.8)	0 (0)
White/ Caucasian	188 (78.7)	116 (59.2)
More than one race	5 (2.1)	5 (2.5)
Other	2 (0.8)	5 (2.5)

Table II: Parents Educational Background		
Fathers Highest level of Education	Dental Hygienist	Dental Hygiene Student
	n (%)	n (%)
Less than a high school diploma or a GED	21 (8.8)	25 (12.8)
High School diploma or GED	105 (43.8)	79 (40.3)
Associates degree	35 (14.6)	34 (17.3)
Bachelor's degree	45 (18.8)	36 (18.4)
Graduate degree	17 (7.1)	15 (7.7)
Doctorate degree	14 (5.8)	2 (1)
Unsure	3 (1.3)	5 (2.6)
Mothers Highest Level of Education		
Less than a high school diploma or a GED	19 (7.9)	14 (7.1)
High School diploma or GED	107 (44.6)	81 (43.3)
Associates degree	32 (13.3)	40 (20.4)
Bachelor's degree	50 (20.8)	44 (22.4)
Graduate degree	24 (10)	14 (7.1)
Doctorate degree	6 (2.5)	2 (1)
Unsure	2 (0.8)	1 (0.5)

Table III : Importance Perception				
How Important to the dental hygiene profession are dental hygiene bachelor degree programs?	Extremely important	Somewhat important	Somewhat unimportant	Not at all important
	n (%)	n (%)	n (%)	n (%)
Dental Hygienist	55 (24)	112 (49)	43 (19)	22 (8)
Dental Hygiene Student	60 (31)	110 (56)	23 (12)	2 (1)

Table IV: Perception Statements				
Statements	Strongly agree	Agree	Disagree	Strongly disagree
	n (%)	n (%)	n (%)	n (%)
<i>Bachelors' dental hygiene education is needed.</i>				
Dental Hygienist	44 (19)	86 (37)	83 (35)	20 (9)
Dental Hygiene Student	31 (16)	94 (48)	58 (30)	11 (6)
<i>Most dental hygienists support bachelor education.</i>				
Dental Hygienist	33 (14)	111 (48)	83 (36)	6 (2)
Dental Hygiene Student	24 (18)	122 (62)	35 (18)	3 (2)
<i>I am interested in pursuing a bachelor's degree.</i>				
Dental Hygienist	61 (26)	71 (31)	59 (25)	41 (18)
Dental Hygiene Student	53 (28)	82 (42)	41 (21)	46 (8)

Table V: Motivation Statements				
Statement				
	Strongly agree	Agree	Disagree	Strongly disagree
A BSDH would make it easier to get a promotion to a leadership or educational role.	n (%)	n (%)	n (%)	n (%)
RDH	66 (31)	112 (52)	29 (14)	8 (3)
Dental Hygiene student	52 (29)	110 (61)	17 (9)	1 (<1)
A BSDH would make it easier to obtain another dental hygiene position, in general.				
RDH	37 (17)	70 (33)	69 (32)	38 (18)
Dental Hygiene student	35 (19)	99 (55)	39 (22)	7 (4)
I have considered earning my BSDH because my supervisor, educator, or peers, have encouraged me to return to school.				
RDH	28 (13)	64 (30)	66 (31)	57 (26)
Dental Hygiene student	28 (16)	85 (48)	53 (30)	12 (6)
Obtaining my BSDH would expand my dental hygiene knowledge.				
RDH	42 (20)	106 (50)	48 (22)	18 (8)
Dental Hygiene student	51 (28)	106 (59)	19 (11)	3 (2)

Table V Continued

Obtaining my BSDH would increase my confidence.				
RDH	34 (16)	88 (41)	61 (28)	32 (15)
Dental hygiene student	40 (22)	103 (59)	29 (16)	7 (4)
Dental hygienists with a BSDH command greater respect as professionals.				
RDH	27 (13)	72 (33)	79 (37)	37 (17)
Dental Hygiene student	27 (15)	88 (49)	55 (30)	10 (6)
Earning a BSDH could result in a position with more convenient hours				
RDH	25 (12)	69 (32)	76 (35)	45 (21)
Dental Hygiene student	28 (16)	84 (47)	60 (33)	8 (4)
Financial support would make it easier for me to obtain my BSDH				
RDH	73 (34)	109 (51)	22 (11)	9 (4)
Dental Hygiene student	74 (41)	88 (49)	15 (8)	3 (2)

Table VI: Barrier Statements	Strongly Agree	Agree	Disagree	Strongly Disagree
Inflexible work schedules would make going back to school challenging for me.	n (%)	n (%)	n (%)	n (%)
RDH	59 (28)	109 (51)	32 (15)	13 (6)
Dental Hygiene student	48 (27)	101 (56)	26 (15)	4 (2)
My financial situation prohibits me from obtaining a BSDH.				
RDH	51 (24)	76 (36)	64 (30)	21 (10)
Dental Hygiene student	26 (14)	85 (48)	59 (33)	8 (5)
My personal responsibilities prohibit me from obtaining a BSDH.				
RDH	36 (17)	84 (40)	73 (34)	19 (9)
Dental Hygiene student	16 (9)	68 (38)	87 (49)	8 (4)
My family situation would make it difficult to pursue a BSDH.				
RDH	85 (40)	77 (36)	36 (17)	15 (7)
Dental Hygiene student	41 (23)	80 (44)	50 (29)	8 (4)
I do not feel there are enough financial rewards for returning to school.				
RDH	26 (12)	79 (37)	77 (31)	31 (15)
Dental hygiene student	20 (11)	48 (48)	94 (53)	16 (9)

Table VI Continued

My lack of knowledge of computers and computer programs would be a barrier for returning to school.				
RDH	7 (3)	33 (15)	84 (39)	89 (42)
Dental Hygiene student	5 (3)	42 (24)	65 (36)	67 (37)
Lack of time would prevent me from returning to school.				
RDH	41 (19)	98 (46)	50 (24)	23 (11)
Dental Hygiene student	16 (9)	95 (53)	53 (30)	14 (8)

Table VII: Mean Values of Perceptions, motivations, and barriers			
Perception Statements	RDH	Student	P value
	Mean ± sd	Mean ± sd	0.01
<i>Bachelors' dental hygiene education is needed.</i>	2.66±0.57	2.75±0.58	p=.145
<i>Most dental hygienists support bachelor education</i>	2.73±0.48	2.96±0.46	p=<.001
<i>I am interested in pursuing a bachelor's degree.</i>	2.66±0.69	2.90±0.65	p=<.001
Motivation Statements			
<i>A BSDH would make it easier to get a promotion to a leadership or educational role.</i>	3.10±0.76	3.18±0.61	p=0.11
<i>A BSDH would make it easier to obtain another dental hygiene position, in general.</i>	2.50±0.97	2.90±0.74	p=<.001
<i>I have considered earning my BSDH because my supervisor, educator, or peers, have encouraged me to return to school.</i>	2.29±1.00	2.70±0.80	p=<.001
<i>Obtaining my BSDH would expand my dental hygiene knowledge.</i>	2.80±0.85	3.15±0.66	p=<.001
<i>Obtaining my BSDH would increase my confidence.</i>	2.58±0.92	2.98±0.73	p=<.001
<i>Dental hygienists with a BSDH command greater respect as professionals.</i>	2.41±0.91	2.73±0.78	p=<.001
<i>Earning a BSDH could result in a position with more convenient hours</i>	2.34±0.06	2.73±0.58	p=<.001
<i>Financial support would make it easier for me to obtain my BSDH</i>	3.15±0.77	3.29±0.69	p= .03
Barrier Statements			
<i>Inflexible work schedules would make going back to school challenging for me.</i>	3.00±0.82	3.08±0.70	p=.17
<i>My financial situation prohibits me from obtaining a BSDH.</i>	2.74±0.93	2.72±0.76	p=<.001

Table VII Continued

<i>My personal responsibilities prohibit me from obtaining a BSDH.</i>	2.65±0.86	2.51±0.72	p=.05
<i>My family situation would make it difficult to pursue a BSDH.</i>	2.47±0.88	2.40±0.80	p=.22
<i>I do not feel there are enough financial rewards for returning to school.</i>	3.09±0.92	2.86±0.81	p=.005
<i>My lack of knowledge of computers and computer programs would be a barrier for returning to school.</i>	1.80±0.81	1.92±0.84	p=.09
<i>Lack of time would prevent me from returning to school.</i>	2.74±0.89	2.63±0.75	p=.10