Perceptions of Dental Hygiene Students/Dental Hygiene Directors on the Integration of a Spanish Language Course in the Dental Hygiene Curriculum

THESIS

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Abstract

As 63% of the limited English population are compromised by Latinos and Spanish being the second most spoken language in the United States, there is an opportunity for language concordant care to be used in dental hygiene clinics. To create culturally competent providers that demonstrate language concordant care, the study aims to understand dental hygiene students' and directors' perceptions of integrating a Spanish language course into their program. A Qualtrics survey adapted from two previous research studies, was sent via email to 327 CODA accredited dental hygiene programs during the months of October-November 2021. Dental hygiene program directors were directed to relay a separate email to final year dental hygiene students. Additionally, social media posts were used to gain more participation. One hundred and nineteen full student responses were recorded for this study. Of the 119 responses, 72.3% of the students indicated they are willing and able to develop their Spanish language skills to serve a limited English proficient community. These students noted the reason they believe it would be fundamental for students to learn Spanish was due to majority of their LEP population speaking Spanish in the dental clinic and it would also help students become culturally competent providers (56.3%).

Thirty-four full responses were recorded from dental hygiene program directors. Most of the directors indicated there are no resources available to use for managing LEP patients and no formal instruction (41.2%). Based on plans to integrate a language training course, majority of hygiene directors indicated they would choose Spanish (55.9%). The responding directors also indicated that it would be "extremely unlikely" (52.9%) to accommodate a Spanish

language into the existing curriculum. Growing Spanish speaking LEP communities provide an opportunity for language concordant care to be used in dental hygiene clinics. Studies are needed to reveal best practices for developing and creating a language course into the existing dental hygiene curriculum.

Dedication

I want to dedicate this to my family, whose support means the absolute world to me. A special thanks to my parents, Fernando and Angelica, whose words of encouragement kept me going. My siblings, Viannesi and Alexander, who are very special and motivate me each day.

I also dedicate this thesis to my many friends and family who have endlessly supported me throughout this process. You indeed are my cheerleaders.

Lastly, I would like to dedicate this to my best friend and favorite study buddy, Candi. The dog who never left my side and always made me smile. Although she is no longer with us, her love still lives on. So, this one is for her.

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Chapter 1: Review of the Literature

INTRODUCTION

Cultural competence and linguistic abilities have been found in the literature to overlap.[1] Linguistic ability is essential to connect and is the basis of effective communication. The importance of having a culturally competent health professional is not a new topic in healthcare literature. Becoming a culturally competent individual able to communicate with others linguistically is a step toward multicultural diversification into healthcare. With the diverse population seen around the United States, learning another language in a health professionals' program is considered every year. Approximately 18.5% of people in the United States make up Hispanic and Latino origin.[2] Also, 13.5% of the population speaks Spanish at home, making it the second most spoken language in the United States.[2] Currently, there is an insufficient number of Spanish-speaking healthcare clinicians to meet these patients' demands in numerous communities in the United States.[3] To help combat health disparities in these communities with current language barriers[4], institutions need to find alternatives to help support this growing population. This literature review aims to view cultural competency, current law/regulations, courses teaching Spanish, and their teaching strategies to reduce disparities and increase care quality.

CULTURAL COMPETENCY/SENSITIVITY

The definition of cultural competency from the CODA states that cultural competency is "having the ability to provide care to patients with diverse backgrounds, values, beliefs, and behaviors, including tailoring delivery to meet patients' social, cultural, and linguistic needs."[5]

Cultural competency in dental programs is designed to create culturally sensitive providers. Graduating dental/dental allied students are required to value differences in diverse populations. As the patient pool makes up variations in culture, languages, and beliefs, graduating dental students must learn what being culturally competent requires. For there to be cultural competency, a dental program must create an environment that "ensures an in-depth exchange of ideas and beliefs across gender, racial, ethnic, cultural, and social-economic lines."[5] Part of being culturally competent focuses on exchanging ideas and beliefs in one's native language. As a provider, speaking the same language as a patient requires language concordant care. A Spanish language task force created in 2009 has defined language concordant care as "a patient having an appointment with his or her assigned primary care physician who was highly proficient in the patient's preferred language."[6] While primary care physicians are not the population of interest in this review, overlap in both language and cultural competence are seen throughout literature[1] and the foundation of this literature review. Further evaluation of language concordant care and cultural competency seen in dental/dental allied programs examine further insight on the topic at hand. These implemented accreditation standards for dental/allied programs are seen to deal with cultural competency and ensure effective communication with all patient populations.

Accreditation Standards and Regulations for Healthcare Professionals, Institutions, and Patients

The 2020 CODA accreditation standards for graduating dental students include competence in providing care in diverse populations and proper interpersonal and communication skills.[5] Additionally, the revised 2019 Dental Hygiene Accreditation standard 2-15, states that dental hygiene graduates must be competent in “communicating and

collaborating with other members of the healthcare team to support comprehensive patient care.[7] Achievement of this standard facilitates basic principles of culturally competent care, health literacy, and effective communications for all patient populations. Furthermore, recognizing health disparities and the importance of meeting the healthcare needs of underserved populations form the basis of patient-centered approaches.[5] Accreditation standards are put in place for dental schools to comply with them. Failure for students to comply with accreditation standards can result in a dental institution or program to lose CODA accreditation. Many states require dental students and allied dental providers alike to graduate from a CODA-accredited institution.[8] Loss of this accreditation may mean that students cannot apply for licensure, and the institution is not complying with basic requirements for certification.

Noncompliance with language concordant care by institutions can affect federally funded programs. Laws and regulations that support and protect limited English proficient patients (LEP) are protected by the Joint Commission and Title VI of the 1964 Civil Rights Act. Guidelines for The Joint Commission specify quality care to be stemmed from effective communication, cultural competence, and patient- and family-centered care. [9] Standards set forth by The Joint Commission also require hospitals and dental clinics to provide interpreter services for all limited English proficient patients.[9] Title VI of the 1964 Civil Rights Act was enacted to sustain funding from federal programs or activities that discriminate based on race, color, or national origin.[9] LEP patients that are not allowed to participate in these federally funded programs is a violation against national origin discrimination mandated by Title VI. Laws and regulations are used to protect LEP patients from receiving care and ensure appropriate

services are provided for them. Failure to comply with these regulations can result in legal consequences. Providing LEP patients the opportunity to exchange ideas with their provider leaves an opportunity for healthcare professionals to learn the patients' language. Speaking the same language as a patient introduces language concordance. To effectively introduce language concordant care, a healthcare professional must first learn about cultural competency.

Creation of Cultural Competency Education

The ADEA Compendium of Curriculum Guidelines Allied Health Professionals emphasizes that cultural competency, "should be embedded throughout the curriculum".[10] These guidelines suggest that cultural competence should be used in clinical and preclinical dental hygiene clinics, for the care of special needs patients, ethics, and professionalism courses.[10] Integration of cultural competence into education for healthcare professionals is seen throughout literature and is advancing every day.[11,12] Although this literature review focuses on dentistry and allied programs, medicine, and their respective fields will add perceptiveness in integration methods of cultural competency into healthcare programs. The creation of a *Blueprint for Integration of Cultural Competence* (BICCC) framework for teaching cultural competence by the taskforce, Master Teachers Taskforce for Cultural Competency, walk us through the steps of integrating cultural competency into a nursing curriculum.[11] This 2008 article focused on implementation into each year of a nursing school curriculum. Each year, specific objectives were written with varying knowledge, skills, and attitudes/awareness following Bloom's taxonomy.[11] Developing a foundation and introduction to diversity, health disparities, and analysis of individuals' health and illness within small groups are a few examples of the focus of each academic year. Furthermore, the article ends with a thorough explanation

of the need for cultural competency in curricula, stating "integrating cultural competence into nursing education is no longer a choice but a requirement that builds on the values of the racially and culturally diverse population of the United States for optimal patient care."[11]

The value and relevance of cultural competency in nursing are also being noted in dental hygiene programs.[11,12] To view how U.S. dental hygiene programs incorporate cultural competency into their hygiene curriculum, Ocegueda et al. surveyed the participating dental hygiene programs (both associate and bachelor) for this purpose. Findings include that approximately 91% of program directors reported that cultural competency education had been incorporated into their curriculum in some manner, with 83% of those programs stating this curriculum to be a part of the overall program learning outcomes.[12] The most significant reason they included cultural competency as part of their program was due to "improvement of students' skills to treat a diverse patient population" and to "increase student's attitudes of prejudices or biases towards other cultures".[12] Serving a diverse population and accreditation requirements were seen as the utmost importance. Cultural competency integration into a healthcare curriculum requires various methods and appropriate faculty to do so.

The Teaching of Cultural Competence

Teaching strategies to incorporate cultural diversity in teaching is varied. One example is the BICCC framework who anticipates students to apply their assignments to a diverse clinical setting. Inviting guest speakers from diverse backgrounds to lecture and discussion are part of the didactic plan. Implementation of case studies and role-playing with interviews, taking health histories, and performing physical assessments, are a few of the activities teachers may implement. Approximately 72% of dental hygiene programs incorporate cultural competency

education into other courses, with only 8% of them offering a separate course.[12] Didactic lesson plans are also seen as relevant in the dental hygiene curriculum, with 83% of program directors relying on lectures to introduce cultural competency concepts.[12] Participation in community outreach programs is also noted in dental hygiene courses. While the BICCC accounts for student evaluations in addition to routine examinations, 42% of dental hygiene programs that participate in outreach programs do not evaluate their students.[11,12] Further studies are needed to focus on the evaluation strategies for cultural competency knowledge and skills sets.

With the inclusion of community outreach programs seen as part of dental hygiene cultural competency education, the focus is on the validity and impact of clinical community rotation on their cultural competency. Classe-Cutrone et al. used a modified clinical cultural competency questionnaire to study cultural competence in Texas's dental hygiene students. This particular questionnaire measured their self-assessment of cultural competence regarding "knowledge, skill, comfort, and attitude".[13] The largest population in the community rotations were Hispanic/Latinos, while white/Caucasian were seen as a majority in the program clinics.[13] Location of community rotations were varied and ranged from jails, hospitals, schools, and public clinics. Time spent in community rotations were also different and fluctuated between 0 to 108 hours. Findings included the amount of time spent, differences in the type of rotations, and number attended, would significantly affect students' cultural competence scores.[13] Further findings included students spending more than 50 hours in community rotations had higher evaluations of knowledge and a higher score in cultural competence.[13] Further self-assessment measures were utilized to reflect students' perceptions of the quality of education they were receiving. With 76% of dental hygiene programs[12] allowing students to participate in

community outreach programs, other states are needed to enhance the literature further. Implementation strategies to introduce a cultural competency course in other healthcare courses help programs achieve standards set forth by accreditation agencies.

Implementation of Cultural Competence

Many other healthcare programs are currently implementing cultural competency in some way, shape, or form. The framework introduced for nursing, the BICCC, is an example of a particular framework dedicated to the nursing curriculum. Applying knowledge first about culturally competent care and then applying that knowledge in a real clinical setting is the basis for most of these frameworks.[11,14] This particular idea was used in a study to assess the cultural sensitivity among psychiatric mental health nurse practitioner students. Students were asked to complete a 15-week course dedicated to integrating culturally competent care. Evaluations on their perceptions to be racially sensitive providers were given before and after completion of the program. After completing the program, their behavioral perceptions were later measured in a clinical setting with patients. Use of similar teaching materials included in the didactic components featured in the guidelines of the BICCC[11], Boyer et al. concluded that advanced students trained in culturally competent care had higher racial and cultural sensitivity.[14] Training of culturally competent care in dentistry needs to be studied further to measure their sensitivity level. Once this is obtained, the students' perceptions are to be evaluated to understand their level of comfort in providing culturally competent care.

Perception of Cultural Competence

Student perceptions of their cultural competency are viewed in many ways. Self-assessment strategies used for curriculum integration[11] and implementation of training and

experiences[13,14] are a few examples of how they are utilized in the literature. Perceptions of day-to-day interaction with diverse patient populations were added to this literature review about possible healthcare curriculum applications. After participation in didactic instruction and a three-week intensive clinical outreach program, Victoroff et al. provided dental students with a written assignment to reflect on their interaction with diverse patients. Use of qualitative research to interpret the essays and their perspectives, key themes were present. Major themes included the students' development of cultural awareness, their desire to build rapport with their patients, and their realization that the development of cultural competence is a lifelong learning process.[15]

Perceptions of dental students' cultural competence are also noted when addressing the student's environment. A survey of dental school seniors assessing their perception of their cultural competency training's adequacy gives us a further insight into their day-to-day interactions with diverse patients.[16] Students acknowledged their environment playing a role in their ability to be prepared to care for diverse populations.[16] Special attention should be given to institutions that promote acceptance and respect, as their students' reported being prepared to care for diverse patients.[16] Students were also inclined to perceive the time devoted to cultural competency as inadequate if the school promoted acceptance and respect well.[16] The author's suggestion for this matter included, "incorporation of new culture-related content into the existing course would be more likely to succeed than the creation of new stand-alone courses on cultural issues."[16] Furthermore, both authors noted that a huge benefit from these findings would continue to enhance the development of cultural competence curricula.[15,16]

Supplementary information on healthcare students' self-reported levels of confidence in cultural competence will complete this section. Medical students' perceptions of their cultural competence with a specific population are added to this literature review to analyze the matter further. Students will be providers to a diverse population and will be expected to care for them. Looking at a specific population of interest will give further insight into healthcare students' perceptions and their ability to be culturally aware when providing treatment for a population facing health disparities. Sherrill et al. studied the perceptions of medical students' attitudes and beliefs towards Latino patients. Use of a cross-sectional survey design, three composite measures were reviewed: Latino knowledge, cultural competence, and comfort with Latino patients.[17] Spanish proficiency, having lived in a Spanish-speaking country, and social interactions with Latinos in the past year were predictive of cultural competency.[17] Although this study was only concerned with a specific population, consideration should be given to the authors' recommendations. The findings suggest that, the length of exposure is an important indicator for provider practice and perception.[17] The authors note that it may be a bit excessive when trying to allocate for the diverse population that they may provide. Their suggestion is to utilize a "cultural partner," where a medical student can be matched with a Latino patient-partner throughout their medical school career.[17] This model enables the student to increase their knowledge and awareness and be adapted according to geographic and population demographic needs.[17] Discernments of students' cultural competency authorizes educators, administrators, and fellow faculty to transform outdated courses. With the future of LEP patient pools on the rise, healthcare programs, and dental hygiene programs, will need to implement this event into a diverse platform for all students.

OVERVIEW OF LIMITED ENGLISH PROFICIENT PATIENTS

Demographics of Limited English Proficient Patients

As defined by the U.S. Census Bureau, a limited English proficient individual is older than five years old and reports speaking English less than "very well".[18] The population makes up approximately 9 million residents that speak English "not well" in 2018.[19] Residents that indicated they do not speak English at all makeup approximately four million residents.[19] In 2013, of the total foreign-born LEP population, 39% were from Mexico, followed by China, El Salvador, and Vietnam.[20] The predominant language spoken by both immigrant and US-born LEP individuals was Spanish. Also, 63% of the LEP population were compromised by Latinos.[20] Compared to English proficient individuals, LEP individuals were more likely to live in poverty and not graduate from high school.

Health Status of Latino/Hispanic Patients

Prevalence of periodontal disease, heart disease, and diabetes in Latino/Hispanic populations are included in this literature review to understand the target populations' health status. The frequency of periodontal disease, according to Hispanic/Latino backgrounds, resulted in significant variations. Central Americans and Cubans consistently had a higher prevalence of attachment loss.[21] The incidence of sites reading a 4 mm or 6 mm probing depth was highest among Mexicans.[21] Disparities were also noted, with men having a higher prevalence of periodontitis. Another study indicated tooth loss and caries incidence in Hispanic/Latino subgroups that noted variants as well. The overall prevalence of caries being present or filled was approximately 85%.[22] Root surface decay was more common in Cuban and Central American subgroups, while 57% of all the participants had at least one of their natural

teeth missing.[22] Cuban subgroups experienced more tooth loss than Mexican subgroups.[22] The use of multiple Latino/Hispanic backgrounds is significant to reiterate that Latino/Hispanics are not a homogenous group. Each group showed variations in age, education, and health-seeking behaviors.[21,22] Further studies are needed to assess their oral hygiene behaviors, limited English proficiency, and periodontal health effects.

Limited English Proficient patients also have higher levels of blood pressure and are common to these patients.[23] Management effects of hypertension and being an LEP patient are also associated.[23] Kim et al. further commented that this finding was also persistent with patients who use the Spanish questionnaire or an interpreter. This verdict further concludes that communication barriers and health disparities are seen in health-related diagnosis. Being an LEP patient poses a risk of not understanding the significance of their diseases. Management of medications and prognosis may be more challenging for LEP patients to understand. To improve hypertension outcomes in LEP patients, Kim et al. suggested using concordant language care and medical interpreters. Limitations to this study include discrepancies of individuals that over- and under-estimate their ability to communicate in English. Self-reported language usage will have to be studied in order to determine accuracy.

Lastly, diabetes has been studied in Hispanic/Latino populations due to the growing concern of Type 2 Diabetes in this population.[24] Genetic predispositions, insulin resistance, and obesity are all critical markers of Hispanic/Latino populations.[24] Combined with environmental and socioeconomic status, the Hispanic/Latino population is at risk for a diabetes diagnosis. Again, language is seen as a barrier. The inability to ask questions, verbalize important information, and attempt to have a physician-patient relationship is a consequence of not

speaking the physician's preferred language. The development of diabetes programs for Hispanic/Latino patients that suffer or are at risk for developing type 2 diabetes should be implemented. Educational tools, such as pamphlets or websites, have a positive effect on self-management measures.[24] Culturally and language-appropriate materials are needed for Spanish-speaking patients at higher risk of developing type 2 diabetes. The population of interest health status' is vital to consider when providing culturally competent care. As dentistry is a profession that intertwines with medicine, bridging the healthcare gap is needed to discuss cultural competency and treatment suggestions.

Preferences of Communication with Healthcare Professionals

Language concordance is essential for patients to communicate with healthcare professionals effectively. Health outcomes and quality of care had detrimental effects when language concordance was utilized.[3] Use of bilingual healthcare professionals were also seen to increase patient satisfaction, avoid treatment errors, and create a healthy patient-provider relationship.[3] To reduce possible errors, Timmins' suggests proficient language assessments before depicting a healthcare provider to be bilingual. A healthy patient-provider relationship is deemed sufficient when there is trust, communication, and empathy. A provider speaking the same language as their patient will enable such relationships to flourish. If there is no language concordance between the provider and patient, interpreters will help create a bridge between the two.

The three most common forms of interpreters are ad hoc interpreters, professional interpreters, and telephone interpreters.[3] LEP patients who perceive complex communication during an appointment are more likely to utilize a professional interpreter.[25] This was not the

case if the patient had some English proficiency and did not feel the need to utilize an interpreter if communication was straightforward and direct. Accessibility to an interpreter was another concern when deciding to utilize a professional interpreter. Furthermore, everyday concerns of LEP patients should be taken into consideration when offering an interpreter to a patient.

The use of ad hoc interpreters is common to use for both patients and providers.[23] Utilization of untrained bilingual people to come and interpret for a patient is seen as convenient and can also cause ethical dilemmas. The use of friends and family to interpret, or even faculty members, can lead to a breach of confidentiality for patients.[23] Lack of proper informed consent and the patient's involvement in deciding a treatment plan violate the patients' autonomy.[23] Use of children and other ad hoc interpreters should be avoided. Inappropriate disclosure of confidential information should only be discussed with professional interpreters that are trained. Ad hoc interpreters' utilization is an illegal act based on standards formed by the Civil Rights Act of 1964[26] and other healthcare institutions. A possible suggestion can be implementing a simple, standardized measure[27] in a clinical setting to identify LEP patients. This measure can help identify and provide appropriate interpreters for the patient if they so need. Both providers and patients can benefit from this assessment tool as representing a diverse set of providers are set to decline.

HEALTHCARE PROFESSIONALS' COMMUNICATION WITH LEP PATIENTS

Demographics of Diverse Dental Providers

The underrepresentation of diverse providers is large and growing.[28] Underrepresented groups of dentists are considered American Indian or Alaska Native, Black, and Hispanic or

Latino. The enrollment numbers for these groups are declining and fall short of the needs in a population.[28] Underrepresented dentists are crucial for the diversification of the workforce and the accessibility of minority patients. Approximately one-third of underrepresented minority dentists prefer to work with underserved populations and aspire to work in their cultural communities.[28] This finding reveals the need for more diverse dentists in the U.S. workforce that will allocate to meet their communities' needs. Crucial relationships and communication barriers may be met with the introduction of more diverse providers.

In particular, the Hispanic and Latino dentists workforce deals with a disproportioned share of dental care for minority and underserved communities.[29] The current workforces of Hispanic and Latino dentists are insufficient for the U.S. population.[29] These providers are crucial in the efforts to care for the oral needs of Hispanic communities. Looking at the Hispanic/Latino dentists' unique characteristics, they indicate that 45% of clinically active Hispanic/Latino dentists primarily treat underserved patients.[29] Furthermore, Hispanic/ Latino dentists are 58% more likely to accept public insurance. Approximately 1 in 5 of the patients they treat have a low health literacy rate or prefer to speak a different language (other than English).[29] The culture and commitment to these communicates must include awareness of their commitment to their communities. More emphasis should be placed on the dental school pipeline, and strategies should be developed to expand their student body.

A previous study conducted in 2007 evaluated the Latino dentists' supply in California. Clear findings indicated that Hispanic/Latino dentists were not represented concerning the Latino population in California.[30] The pipeline for supplying Latino dentists to the state was less than ideal compared to the increasing Latino population.[30] In this longitudinal study, Mertz et

al. also concluded that after 10 years there are insufficiencies in the Latino/Hispanic dentist supply.[29] The quality of care provided to the Latino populations includes the ability to speak Spanish, which is demonstrated with the tendency to practice in heavily Latino areas.[30] The Latino shortage previously studied in 2007[30] indicates the shortage is continuing. Access to care is seen as a massive concern for Spanish speakers.[30] In order to find a dentist who is linguistically and geographically accessible, the number of Hispanic/Latino providers needs to be proportionate to the population. Different strategies to help a population with a lack of linguistically accessible dental providers should be seen as a priority as their numbers continue to decrease while diverse patients continue to rise.

Efforts of Diversification

Efforts to increase diversity in the dental workforce have been stated in the literature.[28,30,31] A particular study outlining the outcomes of a dental postbaccalaureate program has tried to increase cultural competence and diversity in the dental school student population.[31] Their efforts were put on economically disadvantaged students and facilitated higher dental school acceptance rates than is seen in national enrollment data for the year. Conclusions for this study found that most dental students who enrolled in this program speak a second language in their practices, provide care for underrepresented minorities, and are more likely to accept Medicaid patients than most new independent dentists.[31] This study can guide future programs and sheds light on the long term outcomes of students' impact after graduation.

The shortage of underrepresented dentists, and especially Latino dentists[30], require more than increasing Latino enrollments. An effort to increase the cultural competency of non-

Latino dentists is a suggestion that may help combat the shortfall of Latino dentists.[30] This may help create access to services for Latino patients that need them. Latino providers in healthcare fields note that "cultural competence is a learned set of skills and attitudes, potentially available to anyone who invests the time to master them."[30] Being culturally aware of different patients and cultures will improve the dental care delivery system and address oral health care disparities.[29] Diversity becoming a core value will reduce structural disparities seen in dental schools and help improve dental education to deliver care to those in the greatest need.[29]

Another effort to diversify the dentist workforce is the use of foreign-trained dentists.[29] Additional training completed in a CODA-accredited dental school, for example, an international dentist program or other advanced standing programs, provides a foreign-trained dentist the licensure needed to practice in the United States.[28,32] This requirement means that many foreign-trained dentists will need to repeat dental school in some manner. Visa applications, competitive applications for limited openings, and high tuition rates for international students are barriers to foreign-trained dentists seeking licensure.[32] Kellesarian suggested dental programs should address unconscious bias in admission and create an environment for exchanging beliefs and ideas across cultures.[32] To tackle inclusivity, diversifying the student body and allowing international students to be accepted will help create culturally competent providers. Further studies should be conducted on improving access to care and reducing patient health disparities with the inclusion of diverse providers that match the population's needs. These strategies could provide relief for a population that needs oral care and appropriate communication as part of language concordant care.

Communication with LEP Patients

Proper use of communication methods for Limited English Proficient patients is imperative for provider-patient communication. A systematic review highlighted the use of language concordant care to be associated with better outcomes for these patients.[33] The results of these studies included perceived positive outcomes such as patient satisfaction, access to care, and self-perceived knowledge of treatment and diagnosis.[33] These positive outcomes were also related to improving their relationship with their providers and overall empowerment among patients. This study's limitations included not having a standardized assessment of clinician proficiency language to evaluate the degree of communication with the patient. The use of an assessment tool will help providers assess their language fluency and address the patient's concerns accordingly.

Improvement of care quality and access to care will be regarded as ineffective if barriers faced by LEP patients are not addressed. The use of interpreter services is used as an effort to address barriers to communication with LEP patients. A systematic review of professional interpreters noted that they are associated with an overall improvement of care for LEP patients.[34] Decrease in communication errors and increase in patient comprehensions are further findings that interpreter services work, if used accordingly.[34] Availability and use of interpreter services are other barriers that healthcare providers and patients deal with together. Training for these interpreters will need to be further evaluated to ensure quality information is being provided to the patient.

A study looking at the accessibility to interpreter services in U.S. dental schools noted that 84.8% of institutions have formal interpreter services to use with LEP patients while in the clinic.[35] Majority attempt to pair the patient with a provider that speaks the same language. If

no provider/interpreter is available, faculty and ad hoc interpreters will be utilized.[35] Approximately 100% of the participating dental schools listed Spanish as the most common primary language of LEP patients in their institution.[35] Further findings include that most respondents indicated that their students receive less than two hours of instruction in working with LEP patients.[35] Although they did believe that LEP patients receive quality care at their institutions[35], fewer than two hours of instruction is less than ideal. Simon et al. also noted that institutions that pair LEP patients with students who speak the same language might take away experiences working with LEP populations from other students. Having no experience with LEP patients poses a risk for dentists to resist treating these populations.[35] For dental education to evolve, culturally competent instruction and access to interpreter services are vital to produce culturally sensitive providers.

Dental student perceptions of utilizing interpreter services are necessary to address the growing concern of inadequate use. The third and fourth-year dental students responded that most of their dental school clinics lacked legal interpreter services.[36] A study by Simon et al[35] found that participants also stated their institution attempted to pair a provider who speaks the same language.[36] The difference is that if no formal interpreters were available, they would utilize a patient's ad hoc interpreters they knew personally.[36] Results for this study were consistent with the previous study by inadequate access to interpreter services and limited training in working with LEP patients provided.[36] Although most dental students responded they were prepared to treat LEP patients after graduation, some respondents did not intend to provide treatment for LEP patients in their practice.[36] Simon et al. further comment that although these responses may be outliers, the dental education system's failure is indicated

with these students. The legal obligation to serve LEP patients and lack of cultural competence are vital to address LEP populations' disparities.[36] Furthermore, dental schools will need to be proactive. Training to use an interpreter, for example, will help dental students gain confidence in managing a patient with limited English proficiency.

Perceptions of interpreters' experiences in dental clinics are needed to understand factors associated with the successful implementation of healthcare interpreters. Interpreters are obligated to provide a precise translation of every comment made by the patient and the provider.[37] This translation includes everything about health or unrelated to health. They must uphold and protect patient privacy while their responsibility is to the healthcare provider, not the patient.[37] A limitation to their profession is the need not to assume becoming an advocate for the patient and avoiding any direct communication with the patient.[37] Patients questioning the interpreter about medical advice when the provider is not around is essential for interpreters to avoid. Challenges mentioned by interpreters include the temptation to give advice or be an advocate for the patient.[37] What is unique to interpreting in dentistry[37], is the manual manipulation or usage of instruments/materials in the mouth that make it difficult for interpreters to translate. If patients suffer from pain, this may also make it difficult for an interpreter to translate correctly. Recommendations given from interpreters in dental clinics include: informing interpreters of the limitations of their role before translating, speaking directly to the provider and the patient about their role before the appointment begins, and advocating for the provider to speak to the patient (and vice versa) rather than the interpreter.[37] These suggestions will make boundaries, enhance communication, and help delegate the interpreter's legal obligations. It is stated in the literature that interpreter training

focuses more on medicine and less on dental medicine than other medical fields.[37] Administrators, students, and interpreters alike must work together to facilitate and advocate for proper communication to reduce disparities with LEP patients.

International Barriers when Communicating with LEP Patients

Barriers to communication in a multilingual dental setting are also apparent in other parts of the world.[38,39] Legal obligations regarding negligence are facilitated by proper communication with a patient. Lack of understanding the patient's explanation, obtaining a medical history, and gaining informed consent are all obstacles that dentists from Australia[38] and Canada[39] also have dealt with. Dentists working in private settings reported that the most common and satisfactory communication method with a non-English speaking patient was with informal interpreters.[38] Although they were skeptical about the accuracy of the translation, use of children as ad hoc interpreters, and the patient's privacy being exploited, many dentists failed to recognize the legal issues associated with ad hoc interpreters.[38] The use of ad hoc interpreters was less costly than hiring a formal interpreter, were convenient, and possibly seen as valuable to gain a patient's trust. Furthermore, respondents indicated that endodontics and attempting to explain calculus, bacteria, or toxins have resulted in the less complicated treatment being offered to patients.[38] Thoroughly explaining treatment options with formal interpreters are necessary to gain the patient's informed consent. Multicultural clinics in other parts of the world give us further insight into ad hoc interpreters' dangers and the legal consequences that may follow when negligence is a possibility.

Cultural differences associated with language barriers are a critical barrier to providing health care in the U.S[33], as well as Canada[39]. Language discordance being seen in other parts of

the world is added to this literature review to help identify further barriers. The use of an interpreter was also seen to be needed during patient visits. For many non-French speaking physicians, the appointment time is lengthened due to time-consuming strategies, including speaking slowly and repeating information.[39] Non-French speaking physicians noted having more difficulty bonding with their French patients and used English educational tools since French educational tools were scarce.[39] Similar to the use of ad hoc interpreters in the U.S[36], non-French speaking physicians were concerned about the lack of medical vocabulary to be translated.[39] Language barriers seen as a threat to physicians' confidence level played a part in the use of interpreters. Language concordance further alludes to proper communication strategies and the need for formal interpreters in private clinics that need to be implemented. As international healthcare professionals are also struggling with language concordant care, efforts should be placed on the possibility of teaching them a second language.

TEACHING A SECOND LANGUAGE TO A HEALTHCARE PROFESSIONAL

Current Implementation Strategies

Teaching a second language to a healthcare professional has been viewed in a few studies, with the majority being seen in the medical profession.[40–43] The lack of literature found for dental/dental hygiene programs teaching Spanish as a second language necessitates a study reviewing perceptions of program directors and students wanting to take such a course. A national survey of Spanish medical curriculum in U.S. Medical Schools provides readers an inside look at the implementation strategies utilized in these institutions. The survey, composed of 39 total questions, was distributed among the 132 medical schools listed as institutional members of the Association of American College's Group on Education Affairs.[40] Out of the 110 medical

schools that completed this survey, 66% reported that a Spanish medical curriculum was available at their school, with 32% of the schools that did not report a curriculum planned to implement one within the next two years.[40] This finding seems logical, as most of the literature findings has been discovered to incorporate a Spanish course as part of their curriculum.[40,41,44]

With 56% of the schools viewing the growing Spanish-speaking patient population and student interest as part of the reasons for implementation, eight schools reported that the curriculum was developed to "encourage cultural sensitivity or competency among the student body."[40] Although cultural competency is not an exact component to determine proficiency, language has been found to overlap with cultural behaviors.[1] Global linguistic competence education should be related to language and include cultural health beliefs, variations in health literacy, and communication errors caused by limited Spanish-speaking physicians.[45] Incorporation of correct usage of professional interpreters, lectures related to linguistic minority patient populations, and discussion of cultural health beliefs will help combine cultural competence and language.[45]

The type of courses offered varies. Some of the courses offered utilized interdisciplinary programs to take the course together [42], while other courses utilized their programs' students as part of the requirement to take a Spanish course[41,44,46]. The majority of the courses were taught in person[41,42,44,46], while another institution provided their course online [45]. The duration of the courses were also wide-ranging. Most were completed between one semester to approximately two years[41,45]. At the same time, an immersion program provided their course in 10 days (10 hours a day) with reinforcement classes offered the following year after completing the course[46]. Using the Rassias Method, which emphasizes speaking the language while using written work,

this particular course has demonstrated their students to learn Spanish sufficiently to communicate independently with patients.[46] Other courses offered throughout a more prolonged period had their students still gain Spanish conversational skills by the end of the course[46]. Further studies will need to be conducted to know if the duration of a course affects the ability to learn a new language and retain the language.

Of the schools that did not provide a Spanish medical curriculum, 32% reported student interest, and 12 schools planned to incorporate a curriculum in the future[40]. Barriers to implementation were seen in many studies as well. Lack of time in the curriculum for students was regarded as the primary significant obstacle. [40,42,44] With an already rigorous curriculum seen in healthcare programs, one can understand this obstacle. A further literature review has shown this obstacle as a determinant of students taking a medical language course.[42] The immersion experience had students complete mandatory 2-hour classes during business hours and had residents excused from other duties during class times.[46] Appropriate credit within the professional program of studies will need to be given importance, as only 62% of medical schools offer course credit.[40] Course credit offered and implementation in nursing curricula found that they could meet its language learning objectives.[41] Other possible implementation strategies are integrating a Spanish course in a healthcare curriculum to reduce cost and establish the need for such a course in order to get support from the administration.[47] With the lack of literature on Spanish medical courses in dental schools' curricula, supplementary studies need to be conducted to review this course's desire and need.

Methods of Teaching

Differences in teaching modalities have also been seen throughout the literature [40,41,44–46]. Approximately 60% of medical schools reported having a faculty member teach their course, while the minority had an outside company or a paid trained medical interpreter responsible for instruction.[40] In a Spanish language course offered for pharmacy students, an adjunct instructor in Spanish was hired to teach the course[44], while instructors of a Spanish nursing course were under the University's Department of Spanish and Portugese[41]. A separate Spanish for health care professions course was taught by a Hispanic studies faculty member specializing in a foreign language.[42] For the 60% of medical schools that report having a faculty member, further evaluation should be done to grasp their fluency levels in teaching a language course.

Implementation strategies for teaching a language course share many similarities, but also differences. Didactic instruction and student-to-student role-play were the main methods of instruction used for teaching Spanish [40–42,44,46]. Differences included utilizing standardized patients[42], cultural immersion trips[44], community outreach programs[13,40,44], and Spanish language clinic volunteering[44]. While some courses focused on teaching primary language and vocabulary development[46], other courses focused on teaching authentic contexts and genres relevant to their healthcare professions[41,42,44].

With 75% of medical schools reporting their students being used as interpreters, clinic opportunities were apparent.[40] Use of community outreach programs has been predominately used as an adjunct to facilitate their language skills in a predominately Hispanic/Latino patient population.[13,44] Students felt that utilization of these clinics made them confident in their "ability to care for and communicate with Spanish-speaking patients".[44] Cultural immersion trips were also seen as useful tools for the quality of the language instruction homestay

experience.[44] Use of a Spanish speaking standardized patient for interviewing purposes gave the students an added opportunity to use their Spanish skills in a more authentic setting while assessing their speaking abilities in real-time.[42] Further evaluation of different teaching modalities for use in a clinical setting should be studied. Teaching language concordant care comes in various languages. Geographic necessities for linguistic individuals are utilized for patient purposes. Although this literature review focuses mainly on language concordant care related to Spanish, teaching another language shows similarities and differences in the two.

Comparison of Teaching Another Language to Healthcare Professionals

Similarities of providing students with the development and necessary communication skills to support patient-provider interactions had significant similarities of courses teaching a second language.[48–50] A proposal for a course teaching Mandarin for nursing students utilized necessary vocabulary development, patient-nurse interactions, doctor-nurse interactions, and cultural differences as part of the course[48]. Similarly, an Arabic course for healthcare professionals utilized basic Arabic vocabulary, medical terminology, and emphasized interactions between patients and doctor[49]. Lastly, teaching Polish at the University of Illinois at Chicago was also proposed as a healthcare professional course. This course focused on the pronunciation of Polish, vocabulary, and fundamental patient-provider interactions as well.[50] These particular courses were proposed for the patients' demographic necessities and urged the need for languages for healthcare professionals to be implemented in various languages. Although the student learning outcomes focused on necessary communication skills to aid with patient-provider interactions, these courses were primarily offered as a beginner course. Further studies should investigate the need for other languages to be taught in specific

locations and the value put on these courses from instructors and students. As many of these courses are related to beginner-level courses, evaluation strategies are of utmost importance to deem a student bilingual.

Evaluation of Fluency Levels

Pre-course language proficiency evaluations are seen to be different between institutions. Approximately 21% of institutions required pre-course language proficiency evaluations, with most institutions utilizing oral and written exams as part of their post-course evaluation.[40] Variation of pre-course evaluations ranged from sufficient proficiency in Spanish[42] to intermediate or higher Spanish proficiency[44]. Evaluations throughout the semester were also seen. Students were assessed each week by group instructions utilizing oral and written examinations as part of the cultural immersion experience.[44] At the end of the trip, they were also given a letter grade for the student's language proficiency level. In the Spanish course for nursing, an evaluation was conducted throughout the semester by students participating in "pass-off" assignments.[41] These particular assignments contained an oral interview between students and then between the instructor and the student. The use of Clinical Cultural and Linguistic Assessment examinations, learner self-scoring, Spanish patient encounters, online clinical modules, and videotape encounters have all been used to evaluate post-course proficiency.[45]

Post-course evaluations have addressed the evaluation of fluency levels, but the "level of fluency that is necessary to avoid errors in communication other than a physician's primary one is unknown."[46] A particular study does note that immersion and reinforcement significantly improve residents' ability to speak Spanish, but warn that it does not guarantee error-free

communication between patient and doctor.[46] Another study noted that medical students who perceived their Spanish proficiency as low did not use interpreters and reported communicating with Spanish speaking patients.[4] Few institutions required language proficiency evidence before allowing their students to care for limited English proficient patients[40]. Further studies should be addressed to develop a standardized fluency measure for healthcare professionals.

Strategies have been introduced in the literature to incorporate courses that offer to study a new language. Usage of certified medical interpreters to help create interdisciplinary partnerships will help providers when language discordance is identified.[45] Interpreters can further help to provide feedback during didactic lessons or in clinical encounters as well. When explaining treatment plans, procedures, and informed patient consent, it will enable interpreters to be a necessary aid for providers. These interpreters or Spanish medical educators should test all students before starting the course to establish a base.[43] Starting the curriculum with health disparities and issues of safety and patient care of patients with limited English proficiency will help students understand the importance of communication and language barriers seen.[47] Enforcing post-course assessment of fluency, students will understand their limitations and ask interpreters' help when needed.[47] Lastly, teaching students to not rely on ad hoc interpreters and instead provide professional medical interpreters to decrease medical errors is very important.[47] Future studies should conduct reassessments of Spanish medical programs and validate pre-and post- proficiency assessments to help increase the quality of care.

RESEARCH GAP

To our knowledge, there are no existing studies that test the Spanish fluency level of dental/dental hygiene students. Because of this research gap there exists an opportunity to teach dental providers a second language and evaluate their fluency levels. Teaching a second language to a healthcare professional has been viewed in a few studies, with the majority being seen in the medical profession.[40] Out of the 110 medical schools, 66% reported that a Spanish medical curriculum was available at their school, with 32% of the schools planning to implement one within the next two years.[40] The lack of literature found for dental/dental hygiene programs teaching Spanish as a second language necessitates a study reviewing perceptions of program directors and students wanting to take such a course.

CONCLUSION

Language concordance and cultural competency were noted to coincide with each other. With the growing number of limited English proficient patients, specifically Hispanic/Latino patients, creating culturally competent providers is discussed. Communication barriers were seen to result in health disparities, treatment errors, and unattainable patient-provider relationships. Implementation of culturally competent care in a healthcare curriculum discussed strategies to enforce a diverse environment further. Training dental providers to correctly use formal interpreters and provide accessibility to patients require much work. Current accreditation standards demand dental students to be competent in efficient communication for all patient populations. Teaching a Spanish course to healthcare providers may result in culturally competent, language concordant care for this growing LEP patient population. To create culturally competent providers that demonstrate language concordant care, the study aims to understand dental hygiene program directors' and students' perceptions

of integrating a Spanish language course into their program. Specific research objectives to be addressed are:

1.) To understand dental hygiene program directors' and students' perceptions of integrating a Spanish language course into their program
2.) To identify how programs are currently preparing students to become culturally competent providers
3.) To determine opinions on taking a Spanish language course, using Spanish skills after graduation, and willingness to have the participants' Spanish formally evaluated by a professional translator are fundamental to this study

Chapter 2: Materials and Methods

METHODS

This study was considered exempt by the IRB (study number 2021E1028). This study is a survey based, cross-sectional analysis of the use of translators and language curriculum in dental hygiene programs. The purpose of this study was to understand dental hygiene program directors' and students' perceptions of integrating a Spanish language course into their program. In particular, opinions on taking such a course, using Spanish skills after graduation, and willingness to have their Spanish formally evaluated by a professional translator are fundamental to this study. The study's context was between both dental hygiene program and students alike to complete a survey instrument.

There is an absence of instruments that assess both dental hygiene students and program directors. Using two survey instruments that were used in previous research studies, enables this study to gather information on both the didactic and current clinical implications of Spanish language use and further insight into current translation services offered in the clinic. After careful consideration, the use of two survey instruments previously conducted in both medical and dental clinics were used for this study.[4,36] A section was borrowed from a study conducted by Simon, Hum, and Nalliah, while the other section of was burrowed from Yawman et al.

Additional questions and modifications were used to create two final instruments for the study participants. Independent variables in this research were the instrument survey questions, while dependent variables were the participant's answers. As there were two survey

instruments, implications on participation for either sample group affected the results' validity. Strategies to receive participation from dental hygiene students were met via an online social networking page where a URL link was sent.

SURVEY INSTRUMENTS

Using two separate survey instruments, participants provided the necessary data required to understand the perceptions of both dental hygiene directors and their students. Although there was not an available survey that helped understand the entirety of this study's analysis, the decision was to incorporate survey questions from previously used research studies[4,36]. Since there were two separate surveys given to the dental hygiene directors and their students, a combination of the surveys and the addition of other qualifying questions were added to gain depth in their perceptions.

Questions were analyzed based on the following criteria for program directors: current strategies of their educational curriculum, including LEP education/language, quality of care, current translator services in the clinic, and perceptions of wanting to integrate a Spanish language course in the program's curriculum. For dental hygiene students, criteria for the questions that were analyzed included: quality of care, current usage of Spanish in the clinic, formal evaluation of their Spanish speaking skills, LEP patient care, use of translations services in the clinic, and perceptions of needing/taking a Spanish language course if it were to be implemented into their program.

The first survey instrument has been previously used to explore the translation services across the U.S. dental school clinics.[36] The survey was sent to academic deans in the qualifying 62 CODA-accredited dental schools to distribute the survey to their students. The questions

related to this survey instrument included descriptions of the institution's policies and protocols on interpreter use, management of LEP patients in the student clinic, and current curricula implementation for LEP patient care.[36] Use of these questions from the survey instrument will be geared toward the current implementation strategies used to teach dental hygiene students proper LEP/language concordant care. Additional questions were added to focus on Spanish-speaking patients and providers, and the care that they receive and demonstrate in the clinic.

The second survey instrument was conducted to understand the use of Spanish by medical students/residents at a New York University Hospital.[4] Although this study focused on medical students/residents, the use of this study's survey instrument was modified to fit a dental hygiene program. Descriptions of how dental hygiene students report communication with Spanish-speaking patients and their desire to improve their language skills was the underlying focus for the use of these survey questions.[4] It is important to note that some questions were modified to ensure it fits with the demographics of the participants, and only dental hygiene students answered questions pertaining to use of Spanish in the clinic. Lastly, the incorporation of questions related to integrating a Spanish language course in the curricula were added to fully address the aim of the study.

The creation of an appropriate survey instrument that would gain insight into the perceptions of the study participants was done using previously incorporated surveys. These surveys acted as an outline that created questionnaires for the targeted survey participants. Additional questions and modifications were created to use in the surveys. To understand the perceptions of the study participants, changes were needed. The benefit of this approach was

to help create an in-depth survey that broadened the perceptions of the dental hygiene program directors and their students. The final version of the surveys will be shown in this research project as an additional resource for future studies.

PROCEDURES

Two separate survey instruments were used for the respective survey population to grasp current implementation strategies on education and clinical application fully. On October 2021, 327 emails were sent to CODA accredited dental hygiene programs. Dental hygiene directors were asked to relay a separate email that was geared toward dental hygiene students in their 2nd or final year of the program. A social media post was posted on Instagram and Facebook to gain more participation for dental hygiene students. A reminder/ final email was sent out end of November 2021.

PARTICIPANTS

Both dental hygiene directors and dental hygiene students in their final year were eligible to participate in the study. Since final year dental hygiene students are practicing in the clinic regularly, their inclusion was necessary. The first-year dental hygiene students were excluded from this study since they will most likely not be in the clinic when this survey instrument was distributed. Dental and other allied dental education programs were not included in this study since the aim of this study was geared toward dental hygiene education

SURVEY ADMINISTRATION

Survey administration was issued in the fall semester of 2021 to obtain current educational and clinical Spanish language usage in dental hygiene programs. To gain access to the dental hygiene program director populations, usage of email communication was used, and

contact information was obtained from ADHA's directory list and CODA website. The first email was sent out in early October 2021, with a follow-up email sent out two weeks later. To gain access to dental hygiene students, two options were presented. The first being to ask for permission from dental hygiene program respondents to pass the survey along to their students. The second option was using social media platforms to post a URL link to the study. For this research study we went ahead and posted on both Instagram and Facebook. A URL link was attached to the social media post. Lastly, use of follow up emails were used to motivate participation.

DATA ANALYSES

All data was entered into an electronic database after completing the questionnaire by the study's participants. Data was analyzed in SPSS 27. Descriptive statistics were then completed for each question. An independent samples t-test was used to compare student and program director responses. Additionally, a t-test was used to compare student and program directors' responses on certain topics. These topics included differences on LEP patients receiving the same quality of care as non LEP patients, feelings on lower quality of care with Spanish-speaking only patients compared to English-speaking patients and graduating students' ability to independently manage LEP patients. Both qualitative and quantitative results were used for this study. The use of a questionnaire was used due to its familiarity in research of language concordant care/LEP patients[4,36], accessibility to the study's participants, ease of creating quantitative and qualitative questions, and moderate reliability. To ensure the study's validity, each questionnaire's responses was verified against the database after the study period, and the responses were kept anonymous.

Chapter 3: Results

DENTAL HYGIENE STUDENTS' FINDINGS

DEMOGRAPHICS

Dental hygiene students at accredited dental hygiene programs were asked to participate in this survey. A total of 327 schools were eligible to complete this survey. Overall, there was a total of 161 responses. Of the 161 responses, only 119 of them were considered "full responses". Total admission in each dental hygiene licensure degree program had varying class sizes. Majority of the class sizes ranged from 11-25 students (62.2%) followed by 26-40 students (34.5%). All regions from United States were represented, though most respondents were in the South (27.7%) and the Midwest (21.0%).

INTERPRETATION SERVICES IN CLINIC

Among the responding dental hygiene students, 45.4% of them indicated they do not have formal interpreter services available on the clinic floor, 26.1% stated they are subscribed to interpreter services provided via phone/internet, and 10.1% they have formally trained interpreters that come to the clinic for patient appointments. For the most part, students are assigned through the same procedures as English-speaking patients (62.9%). Other programs noted they pair LEP patients with students who have indicated they speak the patient's primary language (21.8%). If there is not a student provider that speaks the primary language, students indicated they will either assign the patient randomly (52.9%), assign the patient to a student provider who can speak a similar language (16.0%), or other methods (5.0%). If a student does not have access to formal interpreter services on the clinic floor for the patient's primary

language, most often (49.6%) patients would bring an ad-hoc interpreter they knew personally (i.e., family member of friend). The second most common answer (38.7%) was the use of ad-hoc interpreters affiliated with the school (i.e., staff, other students, or faculty).

QUALITY OF CARE

Dental hygiene students reported on the quality of care that LEP patients receive compared to non-LEP patients in their clinic. With 10 being strongly agree and 0 being strongly disagree the mean prevalence was 7.68 with a standard deviation of 2.51. This finding states that dental hygiene students believe LEP patients do, in fact, receive the same quality of care as non-LEP patient in clinic. Also, when asked "when you graduate from your institution, you are adequately prepared to independently manage LEP patients", the mean prevalence was 5.24 with a standard deviation of 3.09. Dental hygiene students believe that when they graduate from their program, they may be prepared to independently manage LEP patients.

USE OF ALTERNATIVE TRANSLATORS

Approximately 30.3% of students indicated they only see Spanish-speaking patients less than once/month. When asked about Spanish-speaking only patients, 46.2% of the students noted that they do not believe they can communicate effectively for an entire clinical encounter (i.e., take a history, answer questions, and explain follow-up plans) without the use of an interpreter. The majority of students use an ad-hoc interpreter when seeing a Spanish speaking only patients (45.4%). When estimating the percentage of time, they use family or friends as an interpreter the mean percentage was 44.08% (SD 34.61). The mean percentage of the use of professional translational services (in person or by phone) was 24.18% (SD 28.96). This finding indicates that dental hygiene students utilize professional translational services less

than a quarter of the time. The mean percentage of the use of secretarial, colleagues, or other staff members was 22.14% (SD 21.82). Lastly, the mean percentage of the use of alternatives was 21.07% (SD 26.72). Some of the alternatives that they noted were themselves, Google translate, or nothing at all.

Among the responding dental hygiene students 63.0% of them indicated they would like to improve their Spanish language skills. This finding indicates that majority of the dental hygiene students use their Spanish skills in clinic and would like to improve them as well. When conversating with Spanish-speaking patients, 32.8% of the students can sometimes understand what they are saying, followed by 20.2% of students that indicated that they never understand what they are saying. Additionally, when seeing Spanish-speaking only patients, 24.4% of dental hygiene students indicated they never tried to attempt to use their "Spanish language skills to take a history and/or provide medical advice without the use of an interpreter. The use of family, friends, or other staff was specified by 46.2% of dental hygiene students. When asked "why have you used these people rather than a professional interpreter", approximately 28.6% of dental hygiene students indicate that family, friends, and other staff are adequate translators. The second most chosen answer was "waiting time for a translator is too long" (16.8%).

USE OF SPANISH IN THE DENTAL HYGIENE CLINIC

The ability of dental hygiene students to communicate in Spanish is rudimentary (33.6%), followed by none (30.3%) and conversational (6.7%). In general, dental hygiene students possibly (30.3%) feel that "Spanish-speaking only" patients receive a lower quality of care as compared to English-speaking patients. When asked "if Spanish language training was

provided during your training, would you consider participating in this type of program", 72.3% of students said "yes", followed by 18.5% stating "possibly". Additionally, 49.6% of students plan to use their Spanish language skills in a clinical setting after they complete the dental hygiene program. Majority of students would be willing to have their Spanish formally evaluated by a professional interpreter to assess their level of Spanish proficiency (44.5%).

INTEGRATION OF A SPANISH LANGUAGE COURSE

Of the responding dental hygiene students, 89.1% of them stated their program does not currently offer a Spanish language course. If their program did offer a language course, 75.6% of the hygiene students indicated they would choose Spanish. These students noted the reason they believe it would be fundamental for students to learn Spanish was due to majority of their LEP population speaking Spanish in the dental clinic and would also help students become culturally competent providers (56.3%). Lastly, 10.1% of students suggested that it would be useful to learn another language instead of Spanish because "majority of our LEP population does not speak Spanish in the dental clinic", followed by 5.0% of students indicating "students have other courses they should prioritize".

DENTAL HYGIENE DIRECTORS' FINDINGS

DEMOGRAPHCIS

Dental Hygiene directors at accredited dental hygiene programs were asked to participate in this survey. A total of 327 schools were eligible to complete this survey. Overall, there was a total of 54 responses. Of the 54 responses, only 34 of them were considered "full responses". Total admission in each dental hygiene licensure degree program had varying class sizes. Majority of the class sizes ranged from 11-25 students, although some respondents

indicated having 26-40 students in their class as well. All regions from the United States were represented, though most respondents indicated their programs were in the South (41.2%) and the Midwest (26.5%).

MEASURING LEP DATA

Directors responding to the survey indicated that majority do not measure limited English proficiency (LEP) data from their patients in the student clinic, with only 11.8% of responding programs stating they do measure this data. The directors estimated that the prevalence of teaching practice patients who are LEP patients ranged from 0 to 50%. The primary language of the LEP population at their student clinic was considered Spanish, followed by Chinese, Vietnamese, and Arabic.

RESOURCES/FORMAL INSTRUCTION AVAILABLE TO MANAGE LEP PATIENTS

Most of the directors indicated there are no resources available to use for managing LEP patients and no formal instruction (41.2%). Approximately 38.2% of hygiene directors did mention that there are resources, but no formal instruction. The number of hours that are used for formal instruction or training in managing LEP patients is around 0-2 hours (61.8%). The primary method of instruction that their institution utilizes to educate students on management of LEP patients are written content (43.5%), followed by lectures (39.1%), and hands on activities (11.8%).

INTERPRETATION SERVICES IN CLINIC

Among the responding hygiene directors, 58.8% of them indicated they do not have formal interpreter services available on the clinic floor, 11.8% stated they are subscribed to interpreter services provided via phone/internet, and 11.8% stated they have formally trained

interpreters that come to the clinic for patient appointments. Students are assigned through the same procedures as English-speaking patients (47.1%) while other programs pair LEP patients with students who have indicated they speak the patient's primary language (23.5%). If there is not a student provider that speaks the primary language, directors indicated they will either assign the patient randomly (52.9%), assign the patient to a student provider who can speak a similar language (8.8%), or other methods (8.8%). If a student does not have access to formal interpreter services on the clinic floor for the patient's primary language, most often (58.8%) patients would bring an ad-hoc interpreters they knew personally (i.e., family member or friend).

QUALITY OF CARE

The majority of the directors reported believing that LEP patients receive the same quality of care as non-LEP patients in their clinic. With 10 being strongly agree and 0 being strongly disagree the mean prevalence was 8.87 and standard deviation was 1.84. Also, when asked "once your students graduate from your institution, they will be adequately prepared to independently manage LEP patients", the mean prevalence was 5.90 with a standard deviation of 2.23. In general, dental hygiene directors do not think (50.0%) that "Spanish speaking only patients receive a lower quality of care as compared to English-speaking patients".

INTEGRATION OF A SPANISH LANGUAGE COURSE

Based on plans to integrate a language training course, majority of hygiene directors indicated they would choose Spanish (55.9%). When asked if they believed it would be fundamental for students to learn Spanish, directors stated majority of their LEP population spoke Spanish in the dental clinic (11.8%) and it would also help prepare students to become

culturally competent providers (5.9%). When asked why they believe it would be useful to learn another language other than Spanish, 14.7% indicated that majority of their LEP population does not speak Spanish in clinic. Approximately 82.4% of the responding directors do not have a program that currently offers a Spanish language course. Majority stated they did not plan to integrate a Spanish language course in the future (52.9%), 3 programs stated they would (8.8%), and 32.4% directors were unsure (32.4**%**). The responding directors also indicated that it would be "extremely unlikely" (52.9%) to accommodate a Spanish language into the existing curriculum, while 20.6% indicated that it would "somewhat likely". When asked to share some of the challenges in integrating a Spanish language course in your program, they stated "credit hours, full curriculum, or no faculty available" to make this a possibility.

COMPARISON OF DENTAL HYGIENE STUDENTS AND DIRECTORS' FINDINGS

An independent samples test was utilized to compare differences between opinions of dental hygiene directors and students on certain topics. These topics included differences on LEP patients receiving the same quality of care as non LEP patients, feelings on lower quality of care with Spanish-speaking only patients compared to English-speaking patients and graduating students' ability to independently manage LEP patients. The results indicated that there is a statistically significant difference in dental hygiene students and directors' opinions on LEP patients receiving the same quality of care as non-LEP patients in their dental hygiene clinic ($p=.008$). On a scale of 0-10 (10 being strongly agree) the mean prevalence of dental hygiene students was a 7.68, whereas the dental hygiene directors indicated an 8.87. Also, there is a statistically significant difference in these groups and their feelings towards "Spanish-speaking only" patients and them receiving a lower quality of care as compared to English-speaking

patients (p=.001). The students felt that Spanish-speaking only patients did not receive quality of care than the directors. Lastly, there is no difference in dental hygiene students and directors and how they feel about graduating students' ability to adequately be prepared to independently manage LEP patients (p=.178).

Chapter 4: Discussions

This chapter will discuss the research findings on dental hygiene students first and then the dental hygiene program directors next. To evaluate the research findings, we had to break down the discussion section into multiple parts to ensure we discussed all our findings. Lastly, recommendations were added to the end of this section to summarize our findings and elaborate on suggestions that we deemed appropriate for dental hygiene programs.

DENTAL HYGIENE STUDENTS

In order to demonstrate concordant care, the study aimed to understand the dental hygiene program students' perceptions of integrating a Spanish language course into their program. The definition of cultural competency from the CODA states that cultural competency is "having the ability to provide care to patients with diverse backgrounds, values, beliefs, and behaviors, including delivery to meet patients' social, cultural, and linguistic needs".[5] Linguistics needs are necessary for students to meet. These results indicate that dental hygiene students are interested in participating in a Spanish language course. With 72.3% of the students indicating "yes," students are willing and able to develop their Spanish language skills to serve a limited English proficient community.

As 63% of the LEP population are compromised by Latinos and Spanish being the second most spoken language in the United States[19], there is an opportunity for language concordant care to be used in areas where heavily Spanish-speaking patients live. Additionally, while more medical schools are beginning to incorporate a Spanish medical course into their curriculum[40], dentistry falls short. In particular, the Hispanic and Latino dentists workforce deals with a

disproportioned share of dental care for minority and underserved communities.[29] A different strategy to help a population with a lack of linguistically accessible dental providers should be a priority. Unfortunately, their numbers continue to decrease while diverse patients continue to rise.

This study indicated that students characterize their ability to communicate in Spanish as rudimentary (33.6%), stating that they can ask a few basic questions and understand simple responses. However, they do not believe they can communicate effectively for an entire clinical encounter to a "Spanish-speaking only" patient without the use of an interpreter (46.2%). As they are mainly assigned through the same procedures as English-speaking patients (47.1%), some students will have the opportunity to care for a limited English proficient patient. If they do not perceive they can communicate effectively, the students would most likely use an ad-hoc interpreter (i.e., family or friends) during their clinic session. This finding is similar to a previous study that reported that medical students would also use family or friends as interpreters if no official translators were available.[4] What is significant to note is that most students characterized their interpreters' services available on the clinic floor as absent (45.4%). This finding is dissimilar to a study examining interpreter services available in U.S. dental schools.[35] These respondents indicated having legal interpreter services available for some, but not all languages patients speak. The respondents who did not use professional translators indicated that wait time, believing that family or friends were adequate translators, and not knowing the clinic's translator services were reasons they would use ad-hoc interpreters.

In general, students possibly believe that "Spanish-speaking only" patients receive a lower quality of care than English-speaking patients (30.3%). When comparing dental hygiene

students and dental hygiene directors about "Spanish-speaking only patients" and English-speaking patients on the quality of care, it was noted that both groups had a statistically significant difference. The students felt that Spanish-speaking only patients did not receive a lower quality of care than dental hygiene directors. There is also a statistically significant difference in dental hygiene students and directors' opinions on LEP patients receiving the same quality of care as non-LEP patients in their dental hygiene clinic (p=.008). On a scale of 0-10 (10 being strongly agree), the mean prevalence of dental hygiene students was 7.68, whereas the dental hygiene directors indicated an 8.87. It is important to note that there are consistent results that program directors think LEP patients receive an equal quality of care, whereas students did not feel this way.

About 89% of the responding students indicated their program does not currently offer a Spanish language course. A similar study on academic deans at U.S. medical schools revealed that 66% of their schools had a Spanish medical curriculum. There are currently healthcare programs that implement a Spanish language medical curriculum. It is essential to value the vast difference in how dental programs are certainly not close to this percentage. When asked if their program offered a language course, 75% of the respondents chose Spanish. These students believe it is fundamental to learn Spanish because most of their LEP population speak Spanish in the clinic. Students also noted that it can help them become culturally competent providers. They also indicated they would use their Spanish language skills in a clinical setting after completing their dental hygiene program (49.6%).

The results suggest that dental hygiene students are interested in taking a Spanish language course if offered (72.3%) and are willing to have a professional interpreter evaluate

their Spanish to assess their Spanish fluency (44.5%). One of the reasons these students are interested in a Spanish language course is their demographic. With most of the respondents from the South, the survey respondents may feel the need to cater to the high number of Spanish-speaking individuals. It has been previously mentioned that students believe it would be fundamental to learn Spanish. The reasons were due to having the majority of their LEP population speaking Spanish in the dental clinic, which will help them become culturally competent providers. According to CODA, accreditation standards for graduating dental students must be competent in "providing care in diverse populations and proper interpersonal and communication skills".[5] Part of being culturally competent focuses on exchanging ideas and beliefs in one's native language. The study's results indicate that using language concordant care is already a common interest and necessity to learn for dental hygiene students.

Only integrating a Spanish language course into the dental hygiene curriculum cannot solve the ultimate health disparities that Spanish-speaking or limited English proficient patients face. As limited English proficient patients have a higher prevalence for periodontal disease, hypertension, and diabetes[21,23,24], students can help alleviate the communication barriers, but not all. Being an LEP patient poses a risk of not understanding the significance of their disease.[23] LEP patients cannot ask questions, verbalize important information, and cannot form a provider-patient relationship due to not speaking the provider's preferred language. In a study that views the disparities of LEP patients and hypertension, Kim et al. suggested using language concordant care and medical interpreters.

Lastly, proper use of communication methods for LEP patients is imperative for provider-patient communication. Provider-patient communication such as the use of language

concordant care, leads to patient satisfaction, access to care, and self-perceived knowledge of treatment and diagnosis.[33] Addressing the improvement of care quality and access to care will be regarded as ineffective if barriers faced by LEP patients are not addressed.

DENTAL HYGIENE DIRECTORS

The study aimed to understand the dental hygiene program directors' perceptions of integrating a Spanish language course into their program to demonstrate language concordant care. The 2020 CODA accreditation standards for graduating dental students include competence in providing care in diverse populations and proper interpersonal and communication skills.[5] Additionally, the revised 2019 Dental Hygiene Accreditation standard 2-15, states that dental hygiene graduates must be competent in "communicating and collaborating with other members of the healthcare team to support comprehensive patient care.[7] Achievement of this standard facilitates basic principles of culturally competent care, health literacy, and effective communications for all patient populations.[5]

Part of practical communication skills for all patient populations will require language concordant care. Noncompliance with language concordant care by institutions can affect federally funded programs. Laws and regulations that support and protect limited English proficient patients (LEP) are protected by the Joint Commission and Title VI of the 1964 Civil Rights Act. Guidelines for the Joint Commission specify that quality care stems from effective communication, cultural competence, and patient- and family-centered care.[9]

The dental hygiene curriculum is put in place for dental hygiene students to gain these practical communication skills and cultural competence. The ADEA Compendium of Curriculum Guidelines Allied Health Professionals emphasizes that cultural competency, "should be

embedded throughout the curriculum".[10] Additionally, these guidelines suggest that cultural competence should be used in clinical and preclinical dental hygiene clinics, for the care of special needs patients, ethics, and professionalism courses.[10] This study indicates that dental hygiene directors are interested in enhancing their students' linguistic communication skills by implementing a Spanish language course in the curriculum, but realistically incorporating one is extremely unlikely.

As previously mentioned, there is an opportunity for language concordant care to be used in areas where heavily Spanish-speaking patients live. It has also been mentioned that the Hispanic and Latino dentists workforce deals with a disproportioned share of dental care for minority and underserved communities.[28] Dental hygiene programs directors will be required to accommodate this growing Spanish-speaking community in new ways.

This study indicated that 87.5% of the dental hygiene programs do not offer a Spanish language course. There is a vast difference compared to medical schools that incorporate a Spanish medical course in their curriculum. Approximately 66% of the medical schools reported that a Spanish medical curriculum was available at their school when the survey was completed.[40] Additionally, 32% of the medical schools that did not have a Spanish medical curriculum planned to incorporate one in the next two years.[40] For dental hygiene directors, only three respondents indicated they planned to integrate a Spanish language course in the future. These dental hygiene schools' efforts to address the growing need for Spanish language skills among dental hygiene students are unimpressive.

Approximately 88% of the dental hygiene directors stated that Spanish is the most frequently used primary language of their LEP patient population in the clinic. Most students

are assigned to LEP patients through the same procedures as English-speaking patients. If no student providers speak the preferred language, LEP patients will be assigned randomly to students. Appropriate use of interpreter services addresses barriers to communication with LEP patients. As for the translation services available on the clinic floor, most reported they do not have legal interpreter services (58.8%). This finding contrasts with a study that views the access to interpreter services at U.S. dental schools. In this study, 15.2% of the participants indicated they do not have formal interpreter services on the clinic floor. In this study, 58.8% of the respondents revealed that patients could bring an ad-hoc interpreter they know personally if the student does not have access to formal interpreter services on the clinic floor. Ad hoc interpreters are standard practice for both patients and providers.[23] It is important to note that the use of friends and family to interpret, or even faculty members, can lead to a breach of confidentiality for patients.[23] Lack of proper informed consent and the patient's involvement in deciding a treatment plan violate the patients' autonomy.[23] It will be imperative for these dental hygiene directors to comply with the laws and regulations that support and protect LEP patients, such as the Joint Commission and Title VI of the 1964 Civil Rights Act. Failure to comply with these regulations can result in legal consequences and affect federally funded programs.

Providing LEP patients the opportunity to exchange ideas with their providers leaves an opportunity for dental hygiene students to learn the patients' language. Speaking the same language as a patient introduces language concordant care. To effectively introduce language concordant care, cultural competence is imperative to learn for this growing community. Managing LEP patients may only be a part of cultural competence but is vital for students to

know. Regarding formal instruction or resources available for dental hygiene students to manage LEP patients, most dental hygiene directors indicated there are resources available but no formal instruction (38.2%). Approximately 0-2 hours of formal instruction or training in managing LEP patients will have had by the time they graduate from their dental hygiene program (87.5%). The primary method of instruction the dental hygiene program utilizes to educate patients on the management of LEP patients is either written content or lectures. This finding is similar to another study that indicates 83% of the hygiene program directors rely on lectures to introduce cultural competency concepts.[12] Additionally, when asked if they believe their students will be adequately prepared to manage LEP patients independently, most dental hygiene directors indicated a score of 5.90 out of 10. This finding suggests they are on the fence about their student's capabilities.

Over half of the responding dental hygiene directors do not feel that "Spanish-speaking only" patients receive a lower quality of care than English-speaking patients. When comparing dental hygiene students and dental hygiene directors about "Spanish-speaking only patients" and English-speaking patients on the quality of care, it was noted that both groups had a statistically significant difference. The students felt that "Spanish-speaking" only patients did not receive a lower quality of care than dental hygiene directors. There is also a statistically significant difference in dental hygiene students and directors' opinions on LEP patients receiving the same quality of care as non-LEP patients in their dental hygiene clinic (p=.008). On a scale of 0 to 10 (10 being strongly agree), the mean prevalence of dental hygiene students was 7.68, whereas the dental hygiene directors indicated 8.87. It is important to note that there

are consistent results that program directors think patients that are either "Spanish-speaking only" or LEP patients receive an equal quality of care, whereas students did not feel this way.

If their program were planning to integrate a language training course, most would choose Spanish. Also, most of the respondents indicated that it would be fundamental for students to learn Spanish because it will help prepare their students to become culturally competent providers (35.3%). The majority of the LEP population speaks Spanish. When asked how likely it will be to accommodate a Spanish language course in the existing curriculum, most answered "extremely unlikely" (52.9%). The common themes that were present when asked to explain the challenges in integrating a Spanish language course included: an already packed curriculum, no time, and no formal faculty to teach the course. One hygiene director mentioned that their program had wanted to integrate the Spanish language into the course, but their curriculum committee denied their request. Although it was the primary language of their LEP patient population, the committee "did not feel comfortable incorporating a course that just focused on one language."

A big part of cultural competency is the improvement of students' attitudes of prejudices or biases towards other cultures.[12] As previously mentioned, the majority of the dental hygiene directors are on the fence about their student's capabilities to independently manage LEP patients but do not feel that Spanish-speaking patients receive a lower quality of care than English-speaking patients. With the growing number of Spanish-speaking LEP patients, dental hygiene directors will be forced to accommodate this community in other ways. Even though they are interested in enhancing their students' linguistic communication

skills by implementing a Spanish language course in the curriculum, it is improbable they can incorporate one in the dental hygiene curricula.

STUDY LIMITATIONS

DENTAL HYGIENE STUDENTS

There are several limitations to this study. First, the number of respondents to the survey's instrumentation tool is low. Of the recorded 161 Students that completed the survey, only 119 provided total responses. Although social media methods incentivized final-year dental hygiene students to take the survey, we cannot be certain that they were in fact dental hygiene students that completed the survey. Second, not all dental hygiene programs cater to Spanish/Hispanic populations. Some responses indicated they never needed to translate to Spanish-speaking individuals. These outliers are mentioned to let readers know that few respondents did not want to take a Spanish language course. Other languages that they were interested in included ASL, Mandarin, and French. Lastly, only final-year dental hygiene students were eligible to participate in this survey. Since we sent out this questionnaire in the fall semester, the first-year dental hygiene students were not eligible since they have no clinical experience.

DENTAL HYGIENE DIRECTORS

There are limitations to this study. The first is that the number of respondents to the survey's instrumentation tool is low. Of the 54 dental hygiene directors who completed the study, only 34 provided total responses. Lastly, not all dental hygiene programs cater to Spanish/Hispanic populations. Some responses indicated they never needed to translate for Spanish-speaking individuals.

RECOMMENDATIONS FOR DENTAL HYGIENE PROGRAMS

For programs that cannot accommodate a Spanish language course at this time, we offer a few alternatives. Training to use an interpreter, for example, will help dental hygiene students gain confidence in managing a patient with limited English proficiency. The use of ad-hoc interpreters (i.e., family and friends) can come with legal consequences if the patient's privacy is being exploited. Lack of proper informed consent and the patient's involvement in deciding a treatment plan violates the patient's autonomy.[23] Additionally, the accuracy of the translation is in jeopardy when using ad-hoc interpreters. If a student can use an interpreter effectively, they can make boundaries, enhance communication, and help delegate the interpreter's legal obligation.

Creating more time in the curriculum to learn about cultural competency will be necessary. Lectures related to linguistic minor patient populations and discussions of cultural health beliefs will help combine cultural competence and language.[45] A study that utilized a "cultural partner," where a medical student matched with a Latino patient-partner throughout their medical school career enabled the student to increase their knowledge and awareness. This immersion type can be adapted according to geographic and population demographic needs.[17] Lastly, community outreach programs and cultural immersion trips have been predominately used as adjuncts to facilitate their language skills in Hispanic/Latino patient populations.[13,45] Students that have participated in these trips have expressed they have felt confident in their "ability to care for and communicate with Spanish-speaking patients".[44]

The proper resources will need to be used when programs can implement a Spanish language course or any language course. The instructor teaching the course should be either from an outside company, a paid trained medical interpreter responsible for instruction, or a Hispanic studies faculty member specializing in a foreign language. Both pre- and post-proficiency evaluations are needed to address the evaluation of fluency levels. A particular study does note that immersion and reinforcement significantly improve students' ability to speak Spanish but warn that it does not guarantee error-free communication between patient and doctor.[46]

RECOMMENDATIONS FOR FUTURE STUDIES

More research is needed to determine which language would be best suited for clinicians to learn according to their demographics and the effectiveness of teaching a language with just one course. In addition, more research is needed to determine how dental hygiene programs can implement a language course in their curriculum. Also, research should focus on the already implemented language curriculums in other healthcare programs to use as a reference. Future research should include dentistry and its development of culturally competent providers using language concordant care. Finally, the study should consist of all dental and dental auxiliary program directors/students to broaden the demographics and perceptions of this population.

CONCLUSION

This is the first study that has looked at the perceptions of dental hygiene students and program directors and the integration of a Spanish language course into the dental hygiene curriculum. Our findings with this study suggest that dental hygiene students are interested in

taking a Spanish language course, and many even consider it fundamental for their cultural competence. Additionally, dental hygiene directors are interested in enhancing their students' linguistic communication skills by implementing a Spanish language course in the curriculum, but realistically incorporating one is extremely unlikely. Students can help alleviate the communication barriers by using concordant language care, but not all. State legislatures and a credit max on associate degree programs will make it challenging to incorporate a language course. Because of the challenges in integrating a Spanish language course into the dental hygiene curriculum, dental hygiene directors will be forced to accommodate the growing Spanish-speaking community in other ways.

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Appendix A. List of Figures

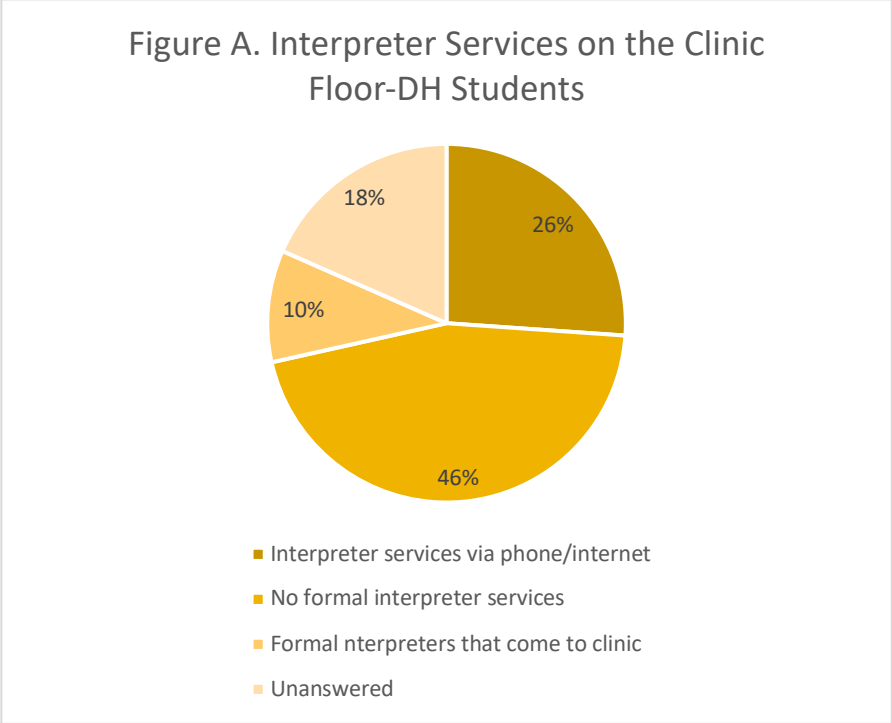


Figure B. Interpreter Services on the Clinic Floor-DH Directors

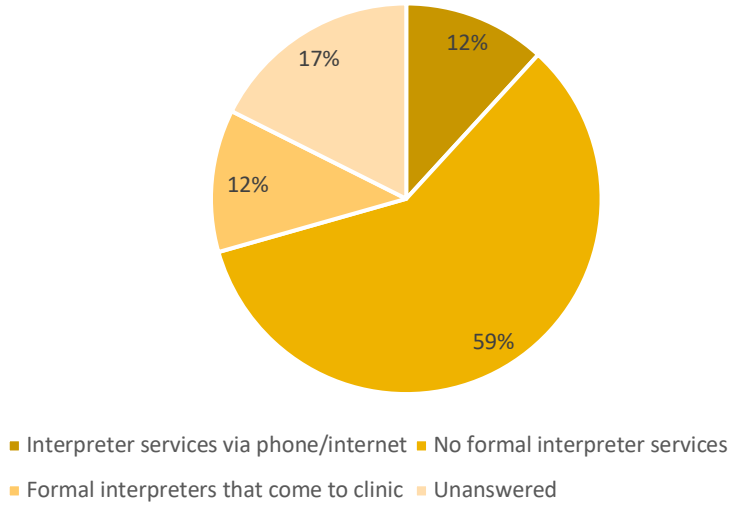


Figure C. No Formal Interpeter Services are Available: What to do (DH Directors)

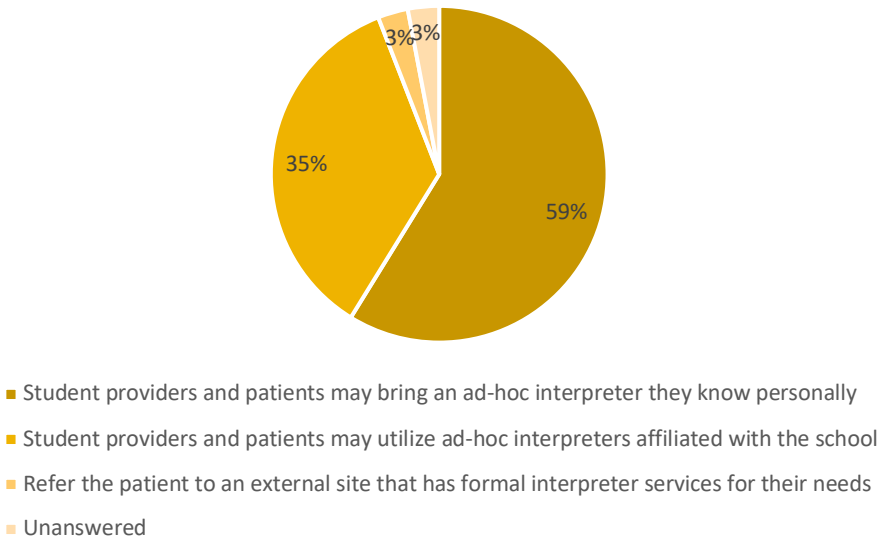
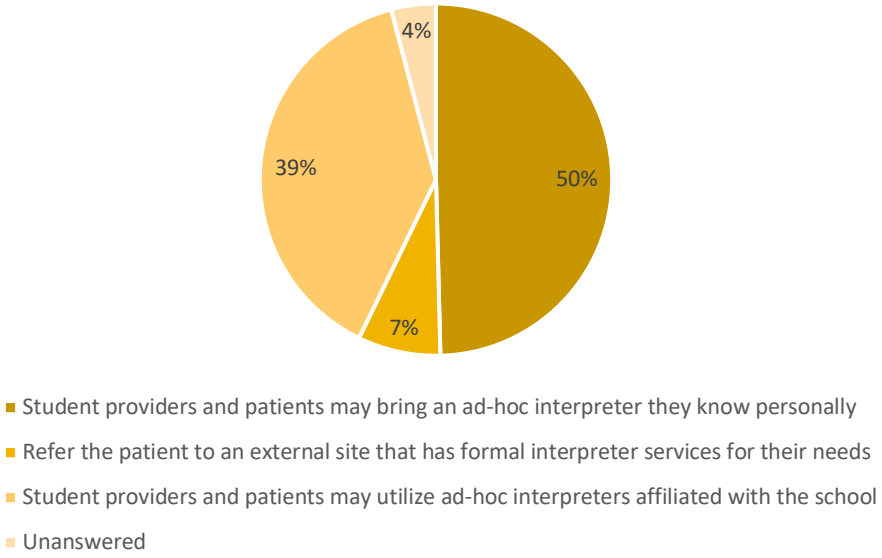


Figure D. No Formal Interpeter Services are Available: What to do (DH Students)



Appendix B. List of Tables

Table 1. Demographics of Survey Respondents (DH Directors)	N (%)
What region is your school located in?	
Northeast	3 (8.8%)
Midwest	9 (26.5%)
South	14 (41.2%)
West Coast	2 (5.9%)
Southwest	
How many students are admitted in each dental hygiene licensure degree program cohort? (How many students per class)	
<10	0
11-25	23 (67.6%)
26-40	9 (26.5%)
41-100	2 (5.9%)

Table 2. Demographics of Survey Respondents (DH Students)	N (%)
What region is your school located in?	
Northeast	12 (10.1%)
Midwest	25 (21.0%)
South	33 (27.7%)
West Coast	21 (5.9%)
Southwest	2 (1.7%)
How many students are admitted in each dental hygiene licensure degree program cohort? (How many students per class)	
<10	2 (1.7%)
11-25	74 (62.2%)
26-40	41 (34.5%)
41-100	2 (1.7%)

Table 3. Limited English Proficiency (LEP) Data (DH Directors)	N (%)
Do you measure LEP data from your patients in the student clinic?	
Yes	4 (11.8%)
No	27 (79.4%)
Unsure	3 (8.8%)
What are the three languages that are most frequently the primary language of LEP patient population?	
Spanish	30 (88%)
Chinese (Mandarin)	8 (23.5%)
Arabic	3 (8.82%)
What is the PRIMARY method of instruction that your institution utilizes to educate students on management of LEP patients?	
Written content (provide materials and other resources to use)	10 (29.4%)
Lectures (provide education information in class)	9 (26.5%)
Hands on (provide opportunities to practice interactions and receive feedback)	4 (11.8%)
Unanswered	11 (32.4%)
How are LEP patients assigned to students?	
They are assigned through the same procedures as English-speaking patients	16 (47.1%)
We pair LEP patients with students who have indicated they speak the patient's primary language	8(23.5%)
Unanswered	10 (29.4%)
If no student provider speaks that primary language, how are LEP patients assigned?	
They assign the patient randomly	18 (52.9%)
We assign the patient to a student provider who can speak a similar language	3 (8.8%)
Unanswered	35 (8.8%)

Table 4. Integrating a Spanish Course into the Curriculum (DH Directors)	N (%)
If your program plans to integrate a language training course, which language would you choose?	
Spanish	19 (55.9%)
Other	2 (5.9%)
Unanswered	13 (38.2%)
Why do you believe it would be fundamental for students to learn Spanish?	
Majority of our LEP population speak Spanish in the dental clinic	4 (11.8%)
Help prepare students to become culturally competent providers	2 (5.9%)
All of the above	12 (35.3%)
Unanswered	16 (47.1%)
Does your program currently offer a Spanish language course?	
No	28 (82.4%)
Yes	4 (11.8%)
Unanswered	2 (5.9%)
In the future, does your institution plan to integrate a Spanish language course?	
No	18 (52.9%)
Yes	3(8.8%)
Unsure	11 (32.4%)
Unanswered	2 (5.9%)
How likely is your program able to accommodate a Spanish language course into the existing curriculum?	
Extremely unlikely	18 (52.9%)
Somewhat unlikely	3 (8.8%)
Neither likely nor unlikely	3 (8.8%)
Somewhat likely	1 (2.9%)
Extremely likely	1 (2.9%)
Unanswered	2 (5.9%)

Table 5. Use of Spanish in Clinic (DH Students)	N (%)
How are LEP patients assigned to you?	
They are assigned through the same procedures as English-speaking patients	56 (47.1%)
They pair LEP patients with students who have indicated they speak the patient's primary language	26 (21.8%)
Unanswered	7 (5.9%)
If no student providers speak that primary language, how are LEP patients assigned to you?	
They assign the patient randomly	63 (52.9%)
They assign the patient to a student/provider who can a speak a similar language	19 (16.0%)
Other	5.0%)
Unanswered	31 (26.1%)
What are the interpreter services that are available on the clinic floor?	
Formally trained interpreters	12 (10.1%)
Interpreter services provided via phone or internet	31 (26.1%)
No formal interpreter services available	54 (45.4%)
Unanswered	22 (18.4%)
Do you ever use an interpreter (family, friends, staff, or professional translation services) when seeing a "Spanish-speaking only" patient?	
Yes	54 (45.4%)
No	32 (26.9%)
Unanswered	33 (27.7%)
Would you like to improve your Spanish language skills?	
Yes	75 (63.0%)
No	7 (5.9%)
Unanswered	37 (31.1%)
Do you plan on using your Spanish language skills in a clinical setting after you complete the dental hygiene program?	
No	12 (10.1%)
Possibly	28 (23.5%)
Yes	59 (49.6%)
Unsure	16 (13.4%)
Unanswered	4 (3.4%)
Would you be willing to have your Spanish formally evaluated by a professional interpreter to assess your level of Spanish proficiency?	
No	26 (21.8%)
Possibly	29 (24.4%)
Yes	53 (44.5%)
Unsure	8 (6.7%)
Unanswered	3 (2.5%)

Table 6. Integration of a Spanish Language Course (DH Students)	N (%)
Does your program currently offer a Spanish language course?	
No	106 (89.1%)
Yes	5 (4.2%)
Unsure	5 (4.2%)
Unanswered	3 (2.5%)
If your program offered a language course, which language would you choose?	
Spanish	90 (75.6%)
French	5 (4.2%)
Mandarin	5 (4.2%)
Other	13 (10.9%)
Unanswered	6 (5.0%)
Why do you believe it would be fundamental for students to learn Spanish?	
Majority of our LEP population speak Spanish in the dental clinic	7 (5.9%)
Help prepare students to become culturally competent providers	16 (13.4%)
All of the above	67 (56.3%)
Unanswered	29 (24.4%)

Appendix C. Questionnaire for Dental Hygiene Directors

1. How many students are in each class at your institution?
    a. <40
    b. 81-120
    c. 121-160
    d. 161-200
    e. 201+
2. Please select the region that your school is located in:
    a. Northeast
    b. Midwest
    c. South
    d. West Coast
    e. Southwest
3. Do you measure Limited English Proficiency (LEP) data from your patients in the student clinic?
    a. Yes
    b. No
    c. Unsure
4. What is your estimation of the percentage of teaching practice patients who are Limited English Proficiency (LEP) patients?
    a. _____
5. Please indicate the three languages that are most frequently the primary language of your LEP patients
    a. _____
    b. _____
    c. _____
6. Is there formal instruction or resources available for dental students (via lectures, videos, reading material, seminars, hands-on practice) in managing limited English proficiency (LEP) patients?
    a. Yes (there is formal instruction and resources available)
    b. Yes (there is formal instruction)
    c. Yes (there are resources available but no formal instruction)
    d. No (skip logic here to skip to next question)
7. About how many hours of formal instruction or training in managing LEP patients will you have had by the time they graduate from your institution?
    a. 0-2 hours
    b. 2-4 hours
    c. 4-6 hours
    d. 6-8 hours
    e. 8-10 hours
    f. 10-12 hours

g. 12-14 hours
h. More than 14 hours

8. What is the PRIMARY method of instruction that your institution utilizes to educate students on management of LEP patients? (only one answer is selected)
    a. Written content (provide materials and other resources to use)
    b. Lectures (provide education information in class)
    c. Hands on (provide opportunities to practice interactions and receive feedback)
9. Which statement best describes how LEP patients are assigned to you?
    a. They are assigned through the same mechanisms as English-speaking patients
    b. We pair LEP patients with students who have indicated they speak the patient's primary language
    c. Other: _____
10. If no student providers speak that primary language, how are LEP patients assigned?
    a. They assign the patient randomly
    b. We assign the patient to a student provider who can speak a similar language
    c. Other: _____
11. Which statement best describes the interpreter services that are available on the clinic floor?
    a. We have formally trained interpreters employed by our institution that we can request for appointments
    b. We subscribe to interpreter services provided via phone or internet via programs like IPOP that are available in the clinic
    c. We do not have formal interpreter services available
12. If the student provider and patient do not have access to formal interpreter services on the clinic floor for the patient's primary language?
    a. Patients may bring an ad-hoc interpreter they know personally (i.e. family member or friend)
    b. Student providers and patients may utilize ad-hoc interpreters affiliated with the school (i.e., staff, other students, faculty)
    c. We refer the patient to an external site that has formal interpreter services for their needs
    d. Other: _____
13. In your opinion, do LEP patients receive the same quality of care as non-LEP patients in your teaching practices?
    1—2—3—4—5—6—7—8—9—10
    Strongly agree strongly disagree
14. When students graduate from your institution, they are adequately prepared to independently manage LEP patients
    1—2—3—4—5—6—7—8—9—10
    Strongly agree strongly disagree
15. In general, do you feel that "Spanish-speaking only" patients receive a lower quality of care as compared to English-speaking patients
    a. No

b. Possible
c. Yes
d. Unsure

16. If your program plans to integrate a language training course, which language you would choose?
    a. Spanish
    b. French
    c. Mandarin
    d. Other (please note): _____
17. If your answer to the previous question was Spanish (if not, skip to question #20), why do you believe it would be fundamental for students to learn Spanish?
    a. Majority of our LEP population speak Spanish in the dental clinic
    b. To help integrate cultural competency in our curriculum
    c. Help prepare students to become culturally competent by graduation
    d. All the above
18. If your answer to the previous question was NOT Spanish, why do you believe it would not be useful for students to learn?
    a. Majority of our LEP population does not speak Spanish in the dental clinic
    b. Students have other courses they should prioritize
    c. The interpreter services that are provided in our institution will not make Spanish a priority to learn for our students
    d. Other (please note):
19. Does your program currently offer a Spanish language course?
    a. No
    b. Yes
    c. Unsure
20. In the future, does your institution plan to integrate a Spanish language course?
    a. No
    b. Yes
    c. Unsure
21. How likely is your program able to accommodate a Spanish language course into the existing curriculum?
    a. Not likely
    b. Very likely
    c. Unsure
22. What are some of the challenges to integrating a Spanish language course in your program?
    a. _____

Questionnaire for Dental Hygiene Students

1. How many students are in each class at your institution?
    a. <40
    b. 81-120
    c. 121-160
    d. 161-200
    e. 201+
2. Please select the region that your school is located in:
    a. Northeast
    b. Midwest
    c. South
    d. West Coast
    e. Southwest
3. Which statement best describes how Limited English Proficient (LEP) patients are assigned to you?
    a. They are assigned through the same mechanisms as English-speaking patients
    b. We pair LEP patients with students who have indicated they speak the patient's primary language
    c. Other: _____
4. If no student providers speak that primary language, how are LEP patients assigned?
    a. They assign the patient randomly
    b. We assign the patient to a student provider who can speak a similar language
    c. Other: _____
5. Which statement best describes the interpreter services that are available on the clinic floor?
    a. We have formally trained interpreters employed by our institution that we can request for appointments
    b. We subscribe to interpreter services provided via phone or internet via programs like IPOP that are available in the clinic
    c. We do not have formal interpreter services available
6. If the student provider and patient do not have access to formal interpreter services on the clinic floor for the patient's primary language?
    a. Patients may bring an ad-hoc interpreter they know personally (i.e. family member or friend)
    b. Student providers and patients may utilize ad-hoc interpreters affiliated with the school (i.e., staff, other students, faculty)
    c. We refer the patient to an external site that has formal interpreter services for their needs
    d. Other: _____
7. In your opinion, do LEP patients receive the same quality of care as non-LEP patients in your teaching practices?
8. 1—2—3—4—5—6—7—8—9—10

Strongly agree strongly disagree

9. When students graduate from your institution, they are adequately prepared to independently manage LEP patients
   1—2—3—4—5—6—7—8—9—10
   Strongly agree strongly disagree
10. Do you believe that you can communicate effectively for an entire clinical encounter (take a history, answer questions, and explain follow-up plans) to a "Spanish-speaking only" patient **without** the use of a translator?
    a. No
    b. Occasionally
    c. Most of the time
    d. Always
11. How often do you see patients that are "Spanish-speaking only" in your institution?
    a. Never
    b. Less than once/month
    c. Monthly
    d. Weekly
    e. More than once/week
12. Do you ever use a translator (family, friends, staff, or professional translation services) when seeing a "Spanish-speaking only" patient?
    a. Yes
    b. No (if you answered "no" please skip to question 20)
13. Please estimate the **percentage** of time that you use each of the following groups of people to translate for a "Spanish-speaking only" patient (the responses should total 100%)
    a. __% people in the room with the patient (family or friends)
    b. __% professional translation services (in person or by phone)
    c. __% secretarial, colleagues, or other staff members
    d. __% other (specify)
    e. 100%
14. Would you like to improve your Spanish language skills?
    a. Yes
    b. No
15. When patients speak Spanish to you, do you understand what they are saying?
    a. Never
    b. sometimes
    c. about half the time
    d. Most of the time
    e. Always
16. When seeing patients who are "Spanish-speaking only," how often have you attempted to use **your** Spanish language skills to take a history and/or provide medical advice directly to a "Spanish-speaking only" patient **without** the use of a translator (family, friends, staff, or professional translation services)?

a. Never (I always use a translator)
b. Rarely
c. Sometimes
d. Frequently
e. Always (I never use a translator)

17. Have you ever used family, friends, or other staff to translate in the student clinic setting?
    a. Yes-if yes then why have you used these people rather than a professional translator?
        i. Check all that apply:
            1. Waiting time for a translator is too long
            2. Family, friends, and other staff are adequate translators
            3. Family preference
            4. Other (please note) _____
    b. No (go to question 19)
18. How would you characterize your ability to communicate in Spanish?
    a. None
    b. Rudimentary-able to ask a few basic questions, and understand simple responses
    c. Conversational-able to have a two-way medical conversation with a patient (take a history, and give medical advice without the assistance of a translator)
    d. Fluent
19. In general, do you feel that "Spanish-speaking only" patients receive a lower quality of care as compared to English-speaking patients
    a. No
    b. Possible
    c. Probably
    d. Yes
    e. Unsure
20. If individual Spanish language training were provided during your training, free of charge, would you consider participating in this type of program?
    a. No
    b. Possibly
    c. Yes
    d. Unsure
21. Do you plan on using your Spanish language skills in a clinical setting after you complete the dental hygiene program?
    a. No
    b. Possibly
    c. Yes
    d. Unsure
22. Would you be willing to have your Spanish formally evaluated by a professional translator to assess your level of Spanish proficiency?
    a. No

b. Possible
c. Probably
d. Yes
e. Unsure

23. Does your program currently offer a Spanish language course?
    a. No
    b. Yes
    c. Unsure
24. If your program currently offered a Spanish language course, would you enroll?
    a. No
    b. Yes
    c. Unsure
25. If your program offered a language course which language you would choose?
    a. Spanish
    b. French
    c. Mandarin
    d. Other (please note): _____
26. If your answer to the previous question was Spanish, why do you believe it would be fundamental for students to learn Spanish?
    a. Majority of our LEP population speak Spanish in the dental clinic
    b. To help satisfy cultural competency requirements for graduation
    c. Help prepare students to become culturally competent providers
    d. All the above
27. If your answer to the previous question was NOT Spanish, why do you believe it would not be useful for students to learn?
    a. Majority of our LEP population does not speak Spanish in the dental clinic
    b. Students have other courses they should prioritize
    c. The interpreter services that are provided in our institution will not make Spanish a priority to learn for our students
    d. Other (please note):