THE IMPACT OF COMMUNITY ROTATIONS ON THE CULTURAL COMPETENCE OF TEXAS DENTAL HYGIENE STUDENTS

A Thesis

by

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ABSTRACT

A rise in oral health disparities among ethnic minority groups calls for dental professionals to be culturally competent. This study investigated the role of community rotations on the cultural competence of second-year dental hygiene students. Program directors were emailed a preliminary inventory to collect their student demographics and programmatic information regarding community rotations. An adapted paper version of the validated Clinical Cultural Competency Questionnaire (CCCQ) that self-assesses cultural competence was given to students at twelve Texas dental hygiene programs with a response rate of 100% (239/239). Data analysis was performed using the Kendall tau correlation for associations and the Kruskal-Wallis and Mann-Whitney U tests for differences among and between groups. Students scored in the 60-65th percentile in knowledge, skill, and comfort and in the 86th percentile for attitude. This study found that the amount of time spent in community rotations ($p=0.009$), number of community rotations ($p=0.028$), ethnic diversity of patients in program clinics ($p=0.042$), and cultural competence training hours ($p=0.044$) were associated with increased cultural competence scores in Texas dental hygiene students. Those participating in over 50 hours of community rotations ($p=0.006$) scored significantly higher than students with less than 50 hours. Generally, those with four rotations ($p=0.002$) scored higher than students with other numbers of rotations. Those with public clinic ($p=0.049$) and school ($p=0.044$) rotations scored significantly higher than those without these rotation experiences. Those with experience in nursing homes ($p=0.009$) and hospitals ($p=0.026$)

scored lower than those without experience in these rotations. Students seeing the most ethnically diverse patients in program clinics scored higher (p=0.014) than students who saw a less diverse pool of patients. Those with 6-10 training hours scored higher (p=0.013) than those with fewer than 6 hours or more than 10 hours of training. All ethnic minorities, excluding Asians, scored higher than Whites (p=0.008, p=0.020). Based on these results, it is recommended that dental hygiene programs invest significant time in cultural competence training and carefully choose a robust program of community rotations. Furthermore, efforts to improve the diversity of the faculty, student body and clinic patient pool may enhance the cultural competence of graduates.

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NOMENCLATURE

CCCQ	Clinical Cultural Competency Questionnaire
CCCQM	Clinical Cultural Competency Questionnaire Modified
CODA	Commission on Dental Accreditation
TDHPI	Texas Dental Hygiene Program Inventory

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CHAPTER I

INTRODUCTION AND LITERATURE REVIEW

A culturally competent health care provider understands cultural attitudes, values, beliefs, and practices and uses them to guide care for patients, taking into consideration their specific history and needs and avoiding the use of stereotypes and personal biases.[1] Betancourt, Green, Carillo, and Park reported that the health care workforce is not sufficiently diverse or culturally competent.[2] The rising oral health disparities among racial and ethnic minority groups require that dental educators emphasize attainment of cultural competency so that students are prepared to effectively treat and communicate with patients with backgrounds different from their own.

Standard 2-15 of the Commission on Dental Accreditation (CODA) mandates that dental hygiene graduates "be competent in interpersonal and communication skills to effectively interact with diverse population groups and other members of the health care team (p.15)."[3] Many dental hygiene programs currently meet this standard through clinical service-learning, which is a "form of experiential education in which students engage in activities that address human and community needs together with structured opportunities intentionally designed to promote student learning and development."[4] However, clinical service-learning is not required by CODA and is not consistently utilized in all dental hygiene programs. This might affect the cultural competence of dental hygiene students, the subject that was explored in this research project. Thus, this study assessed the cultural competence of Texas dental hygiene students and explored

relationships between students' cultural competence and their community rotation experience (time, type, and number), ethnic diversity of patients, ethnicity of students, and cultural competence training.

Effectiveness of Training

Cultural competence of health care providers can be improved with appropriate education and training.[5] Venturin, Durall, Enciso, Clark, and Mulligan evaluated the efficacy of web-based case scenarios compared to seminar-based training for cultural competency training and found that both resulted in significant improvement of cultural competence scores.[6] Pilcher, Charles, and Lancaster identified improvement of dental students' knowledge and self-awareness regarding cultural competence upon analyzing the cultural competence curricula at the Medical University of South Carolina.[7] Wagner et al. found that a cross-cultural patient instructor program at the University of Connecticut, School of Dental Medicine improved dental students' attitudes towards diversity.[8]

Cultural competency is also improved with an environment that promotes acceptance and respect of ethnic differences.[9] Vu, McCann, Schneiderman, DeWald, Campbell, and Miller evaluated the cultural climate of southwestern dental colleges and found that those students generally felt the cultural climate in their schools was positive. Vu et al. also reported positive outcomes from cultural competence training indicating the importance of such training.[10] Donate-Bartfield, Lobb, and Roucka recommended a multi-disciplinary, patient-centered, and skills-based approach to cultural competence

training after evaluating problems associated with traditional single-discipline and lecture based teaching methods.[11]

Community Rotations

Studies have evaluated health profession students' knowledge, attitudes, and skills following rotations or clinical service-learning experiences at specific schools. Gundersun, Bhagavatula, Pruszynski, and Okunseri surveyed dental students at Marquette University School of Dentistry to assess their self-efficacy, cultural competence, and intent to provide care in school-based settings before and after completion of a mandatory oral health education and promotion rotation.[12] The results of the pre- and post-surveys showed that cultural competence did increase upon completion of the rotation. Dental students were more comfortable treating these types of patients, but their willingness to practice in a similar setting declined. Chen et al. and Amerson both revealed that nursing students participating in a service-learning project increased their cultural knowledge.[5,13] Aston-Brown, Branson, Gadbury-Amoyt, and Bray also found service-learning to be an effective learning strategy to increase dental hygiene students' awareness of underserved populations, cultural diversity, and ethical patient care.[14]

Barriers to Teaching and Assessing Cultural Competence

Although there is a recognized need for cultural competence education, the content and evaluation of learning for these programs is inconsistent.[1] Gregorczyk and Bailit conducted a review of literature of health professional schools in the United States on evaluation instruments, concepts evaluated, and the problems facing cross-cultural

education.[15] They found that available assessment instruments were lacking in validity and reliability and were limited regarding cultural biases and stereotyping risks.[15] They also identified faculty as a barrier because many faculty fail to formally evaluate cultural competence knowledge and performance.[15] Also, there are few minority faculty members serving as role models.[16] Connolly, Darby, Tolle-Watts, and Thomson-Lakey stressed the importance of faculty being measured for cultural adaptability and suggests this as a starting point prior to curricular changes.[16] Such barriers must be considered when planning cultural competence training and evaluation.

Survey Instruments

Multiple commercial inventories such as the Multicultural Counseling Awareness Scale, Multicultural Awareness Knowledge-and-Skills Survey, and the Graduate Students' Experience with Diversity have been used to measure cultural competence.[17] The Cross-Cultural Adaptability Inventory (CCAI) assesses changes in one's cross-cultural effectiveness and assesses strengths and weaknesses in emotional resilience, flexibility/openness, perceptual acuity, and personal autonomy.[18] DeWald and Solomon and Holder-Ballard used the CCAI to determine whether their dental hygiene students' cross-cultural effectiveness improved upon completion of their two year curriculum.[19,20] Neither found a significant improvement.

Tavoc, Newsom, and DeWald used the CCAI to compare cross-cultural adaptability among and between Texas licensed dental hygienists versus dental hygiene students and found no significant differences.[21] Chen, McAdams-Jones, Tay, and Packer conducted a pre- and post-survey using the Inventory for Assessing the Process of

Cultural Competence among Healthcare Professionals-Student Version (IAPCC-SV) to measure the increase of cultural competence of nursing students involved in a service-learning project.[5] They found a significant increase in cultural competence upon completion of the project. The Knowledge, Efficacy, and Practices Instrument for Oral Health Providers (KEPI-OHP) is a more recently developed instrument specifically for oral healthcare providers and might prove useful for dental educators to improve their cultural curricula.[22]

Originally developed for physicians, the Clinical Cultural Competency Questionnaire (CCCQ) has been used throughout many healthcare professions including pharmacy students, osteopathic medicine students, cardiovascular physicians and dental students.[23] Physician knowledge, skills, attitudes, and comfort level associated with the delivery of culturally competent healthcare to diverse patient populations are measured through eighty-six items distributed across six domains - Demographics, Knowledge, Skills, Comfort with Encounters/Situations, Attitudes, and Education and Training. These are self-assessed by the participant with a five point Likert scale.[24] Evans and Hanes used a modified version of the CCCQ to evaluate the effectiveness of an interactive online cultural competence course at Georgia Regents University and found significant improvement in the areas of self-awareness, knowledge, attitude and skills among dental and radiology students.[23] A modified version of the CCCQ was selected to be the most appropriate survey instrument for this study.

Regarding validity and reliability of the original CCCQ instrument, modified versions of the CCCQ in pharmacy and medical education and with physicians, nurses,

and other hospital staff in practice, indicate high internal consistency and suggest sensitivity to detect differences between groups.[25] Hudleson, Junod Perron, and Perneger used the test-retest reliability method to establish reliability for surveying physicians and medical students regarding their attitudes toward caring for immigrant patients.[26] Exploratory factor analysis has also been used to establish validity when testing pharmacy students' perceived level of cultural competence to guide curriculum development.[27]

Summary

Oral health care disparities exist between minorities and mainstream populations in the United States, and these disparities could be improved by cultural competence training of dental hygiene students.[28] The results of this study could be used by Texas dental hygiene programs to collaboratively develop cultural training and educational experiences, such as community rotations. If community rotations enhance cultural competence, their rotations could be an important component of cultural competence training. Such collaboration was suggested by Gregorczyk and Bailit when they reviewed the conceptual and measurement challenges facing health professional schools and found a lack of consistent core cultural concepts and teaching and evaluation methods.[15] Texas dental hygiene educators could benefit by being able to better prepare students to provide culturally competent care to patients, thus improving patients' oral health despite cultural differences or disparities.

While community rotations and cultural competence have been evaluated by dental and dental hygiene programs separately, a direct link has not been established

between students' experiences with community rotations and their cultural competence. Also, the cultural competence of Texas dental hygiene students has not been assessed. The purpose of this study was to assess the cultural competence of Texas dental hygiene students and the impact of participation in clinical community rotations on their cultural competence. Various specific research questions explored relationships between cultural competence, training, and community experiences. A modified version of the CCCQ, developed by Robert C. Like, MD, MS, was used to measure the knowledge, skills, comfort, and attitudes of dental hygiene students regarding culturally competent patient care.[24]

Statement of Research Questions

1. How culturally competent are Texas dental hygiene students?
2. What is the range of community experiences that students have?
3. Do community experiences with diverse patient populations influence the cultural competence of dental hygiene students (knowledge, skills, and attitudes)?
4. Do other factors influence cultural competence, such as cultural competency training and ethnicity of the provider?

CHAPTER II

METHODS

Study Population and Sampling Plan

The potential participants in this study were all second-year dental hygiene students from the twenty-six Texas dental hygiene programs in Texas. Second-year students were selected due to their experience in the program clinics and community rotations. First-year students do not usually start their community rotations until the second year. These programs were identified on the Texas State Board of Dental Examiner's website which includes the name of the program, address, phone and fax numbers, and the name and email of the program director. Although the list did not contain the names of students in the class, the list was used to contact programs via phone and email to distribute the Texas Dental Hygiene Program Inventory (TDHPI) to program directors and the Clinical Cultural Competency Questionnaire Modified (CCCQM) to their second year students.

Project Procedures

A Texas Dental Hygiene Program Inventory (see Appendix A) was emailed to the program directors of each Texas dental hygiene program to identify the number of hours students spent in different types of community rotations, number of hours of cultural competency training, and the ethnic proportions of students and patients. Fourteen of the twenty-six programs responded, but only twelve programs ended up participating. This was an appropriate sample size of 239 students, representing almost

half of the dental hygiene programs in Texas with students having a full range of community experiences and patient diversity.

The directors of the twelve participating dental hygiene programs returned a signed site authorization letter, granting permission for their program to participate in the study. Approval was also granted by each program's Institutional Review Board (IRB). Appendix B contains the invitational email, and Appendix C illustrates the site authorization template. Each responding program was mailed a packet that contained surveys for each second-year dental hygiene student with a self-addressed envelope to make returning the surveys easier, ensuring increased response rates. Every survey contained a paragraph regarding informed consent and anonymity of the survey; consent was assumed upon completion of the survey. Table 1 displays the five contacts made with Texas dental hygiene program directors throughout the course of this study.

Clinical Cultural Competency Questionnaire Modified

The CCCQM was mailed as a paper survey to the program directors at each of the twelve schools. The program directors distributed the surveys to the second year students (n=239) during their last semester of the program. Each program director returned the surveys in the provided envelope. The CCCQM found in Appendix G contains two demographic and two qualitative questions in addition to the twenty three questions adapted from the CCCQ that measured their self-assessment of cultural competence in regards to knowledge, skill, comfort, and attitude, yielding an overall cultural competence score. This survey was used with permission from Robert C. Like, who developed the original CCCQ.[24] The instrument uses a Likert-scale that allows

dental hygiene students to self-assess their knowledge, skill, comfort, and attitude regarding culturally competent patient care. The survey was modified for ease of completion and to better answer the research questions of this project.

The CCCQM was reviewed by a committee of experts in study design, data analysis, and cultural diversity at Texas A&M University Baylor College of Dentistry. Prior studies have established a high level of reliability and validity for the original CCCQ.[25, 26, 27] In this study, Cronbach's alpha indicated that the CCCQM was highly reliable overall (α=0.908) as well as each of the four scales of knowledge (α=0.844), skill (α=0.863), comfort (α=0.856), and attitude (α=0.708).

Data Analysis

Data analysis was performed using IBM SPSS Statistics, Version 22 software. The basic findings of the CCCQM were summarized by descriptive statistics. Hypotheses about differences among and between groups were tested using the Kruskal-Wallis test and pairwise Mann-Whitney U tests respectively. Kendall's tau correlation was used to test associations. These non-parametric procedures were more appropriate since the data were non-normally distributed, and there were numerous ties in the data. A significance level of less than 0.05 was used. Specifically, these statistical tests were used to look for the relationship between various factors and the knowledge, skill, comfort, attitude, and overall cultural competence score of Texas dental hygiene students. The four scales were combined to yield an overall cultural competence score.

CHAPTER III

RESULTS

Texas Dental Hygiene Program Inventory

The ethnicities of student respondents as reported by program directors are displayed in Figure 1. The majority of students were White/Caucasian (65%), followed by Hispanic Latino (22%), Asian (10%), African American (1%), Native American (1%), and Other (1%). Due to the sparsity in some of the original six ethnic groups, students were collapsed into four categories: White, Hispanic, Asian, and other. The "Other" category included the small percentage of students who were of African-American, Native American, or other specified ethnicities. Figure 2 illustrates the ethnic proportions of the collapsed categories.

Table 2 displays the type of cultural competence training programs in which the students participated and the average number of hours spent in each. All but one program offered some type of training. Dental hygiene programs offering cultural competence training either provided a lecture, a course, and/or a specific training program to train their students in cultural competence. The ethnic percentages of the patient populations for the community rotations and program clinics, as estimated by program directors in the TDHPI, can be found in Figure 3. A summary of the TDHPI responses for the twelve participating dental hygiene programs can be found in Appendix H.

Cultural Competence of Texas Dental Hygiene Students

A total of 239 CCCQM were completed for an overall response rate of 100% (n=239/239). Table 3 shows the descriptive statistics for the knowledge, skill, comfort, attitude, and overall cultural competence scores as well as the range of possible scores for each. The mean overall cultural competence score of these Texas dental hygiene students was 87.28, with a median of 88 and scores ranging from 52-115. Students scored between the 60^{th} and 65^{th} percentile for knowledge, skill, and comfort. Students scored highest in attitude at the 86^{th} percentile. With the exception of overall cultural competence, none of these variables were normally distributed. Therefore, they are summarized here using medians and interquartile range (IQR). In the interest of completeness, means and standard deviation are also displayed.

Range of Community Rotation Experiences

The range of community experiences, including the amount of time spent in each rotation, the number of rotations, and the type of rotations, was also gathered from the TDHPI completed by program directors. Table 4 displays the type of community rotations that the students participated in and gives the number of programs participating and the average hours spent in each rotation. Overall time spent in community rotations ranged from 0 to 108 hours, depending on the program. Each program participated in anywhere from 0 to 5 community rotations. At least half of the programs spent time in schools and nursing homes. However, the highest average number of hours was spent in public clinics.

Hours Spent in Community Rotations and Cultural Competence

The amount of time spent in community rotations ranged from 0 to 108 hours but was divided into two categories, 0 to 50 hours and over 50 hours. Table 5 shows the correlations between the time spent in community rotations and cultural competence scores. The Kendall tau test of correlation revealed a small but highly significant association between knowledge (tau=0.154, p=0.001) and overall cultural competence (tau=0.124, p=0.009) scores and the amount of hours spent in community rotations. Students spending over 50 hours in community rotations scored significantly higher in knowledge (median scores 18 vs. 17) and overall cultural competence (median scores 89 vs. 85) than the students who spent 0 to 50 hours in community rotations, as illustrated by the results of the Mann-Whitney U test in Table 6.

Number of Community Rotations and Cultural Competence

Although small, a significant association was found between the number of community rotations students participated in and knowledge score using Kendall tau's correlation coefficient (tau=0.108, p=0.028). No association was found between the number of community rotations and skill, comfort, attitude, and overall cultural competence scores. When students were divided into six groups according to the number of rotations, the following significant differences were found in knowledge ($p<0.001$), skill ($p<0.001$), comfort ($p=0.004$), attitude ($p=0.002$), and overall cultural competence ($p<0.001$).

Table 7 breaks down the results of the post-hoc, pairwise Mann-Whitney U tests. These tests further revealed that those participating in four rotations scored significantly

higher than those participating in none (median scores of 20 vs. 16) and two (medians scores of 20 vs. 16) rotations, and those participating in three rotations scored significantly higher than those participating in only two rotations (median scores 18 vs. 16). For skill and overall cultural competence, students participating in four rotations scored significantly higher than those participating in two and three rotations. Comfort and attitude scores differed significantly between students participating in four and two rotations, with those participating in four rotations scoring higher in both instances. Those students with four rotations, not five, did the best in skill, comfort, and overall cultural competence. Other factors related to the programs with five rotations must be looked at to speculate why this occurred.

Types of Community Rotations and Cultural Competence

The TDHPI given to program directors indicated that students participated in eleven different types of rotations (see Table 4). At least four or more programs participated in a combination of rotations such as jails, hospitals, schools, public clinics, and nursing homes. A variety of other clinical rotations were only participated in by a single dental hygiene program and included a religious affiliated clinic, state school, VA dental clinic, Head Start, health fair, and Air Force dental clinic. These were all grouped into the "other" rotation category.

Mann-Whitney U tests were used to find differences between those who did and did not participate in the different types of community rotations. Students who participated in public clinic rotations scored significantly higher than students who did not participate in public clinic rotations in comfort ($p=0.049$, median scores of 16.5 vs.

16), attitude (p=0.007, median scores of 28.5 vs. 30), and overall cultural competence (p=0.040, median scores of 90 vs. 85). Those participating in school rotations scored significantly higher in knowledge (p=0.044, median scores of 18 vs. 17). Students with the "other" rotation experience scored significantly higher than those without "other" rotation experience in knowledge (p<0.001, median scores of 19 vs. 17), skill (p=0.001, median scores of 27 vs. 24), attitude (p=0.003, median scores of 30 vs. 28.5), and overall cultural competence (p<0.001, median scores of 92 vs. 85).

Some experiences had a negative influence on cultural competence. Students with hospital and nursing home experience scored lower than those without the experience in those community rotations. Those with nursing home experience scored lower than those without experience in knowledge (p=0.009, median scores of 18 vs. 17), skill (p=0.001, median scores of 27 vs. 24), comfort (p<0.001, median scores of 17 vs. 15), attitude (p=0.001, median scores of 30 vs. 28), and overall cultural competence (p<0.001, median scores of 92 vs. 85). Those with experience in hospital rotations scored lower than those without experience in skill (p=0.020, median scores of 26 vs. 23) and overall cultural competence (p=0.026, median scores of 89 vs. 84). Other aspects of these programs must be analyzed to explain these anomalies.

Ethnic Diversity of Patient Pools

The extent of ethnic diversity of patients in program clinics and community rotations were categorized as least, somewhat, or most diverse. The least diverse patient populations had at least one ethnicity that comprised 60% or more of the pool. Somewhat diverse populations contained at least one ethnicity that made up 50-59% of

the pool. The patient pools in which at least two of the ethnicities did not exceed 50% were designated as most diverse.

No significant relationships were found between the extent of ethnic diversity of patients seen in community rotations and cultural competence scores. However, a small but significant association was found between the diversity of patients seen in program clinics and skill (tau=0.189, p=0.001), overall cultural competence (tau=0.181, p=0.001), and attitude (tau=0.114, p=0.042) as seen in Table 8.

The Kruskal-Wallis tests followed by post-hoc Mann-Whitney U tests revealed significant differences between the ethnic diversity of patients seen in program clinics and overall cultural competence ($p<0.001$) scores, skill($p<0.001$), knowledge (p=0.010), comfort (p=0.023), and attitude (p=0.005). The results of the Mann-Whitney U tests are displayed in Table 9. Students who saw the most ethnically diverse patient population scored higher in overall cultural competence, skill, comfort, and attitude than those students seeing least and somewhat ethnically diverse patient pools. For knowledge, there was only a difference in scores between those seeing a most and somewhat ethnically diverse patient population in program clinics.

Cultural Competence Training

Factors beyond the range of community rotation experiences, including cultural competence training hours, were also assessed for their impact on cultural competence. Program directors reported that cultural competence training hours ranged from 0-12 hours. When testing for differences, these training hours were divided into three groups: 0-5 hours, 6-10 hours, and over 10 hours. A small association was found using the

Kendall tau correlation test between the number of cultural competence training hours students received and overall cultural competence (tau=0.113, p=0.032), attitude (tau=0.112, p=0.036), and knowledge (tau=0.107, p=0.044). Mann-Whitney U tests showed that students with 6-10 hours of cultural competence training scored significantly higher than students with 0-5 hours of cultural competence training in every category except for comfort (Table 10). Students with 6-10 hours of cultural competence training also scored significantly higher than students with over 10 hours of training in overall cultural competence and skill. Other aspects of these programs may have contributed to this anomaly.

Ethnicity of Students

The ethnicity of the students was also considered. Statistical analysis of student ethnicity was performed based on the collapsed ethnic categories. Students of "Other" ethnicity scored significantly higher than Whites in overall cultural competence (p=0.020, median scores 93 vs. 85) and knowledge (p=0.020, median scores 21 vs. 17) when tested with the pairwise Mann-Whitney U tests as seen in Table 11. Hispanics scored significantly higher than Whites in skill (p=0.005, median scores 27 vs. 24) and overall cultural competence (p=0.008, median scores 93 vs. 85).

Open-ended Questions

Of the 239 students, 153 students provided 208 comments on at least one of the two open-ended questions regarding their significant educational experiences in program clinics, community rotations, or cultural competence training. The five most common themes were unique individual experiences in program clinics/community rotations

(n=64), language barriers (n=46), cultural competence training (n=43), general dental hygiene program experiences (n=37), and cultural competence issues specific to dental hygiene (n=18). The largest number of comments was about unique encounters students had while in program clinics and community rotations. These are the types of experiences contemplated by Standard 2-15 of the Commission on Dental Accreditation, which calls for graduates to "be competent in interpersonal and communication skills to effectively interact with diverse population groups".[3]

Regarding cultural competency training, one student put it best, "I feel that they do a great job teaching us about cultural competency and sensitivity but there's nothing like actually having a patient with different beliefs to teach you how to interact and plan their treatment." Another student said, "I learned to work with all different types of patients in rotations." A few comments regarding students' general dental hygiene program experiences discussed cultural exposure through the diverse ethnicities of other students and faculty. One student reiterated the purpose of this study, "Every dental hygienist should know how to communicate and understand every other culture out there especially in the United States, because it is a multi-cultural country." Table 12 highlights more comments for each theme.

CHAPTER IV

DISCUSSION

This study found that the cultural competence of Texas dental hygiene students was significantly enhanced by participation in community rotations. It was also influenced by having a diverse patient pool in the program clinics, cultural competence training, and student ethnicity. These results have significant implications for dental hygiene curricula and the design of patient care experiences.

Cultural Competence of Texas Dental Hygiene Students

Students scored highest (86^{th} percentile) in their attitude towards cultural competence. This is a good foundation for producing overall culturally competent dental hygienists. However, these results indicate a need for focusing cultural competence training in the areas of knowledge, skill, and comfort where students scored between the 60^{th} and 65^{th} percentile for each. As stated in multiple student responses to the open-ended questions, training helps but it is the actual patient interaction where students gain the experience they need to excel in these areas of cultural competence.

Range of Community Rotation Experiences

This study found cultural competence scores were higher with community experiences and linked to the time spent and the number of rotations. This parallels previous studies showing increased cultural competence with service-learning and community rotation experience.[5,12,13,14] Based on these findings, dental hygiene programs should evaluate the amount of time their students are spending in community

rotations when looking to improve skill, knowledge, and overall cultural competence. Those participating in more rotations generally scored higher than those participating in fewer rotations. However, for skill, comfort, and overall cultural competence, those participating in four rotations scored higher than those participating in five rotations. It may be that participation in more than four rotations led to less time spent in each, which may explain this somewhat unexpected finding. Only one program participated in four rotations and this program spent the most amount of time in community rotations at 108 hours. Also, the two programs participating in five rotations had the least amount of training hours in the 0-5 hours category.

Participation in public clinics, schools, and "other" rotations resulted in an increase in cultural competence scores. Public clinic rotations should be considered when looking to improve attitude, comfort and overall cultural competence. Perhaps these programs spent the highest average amount of time in public clinics due to the positive influence on students' cultural competence. When looking to improve cultural competence knowledge through a community rotation, schools and "other" rotations should be options. Students with "other" rotation experience also scored higher in skill, attitude, and overall cultural competence.

On the other hand, those with hospital and nursing home experience scored lower in skill and overall cultural competence. The four programs with hospital experience all had the lowest amount of cultural competence training hours (0-5 hours). Those without nursing home experience scored higher than those with experience in knowledge, skill, comfort, attitude, and overall cultural competence. Although six programs participated

in nursing homes, this rotation experience had the second lowest average amount of five hours spent in it, which may have contributed to lower scores.

Ethnic Diversity of Patient Pools

While the ethnic diversity of patients seen in community rotations had no relationship with cultural competence scores, significant relationships were noted for every cultural competence scale with the ethnic diversity of patients seen in the program clinics. These results could be faulty as one dental hygiene program was unable to provide the ethnicities of their patients seen in community rotations, and another program had no data for this category as they did not participate in community rotations. Although it can sometimes be a hard variable to control, dental hygiene programs should make sure their students are seeing the most ethnically diverse patients possible.

Cultural Competence Training

Cultural competence training has been shown to improve cultural competence knowledge, self-awareness, and attitudes.[5,6,7,8, 10] This study supports these past findings as training increased for every cultural competence scale except for comfort. For skill and overall cultural competence, students with six to ten training hours scored higher than students with over ten training hours, contradicting the idea that more training hours are better. This could be due to only two programs (29 students) having over ten training hours, both of which spent less than 50 hours in community rotations. These findings suggest that when looking to improve student comfort, the number of rotations should be considered more important than cultural competence training. However, cultural competence training may be a good tool for improving all other areas of cultural

competence including knowledge, skill, and attitude. This study only evaluated the time spent in cultural competence training, but it would be beneficial to evaluate the type of training in future studies.

Ethnicity of Students

There were differences among the student ethnic groups with regard to knowledge, skill, and overall cultural competence scores. Although Whites comprised the largest ethnicity of the students, Hispanics scored significantly higher than Whites in skill and overall cultural competence. The smallest ethnic category of "Other" scored moderately higher than Whites in knowledge and overall cultural competence. The majority can often be unaware of minority issues or sensitivities. Perhaps this means that Whites may need more community rotation experience and training when it comes to cultural competence issues. These findings support the idea that ethnicity of students is a factor to be considered when teaching and assessing cultural competence. Although faculty ethnicity was not assessed, Connolly et al. identified the lack of minority faculty members as a barrier to cultural competence.[16] This should be considered as well as the ethnicity of the students and patients.

Limitations and Future Research

This cross sectional study primarily looked at the relationships of cultural competence to the range of community rotation experience, ethnic diversity of patients, ethnicity of students, and cultural competence training experienced at dental hygiene programs at a single point in time. The CCCQM is a self-assessment, and so it is not a standard measure of knowledge and other aspects of cultural competence. Another

limitation is that the ethnic proportions of patients were estimated by program directors, and they indicated that the ethnicity of the patients seen in the program clinics is easier to track than the ethnicity of the patients seen in community rotations. This may have altered these results. There is also a possibility that selection bias occurred. Perhaps the program directors with the least comfort with their community rotation involvement chose not to participate. This would have inflated the cultural competence scores.

Future cohort studies that examine student cultural competence over time with and without rotations may better our understanding of causality and help dental hygiene programs identify the strengths and weaknesses of their cultural competence training and community rotation programs. Future studies may also want to develop or use a measure of cultural competence performance instead of a self-assessment. Although this study evaluated students at the state level and compared different programs' experiences, dental hygiene programs could use this instrument internally to assess the cultural competency of their own students as DeWald and Solomon and Holder-Ballard did.[19,20] More questions could be added to the CCCQM, such as the demographics and education and training domains from the original CCCQ and questions regarding their community rotation experience. Although there were some limiting factors to this study, the study does provide a view of how community rotations (or lack thereof) impact the cultural competence of Texas dental hygiene students attending almost half of the programs in Texas.

Recommendations for Future Practice

Previous studies have shown that positive cultural environments that promote acceptance and respect of ethnic differences help improve cultural competency.[9, 10] The findings of this study parallel previous findings that the ethnicity of students, patients, and faculty should be considered when implementing any type of cultural competence training, whether it be a community rotation or a training module.[8,9,11,15,16] The findings in this study also promote the idea of students spending more time in a variety of community rotations as well as receiving adequate training on cultural competence to enhance their knowledge, skill, comfort, and attitude regarding cultural competence. Programs not participating in community rotations should consider developing them to improve students' cultural experience and better prepare them. Programs already participating in community rotations should use an assessment tool similar to the one used in this study to evaluate the impact of their community rotation program on students' cultural competence. If scores are found unsatisfactory, it is recommended that dental hygiene programs consider the time spent, number, and type of community rotations as well as time spent in cultural competence training and the ethnicity of students, patients, and faculty.

Conclusion

Based on nearly half of the dental hygiene programs in Texas, this study demonstrates an unambiguous link between the extent of community rotations and cultural competence. Prior studies have been conducted at various health professional programs to assess the efficacy of community rotations and service-learning projects on

cultural competence and have shown an increase in cultural competence knowledge, comfort, and attitudes.[5,12,13,14] However, this study is the first of its kind to evaluate the impact of community rotation experiences on dental hygiene students' cultural competence throughout the state of Texas. This study found that the amount of time spent in community rotations, number of community rotations, types of community rotations, ethnic diversity of patient pools, ethnicity of students, and cultural competence training were associated with increased cultural competence scores in Texas dental hygiene students. Based on these findings, it is recommended that dental hygiene programs spend more time in a variety of community rotations and cultural competence training, treating ethnically diverse patients, to assure their students graduate with the competence necessary to treat diverse patient populations.

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APPENDIX A

TEXAS DENTAL HYGIENE PROGRAM INVENTORY

Program: _____

Question		
How many students are in your **2nd** year (graduating) class?		
What is the ethnic breakdown of your **2nd** year class by percentages. (Should total 100%)	**Group**	**%**
	White/Caucasian-	
	African-American-	
	Hispanic/Latino-	
	Asian-	
	Other-	
	TOTAL	**100%**
How many clock hours does each student spend in community rotations over the course of the whole program, first and second year? (# of clock hours)	**_____ hours**	
Indicate the type of community rotation and the number of clock hours each student spends in the following rotations over the course of the whole program, first and second year. (Mark NA if a rotation is not visited.)	**Rotations**	**# of Clock hours**
	Jail	
	Hospital	
	School	
	Nursing home	
	Public community clinic	
	Faith-based clinic	
	Other (please specify)	
Please estimate the general demographics of the patient populations treated at all the community rotations your students visit by percentages. (Should total	**Group**	**%**
	White/Caucasian	
	African-American	
	Hispanic/Latino	
	Asian	

100%, leave blank if there are no rotations).	Other	
	Total	**100%**
Indicate the type and number of clock hours your students spend in **cultural competence training** over the course of the whole program.	**Type**	**# of Clock Hours**
	None	
	Single lecture	
	Semester long course	
	Special training program	
Please estimate the demographics of the patient population in your college clinic by percentages (Should total 100%).	**Group**	**%**
	White/Caucasian	
	African-American	
	Hispanic/Latino	
	Asian	
	Other	
	Total	**100%**

APPENDIX B

INVITATIONAL EMAIL

Dear Program Director,

Thank you for completing the questionnaire regarding your program's demographics, community rotations and cultural competency training. I am writing to formally ask your participation in this study that includes second year dental hygiene students in Texas. This study is an attempt to discover the impact of ethnic demographics, community clinical rotations and cultural competence training on dental hygiene students' knowledge, skills, comfort and attitudes regarding cultural competence. By obtaining knowledge regarding how community clinical rotations, cultural competence training, and ethnic demographics impact cultural competence, we can discover valuable information that will assist all dental hygiene faculty in future decisions about community clinical rotations and cultural competence education.

I will ask for your assistance in administering the survey by mailing a packet with enough surveys for your second year class and asking that you return all completed surveys in the provided self-addressed and stamped envelope. The survey should take no more than 15 minutes of your students' time.

Students' answers will be completely anonymous and will be released only as summaries in which no individual's answers can be identified. Also, the identity of your school will not appear in any publications or presentations issuing from this research.

If you agree to participate in the study, I ask that you please return the completed attached site authorization form at your earliest convenience. This form is necessary for my IRB approval in order to begin the study. I have attached a template for you to sign and complete. Please note this form **should be printed on your school's letterhead.** If you prefer, you can email me a scanned copy of the signed letter.

I am happy to answer any questions or concerns you may have about the study. Please feel free to contact me directly by emailing me at rclasse@bcd.tamhsc.edu.

Thank you for helping me with this important study on cultural competence.

Sincerely,

Rita Ann Classe, RDH, BS
Candidate for MS-EDHP
Caruth School of Dental Hygiene
Texas A&M University Baylor College of Dentistry

APPENDIX C

SITE AUTHORIZATION LETTER TEMPLATE

Dental Hygiene Program/College/University
Letterhead Here

Institutional Review Board
Texas A&M University Baylor College of Dentistry
3302 Gaston Avenue
Dallas, Texas 75246

We formally authorize Rita Ann Classe, a dental hygiene graduate student at Texas A&M University, to conduct research at our facility for her study, "The Impact of Community Rotations on the Cultural Competence of Texas Dental Hygiene Students."

Ms. Classe may email our dental hygiene program director and mail copies of her survey to our school beginning February 1, 2015. She may conduct research until her project end date of August 31, 2015. This study aims to assess the impact of factors affecting Texas dental hygiene students' cultural competence through the conduction of a survey on the knowledge, skills, comfort, and attitudes of 2nd year dental hygiene students who agree to participate in the study. Our dental hygiene program director will provide Ms. Classe with access to administer the survey to our 2nd year dental hygiene students and will return completed surveys via mail with the provided self-addressed and stamped envelope.

Ms. Classe has also agreed to provide my office a copy of the Texas A&M University approval letter document before she administers the survey and will also provide a copy of her published study. We understand that there will be no costs or direct benefits to the participants and that participation by the students is voluntary.

If there are any questions, please contact my office.

Signed,

Program Director

APPENDIX D

COVER LETTER

Dear Program Director,

Thank you for completing the site authorization letter and agreeing to participate in this study that attempts to discover the impact of ethnic demographics, community clinical rotations and cultural competence training on dental hygiene students' knowledge, skills, comfort and attitudes regarding cultural competence. By obtaining knowledge regarding how community clinical rotations, cultural competence training, and ethnic demographics impact cultural competence, we can discover valuable information that will assist all dental hygiene faculty in future decisions about community clinical rotations and cultural competence education.

Your students were selected to participate in this survey because of the need for diverse community, clinical, and training experiences. We are asking dental hygiene students from 12 other Texas dental hygiene programs to participate in this study. Participation is voluntary and will have no effect on the academic standing of students. The chance of informational risk is minimal since the survey is anonymous. Furthermore, disclosure of the non-sensitive survey results would be inconsequential. The benefit to the dental hygiene programs and culturally diverse patient populations exceeds the risk.

Students' answers will be anonymous and will be released only as summaries in which no individual's answers can be identified. Also, the identity of your program will not appear in any publications or presentations issuing from this research.

This questionnaire will only take about 15 minutes of your students' time. Please have them complete the survey and return via the enclosed self-addressed and stamped envelope by _____. I am happy to answer any questions or concerns you may have about the study. Please feel free to contact me directly at (469) 952-7890 or rclasse@bcd.tamhsc.edu. For questions regarding the rights of research subjects, please contact Vice Chair of the Institutional Review Board, Dr. Charles Wakefield at (214) 828-8963 or cwakefield@bcd.tamhsc.edu .

Thank you for helping me with this important study on cultural competence.

Sincerely,

Rita Ann Classe, RDH, BS
Candidate for MS-EDHP
Ann McCann, RDH, PhD
Principal Investigator
Director of Planning and Assessment
Texas A&M University Baylor College of Dentistry

APPENDIX E

REMINDER EMAIL

Dear Program Director,

About two weeks ago, I mailed your students a survey assessing the impact of community clinical rotations, dental hygiene school clinics, and cultural competency training on dental hygiene students' cultural competence. The responses of the dental hygiene students who have already completed the survey have provided valuable insight. Your input is very important to this process.

I am writing to request your participation if you have yet to have students complete the survey. Your participation is necessary to help us get accurate results. Although we sent surveys to 12 other dental hygiene programs in Texas, it is only by hearing from everyone in the population that we can be sure that the results are truly representative.

Students' answers will be anonymous and will be released only as summaries in which no individual's answers can be identified. Also, the identity of your school will not appear in any publications or presentations issuing from this research. This survey will take no more than 15 minutes of your students' time. Please complete this survey and return by mail by_____.

I am happy to answer any questions or concerns you may have about the study. Please feel free to contact me directly at (469) 952-7890 or rclasse@bcd.tamhsc.edu. For questions regarding the rights of research subjects please contact the Vice Chair of the Institutional Review Board, Dr. Charles Wakefield at (214) 828-8963 or cwakefield@bcd.tamhsc.edu .

Thank you for helping me with this study this important study on cultural competence.

Sincerely,

Rita Ann Classe, RDH, BS
Candidate for MS-EDHP
Ann McCann, RDH, PhD
Principal Investigator
Director of Planning and Assessment
Texas A&M University Baylor College of Dentistry

APPENDIX F

THANK YOU EMAIL

Dear Program Director,

I want to thank you for your participation and help in this study from the Caruth School of Dental Hygiene an affiliation of the Texas A&M University, Baylor College of Dentistry. Without your participation, this study would not have been successful. I look forward to analyzing the information gathered to see how this can benefit and strengthen Texas dental hygiene programs, like yours.

If you have any questions or would like to be informed of survey results, please feel free to contact me at rclasse@bcd.tamhsc.edu.

Sincerely,

Rita Ann Classe, RDH, BS
Candidate for MS-EDHP
Ann McCann, RDH, PhD
Principal Investigator
Director of Planning and Assessment
Texas A&M University Baylor College of Dentistry

APPENDIX G

CLINICAL CULTURAL COMPETENCY QUESTIONNAIRE MODIFIED

The Cultural Competence Survey of Texas Dental Hygiene Students*

This survey is designed to gather information regarding the impact of ethnic demographics, community clinical rotations and cultural competence training on dental hygiene students' knowledge, skills, comfort and attitudes regarding cultural competence. This is an anonymous survey and we will protect your identity in all publications. Participation in this survey is entirely voluntary and you may exit at anytime. Refusal to participate will have no effect on your academic standing. Your participation is appreciated.

If you have any questions, please contact Rita Ann Classe at (469) 952-7890 or rclasse@bcd.tamhsc.edu. If you have any questions about your rights as a research participant or have other concerns about the study, you may contact the Vice Chair of the Institutional Review Board, Dr. Charles Wakefield, at (214) 828-8963 or cwakefield@bcd.tamhsc.edu .

DEMOGRAPHICS

1. What is your racial/ethnic group (with whom do you primarily identify)?
   - A. White/Caucasian
   - B. African-American
   - C. Hispanic/Latino
   - D. Asian
   - E. Native American
   - F. Other_____

2. Approximately how many hours of cultural competency training have you received in your dental hygiene education?

   A. None B.1-5hrs C. 6-10hrs D. 11-15hrs E. 15+hrs

How **KNOWLEDGEABLE** are you about each of the following areas?

	Not at all 1	Very little 2	Somewhat 3	Quite a bit 4	Very much 5
3. Demographics of different racial and ethnic groups	□	□	□	□	□
4. Social & cultural characteristics of different racial and ethnic groups	□	□	□	□	□
5. Health risks experienced by different racial and ethnic groups	□	□	□	□	□
6. Disparities in access to healthcare experienced by different racial and ethnic groups	□	□	□	□	□
7. Impact of prejudice and discrimination on health care experiences	□	□	□	□	□

How **SKILLED** are you in dealing with the following areas of patient care with different ethnic groups?

	Not at all 1	Very little 2	Somewhat 3	Quite a bit 4	Very much 5
8. Communicating effectively with patients from different ethnic groups	□	□	□	□	□
9. Eliciting information on the patient's dental needs, concerns, and preferences from all ethnic groups	□	□	□	□	□
10. Establishing a rapport with members of diverse patient populations	□	□	□	□	□
11. Developing and negotiating a culturally sensitive treatment plan	□	□	□	□	□
12. Providing culturally sensitive preventive services	□	□	□	□	□
13. Dealing with adherence/compliance problems due to cultural beliefs and practices	□	□	□	□	□
14. Working effectively with an interpreter	□	□	□	□	□

How **COMFORTABLE** are you in dealing with the following cross-cultural encounters or situations?

	Not at all 1	**Very little 2**	**Somewhat 3**	**Quite a bit 4**	**Very much 5**
15. Providing dental hygiene care for patients of different backgrounds than your own	□	□	□	□	□
16. Interpreting different cultural expressions of pain, distress, and suffering	□	□	□	□	□
17. Developing and negotiating a culturally sensitive treatment plan	□	□	□	□	□
18. Providing culturally sensitive preventive services	□	□	□	□	□

ATTITUDES

	Not at all 1	**Very little 2**	**Somewhat 3**	**Quite a bit 4**	**Very much 5**
19. How IMPORTANT are social and cultural beliefs when treating your patients?	□	□	□	□	□
20. How AWARE are you of your own cultural identity?	□	□	□	□	□
21. How AWARE are you of your own biases and prejudices?	□	□	□	□	□
22. How IMPORTANT do you feel it is for healthcare professionals to receive training in providing health care to different cultural groups?	□	□	□	□	□
23. How adequately do you feel your <u>cultural competency training</u> prepared you to provide health care to different cultural groups?	□	□	□	□	□
24. How adequately do you feel your <u>clinical experience</u> prepared you to provide health care to different cultural groups?	□	□	□	□	□
25. How much do your cultural beliefs influence your interaction and decision making regarding treatment?	□	□	□	□	□

Open-Ended Questions

26. Is there any significant experience that you had in the school clinic or your community rotation related to cultural competency?

_____
_____
_____
_____
_____
_____
_____

27. Anything else you want to tell us about cultural competence and your dental hygiene program experiences?

_____
_____
_____
_____
_____
_____
_____

*This survey has been adapted with permission from the CCCQ developed by Robert C. Like, MD, MS, Professor and Director of the Center for Healthy Families and Cultural Diversity, Department of Family Medicine and Community Health, Rugerts Robert Wood Johnson Medical School.[24]

APPENDIX H

SUMMARY OF TEXAS DENTAL HYGIENE PROGRAM INVENTORY

RESPONSES

Program*	**Hours in Community**	**Type of Community Rotations**	**Student Ethnicity**	**Community Patient Ethnicity**	**School Clinic Patient Ethnicity**	**Cultural Competence Training**
Program A	72	Jail-hrs Hospital-32hrs School-20hrs	White-67% Hispanic-13% Asian-7% Other-13%	White- 50% AA- 10% Hispanic-35% Asian 5%	White-22% AA-23% Hispanic-50% Asian- 5%	Multiple lectures-3hrs
Program B	108	School-8hrs Public Clinic-48hrs Faith Clinic-16hrs VA Dental-36hrs	White-40% AA-3% Hispanic-31% Asian-17% Other-9%	Not provided	White-32% AA-22% Hispanic-37% Asian- 5% Other- 4%	3 Lectures-5hrs Virtual Pt Lab-1.5hrs
Program C	72	Jail- 8hrs Hospital-16hrs Public Clinic-48hrs	White-73% Hispanic-20% Asian-7%	White- 30% AA- 5% Hispanic-60% Asian-5%	White-55% AA-3% Hispanic-35% Asian- 1% Other- 6%	Lecture-2hrs
Program D	68	Jail- 18hrs School-24hrs Nursing home-8hrs Head Start-10hrs Misc. health fairs-8hrs	White-90% Hispanic-10%	White- 25% AA- 38% Hispanic-37%	White-40% AA-25% Hispanic-35% Asian- 5%	Lecture-5hrs

Program E	40	Nursing Home-10hrs Public Clinic-30hrs	White-91% Other-9%	White- 17% AA- 3% Hispanic- 5% Native American-75%	White-70% AA-9% Hispanic-20% Asian- 1%	Lecture-3hrs Course-8hrs
Program F	28	School- 10hrs Nursing Home-2hrs State school-16hrs	White-96% Hispanic-3% Asian-1%	White- 35% AA- 10% Hispanic-30% Asian- %	White-60% AA-10% Hispanic-20% Asian-10%	Lecture-8hrs
Program G	24	Air Force Dental Clinic-24hrs	White-72% AA-6% Hispanic-11% Asian-11%	White- 60% AA-15% Hispanic-20% Asian-5%	White-60% AA-15% Hispanic-20% Asian- 5%	Several lectures-12hrs
Program H	24	Hospital- 18hrs Nursing home-6hrs	White-64% AA-3% Hispanic-13% Asian-17% Other-3%	White- 30% AA- 20% Hispanic-50%	Not provided	Lecture-2hrs Training-2hrs
Program I	20	Public Clinic-16-24hrs	White-29% Hispanic-64% Asian-7%	White- 7% AA- 7% Hispanic-86%	White-13% AA-.67% Hispanic-86% Asian-.67%	Lectures-6hrs
Program J	12	Jail- 16hrs Hospital- 8hrs School-6hrs Nursing home-1hr Public Clinic-48hrs	White-70% Hispanic-5% Asian-25%	White- 20% AA- 5% Hispanic-70% Asian-6%	White-50% AA-20% Hispanic-15% Asian-15%	2 Lectures-4hrs

Program K	8	School- 5-6hrs Nursing home- 2hrs	White- 55% AA- 1% Hispanic- 44%	White- 45% AA- 4% Hispanic- 50% Asian- 1%	White- 40% AA- 5% Hispanic- 50% Asian- 5%	Multiple lectures- 5hrs
Program L	0	None	White- 43% AA- 9% Hispanic- 28% Asian- 10% Indian- 10%	None	White- 31% AA- 9% Hispanic- 50% Indian- 10%	None

*The number of students in each program ranged from 10-35 but were not reported here in order to protect the identity of the programs.

APPENDIX I

TABLES

Table 1. Contacts with Texas Dental Hygiene Program Directors

Contact	Recipient
1. Texas Dental Hygiene Program Inventory emailed (Appendix A)	All 26 dental hygiene program directors in Texas
2. Invitational email including the site authorization template (Appendix B and C)	14 dental hygiene program directors that completed and returned the Texas Dental Hygiene Program Inventory
3. Cover letter and packet containing the proctor instructions and Clinical Cultural Competency Questionnaire Modified mailed with a self-addressed return envelope	12 participating dental hygiene programs that completed the site authorization and obtained their IRB's approval
4. Reminder email (Appendix E)	Participating program directors, if surveys not received within 2 weeks
5. Final "thank you" email (Appendix F)	All 12 participating dental hygiene program directors upon receipt of completed surveys

Table 2. Cultural Competence Training According to the TDHPI

Type of Training	# Programs Participating	Average Hours Spent by Participating Programs
Lectures and a Full Course	1	11
Multiple lectures	7	6
Lectures and special training module	2	4.75
Single Lecture	1	2
None	1	0

Table 3. Frequency Statistics for Cultural Competence Scores

Cultural Competence Scale	N*	Range of Possible Scores	Mean	Standard Deviation	Median	IQR
Knowledge	238	5-25	17.45	3.35	17	15, 20
Skill	236	7-35	25.05	5.09	25	22, 28
Comfort	238	4-20	15.82	2.99	16	14, 18
Attitude	236	7-35	28.87	3.67	29	27, 32
Overall Cultural Competence	231	23-115	87.28	11.89	88	79, 96

*Not all Ns are equal to 239 due to some questions not being answered by all subjects

Table 4. Community Experiences

Type of Community Rotation	# Programs Participating	Average Hours Spent by Participating Programs
Public Clinic	5	40
VA dental	1	36
Hospital	4	19
Religious Clinic	1	16
State School	1	16
Jail	4	13
School	6	12
Head Start	1	10
Health Fairs	1	8
Nursing Home	6	5
Air Force dental clinic	1	4
None	1	0

Table 5. Associations between Cultural Competence Scores and Hours Spent in Community Rotations

Cultural Competence Scale	Tau	p-value
Knowledge	0.154	0.001*
Overall Cultural Competence	0.124	0.009*
Attitude	0.093	0.052
Skill	0.083	0.079
Comfort	0.077	0.112

*Significant correlations with Kendall's tau correlation coefficient

Table 6. Differences in Cultural Competence Scores Based on Hours Spent in Community Rotations

Cultural Competence Scale	0-50 hours Median Score (IQR)	Over 50 hours Median Score (IQR)	p-value
Knowledge	17 (15, 19)	18 (15, 21)	0.001*
Overall Cultural Competence	85 (77, 93)	89 (81, 98)	0.006*
Skill	24 (21, 27)	26 (22, 30)	0.062
Attitude	29 (26, 31)	30 (27, 32)	0.077
Comfort	16 (13, 17)	16 (14, 19)	0.088

*Significant differences with Mann-Whitney U test

Table 7. Significant Differences in Cultural Competence Scores Based on Number of Community Rotations

Cultural Competence Scales	# Rotations	Median Score	p-value
Knowledge	4 vs. 2	20 vs. 16	<0.001
	4 vs. 0	20 vs. 16	0.002
	3 vs. 2	18 vs. 16	0.002
Skill	4 vs. 2	29 vs. 24	<0.001
	4 vs. 3	29 vs. 24	<0.001
	4 vs. 5	29 vs. 23	<0.001
Overall Cultural Competence	4 vs. 2	97 vs. 84	<0.001
	4 vs. 3	97 vs. 86	<0.001

Table 7. Continued

Cultural Competence Scales	# Rotations	Median Score	p-value
	4 vs. 5	97 vs. 85	<0.001
Attitude	4 vs. 2	31 vs. 28	<0.001
Comfort	4 vs. 2	18 vs. 16	<0.001
	4 vs. 5	18 vs. 15	<0.001

Table 8. Associations between Cultural Competence Scores and the Ethnic Diversity of Patients Seen in Program

Cultural Competence Scale	Tau	p-value
Overall Cultural Competence	0.181	0.001*
Skill	0.189	0.001*
Attitude	0.114	0.042*
Comfort	0.102	0.072
Knowledge	0.070	0.210

*Significant correlations using Kendall's tau correlation coefficient

Table 9. Significant Differences in Cultural Competence Scores Based on the Ethnic Diversity of Patients Seen in Program Clinics

Cultural Competence Scale	Diversity	Median Scores	Significant p-values*
Overall Cultural Competence	Most vs. somewhat diverse	96 vs. 85	<0.001
	Most vs. least diverse	96 vs. 86	<0.001
Skill	Most vs. somewhat diverse	29 vs. 24	<0.001
	Most vs. least diverse	29 vs. 24	<0.001
Comfort	Most vs. somewhat diverse	17 vs. 16	0.001
	Most vs. least diverse	17 vs. 16	0.014
Knowledge	Most vs. somewhat diverse	19 vs. 17	0.004
Attitude	Most vs. somewhat diverse	31 vs. 29	0.012
	Most vs. least diverse	31 vs. 29	0.013

*Significant differences using pairwise Mann-Whitney U test

Table 10. Significant Differences in Cultural Competence Scores Based on Training Hours

Cultural Competence Scale	Training Hours	Median Scores	Significant p-values*
Overall Cultural Competence	6-10 hours vs. 0-5 hours	92.5 vs. 85	<0.001
	6-10 hours vs. over 10 hours	92.5 vs. 86	0.013
Skill	6-10 hours vs. 0-5 hours	27 vs. 24	0.001
	6-10 hours vs. over 10 hours	27 vs. 24	0.008
Attitude	6-10 hours vs. 0-5 hours	31 vs. 29	0.001
Knowledge	6-10 hours & 0-5 hours	19 vs. 17	0.002

*Significant differences using pairwise Mann-Whitney U test

Table 11. Significant Differences in Cultural Competence Scores Based on Student Ethnicity

Cultural Competence Scale	Ethnicity	Median Scores	Significant p-value
Skill	Hispanics vs. Whites	27 vs. 24	0.005
Overall Cultural Competence	Hispanics vs. Whites	93 vs. 85	0.008
	"Other" vs. Whites	93 vs. 85	0.020
Knowledge	"Other" vs. Whites	21 vs. 17	0.020

*Significant difference using pairwise Mann-Whitney U test

Table 12. Student Comments and Themes for Open-Ended Questions

Theme	Responses	N
Unique experiences	• "I saw a female patient who could not be seen by my male instructor due to religious views." • "I had an experience where a patient grew up in a different country where tooth brushes and other oral hygiene products were not readily available. Once the patient moved to the states they learned how to somewhat properly care for their teeth, but were surprised to hear there were different ways to brush and floss their teeth." • "Yes, I have had a patient that needed to wear a head piece so I to adjust to their cultural beliefs and was not able to do a proper extra/intra oral exam."	64
Language barriers	• "I wish I was able to communicate effectively with Spanish only patients. I also think it is important to have someone on faculty be able to communicate too…" • "During clinic I treated an Asian woman and I had a hard time treating her due to a language barrier. I had to modify my treatment for her by using many visual resources…" • " I was assisting in my dental bay rotation and the patient was part of the deaf culture. I was able to introduce myself and knew enough to realize you have to look directly at them when speaking. It also helped that I knew some ASL. But this experience made me want to learn more dentistry ASL."	46
Cultural competence training	• "All of my experience w/ cultural competency came from hands on learning w/ my own pts in clinic and almost all of my pts out on rotations. All of my experience in clinic but MOSTLY out on rotations was ALL significant experience that I never really encountered before DH school." • "I feel that they do a great job teaching us about cultural competency & sensitivity but there's nothing like actually having a patient w/ different beliefs to teach you how to interact and plan their treatment." • "I feel our dental hygiene program prepares us well for culturally diverse patients. Sometime we are given simulation patients that give us experiences that we may have not had otherwise."	43

Table 12. Continued

Theme	Responses	N
General dental hygiene program experiences	• "I learned to work with all different types of patients in rotations." • "Best way to answer this is to say that the ONLY experience I received related w/ cultural competency was in CLINIC and on rotations. Different cultures were only briefly talked about and not a part of any full lecture. Most of the pts I saw out on rotations were from ethnic, cultural, racial, minorities and the elderly. This "on hands" experience is the best way to learn, so I have no complaints about not having an instructor actually TEACH us this stuff." • "Since my dental hygiene program is culturally diverse, I have been fortunate to interact with my classmates and learn about their cultures and beliefs, which I believe can help me better serve patients of different cultures."	37
Cultural competence issues specific to dental hygiene	• "I believe cultural competency is very important in our profession, because we will encounter many patients with a variety of backgrounds and we need to be prepared." • "Rapport trumps all cultural differences. Patients trust our judgement when they are comfortable with their clinician." • "Every dental hygienist should know how to communicate and understand every other culture out there especially in the United States, because it is a multi-cultural country."	18

APPENDIX J

FIGURES

Figure 1. Ethnic Demographics of Student Respondents According to the TDHPI

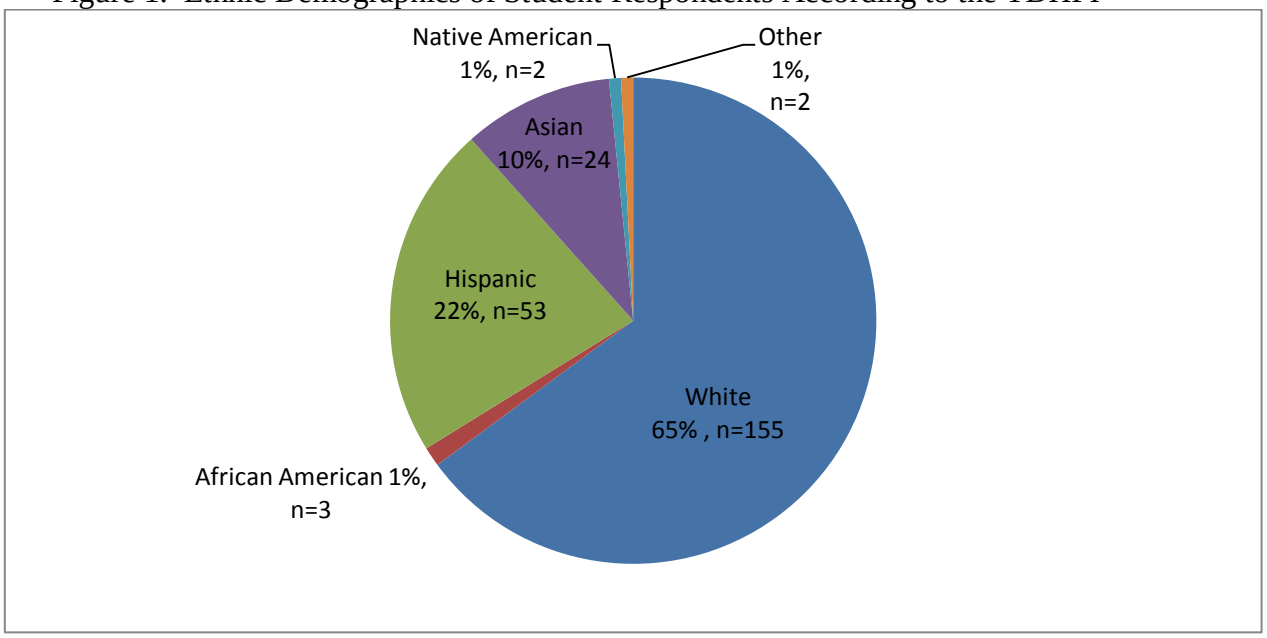

Figure 2. Collapsed Ethnic Demographics of Student Respondents

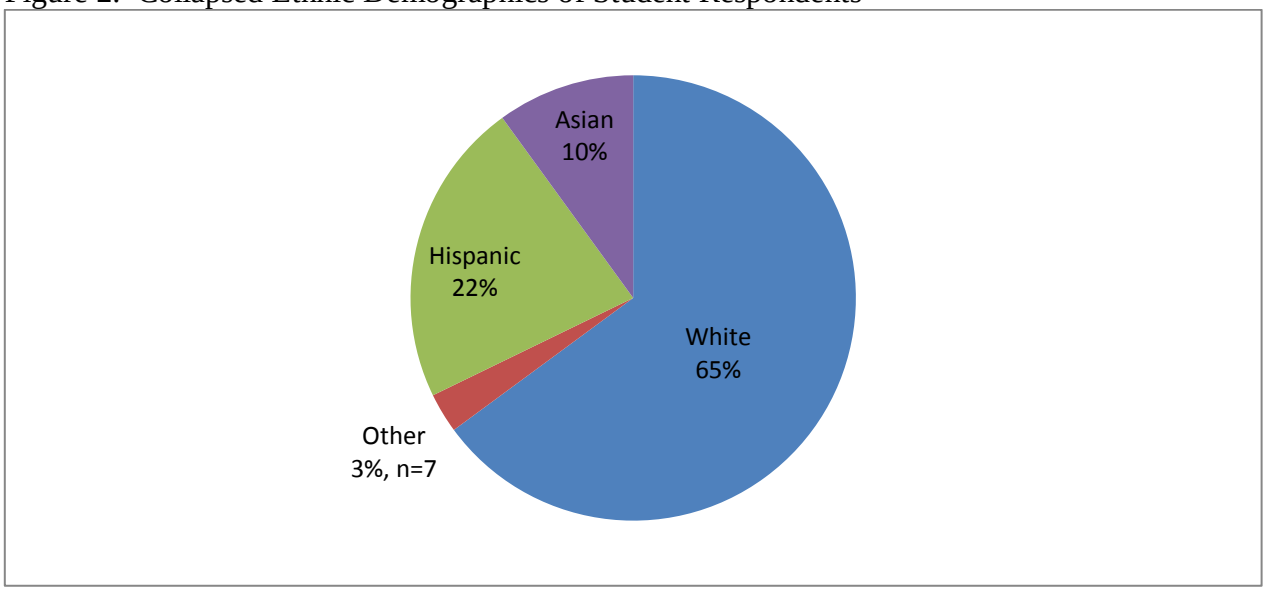

Figure 3. Ethnic Proportions of Patients in Community Rotations and Program Clinics According to the TDHPI