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Cultural Adaptability of Dental Hygiene Students in the United States: A Pilot Study

Katrina W. Magee, RDH, MS; Michele L. Darby, RDH, MS; Irene M. Connolly, RDH, MS; Evelyn Thomson, RDH, MS

Abstract

Purpose. Dental hygiene students should prepare to competently provide services to culturally diverse patients; therefore, this study was conducted as a baseline to determine the cross-cultural adaptability of dental hygiene students.

Methods. The sample consisted of 188 dental hygiene students attending four culturally diverse dental hygiene programs (N=108) and four non-culturally diverse dental hygiene programs (N=80). The culturally diverse programs randomly selected were located in the southwest, southeast and mid-Atlantic regions of the U.S., and the non-diverse programs were located in the northwest, northcentral, central, and southern regions of the U.S. Any dental hygiene program with students representing four of the five ethnic categories (Caucasian, African American, Hispanic/Latino, American Indian/Alaska Native, and Asian/Pacific Islander) with a culturally diverse student enrollment of 40% or greater, was considered a culturally diverse program; any dental hygiene program enrolling students from only one ethnic category was considered a non-culturally diverse program. Participating students completed the *Cross-Cultural Adaptability Inventory (CCAI)*, a 50-item instrument that measures an individual's cultural adaptability and its four research dimensions: *emotional resilience, flexibility/openness, perceptual acuity,* and *personal autonomy.* The instrument does not target one particular cultural, rather it is culture general, meaning the inventory is proficient in assessing all cultures.

Results. The unpaired *t*-test revealed a statistically significant difference, at the 0.05 level, in the overall, emotional resilience, flexibility/openness, and perceptual acuity between the two dental hygiene groups. Data analyses revealed the overall score of the dental hygiene students was lower than the CCAI norm group, which consisted of individuals with cross-cultural experience. The culturally diverse group scored higher than the non-diverse group in emotional resilience but scored lower than the non-diverse group in flexibility/openness and perceptual acuity. There was no statistically significant difference between the culturally diverse and non-culturally diverse groups in the dimension of personal autonomy.

Conclusion. Results of the study led to the conclusion that dental hygiene students attending culturally diverse and non-culturally diverse programs possess some qualities such as personal autonomy and self-identity needed for cultural adaptability. The overall CCAI scores were lower than the CCAI norm group suggesting students need cross-cultural education and training. For this reason, it is important that dental hygiene curricula incorporate cross-cultural educational strategies and peer and patient cross-cultural encounters to enable students to develop competency in providing cross-cultural health care.

Keywords. Cultural diversity, cross-cultural adaptability, cross-cultural competence

Introduction

Over the past decade, health care leaders in the United States (U.S.) have identified the need to develop culturally competent health care providers for a rapidly growing multicultural nation. According to the 2000 U.S. Census, the population totaled 281,421,906 and was more culturally diverse than ever. The predictions for the 21st century include an increasing growth of diverse ethnic and racial populations in small cities, the Asian population to be the fastest growing, and the Hispanic population to be the largest minority group in the U.S.[1] Changing demographics augment the demand for oral health care professionals with cross-cultural competence to communicate, educate, and treat all patients successfully. Culturally bound beliefs concerning wellness, illness, and treatment affect the outcome of professional care.[2,3] Furthermore, the lack of cross-cultural competent care can lead to invalid diagnosis and miscommunication, resulting in barriers to optimal care for culturally diverse patients.[3]

Cross-cultural competency begins with cross-cultural adaptability and education.[4,5] Entry-level dental hygiene programs need to address cultural differences present in a multicultural society. Dental hygiene students must become providers who understand how culture affects patients' health status, beliefs, and behaviors.[6] Integrating cross-cultural information and experiences into the curriculum can help students develop cross-cultural competency. However, before a dental hygiene student can provide appropriate cross-cultural health care, they must be aware of their own cross-cultural adaptability.

Cultural adaptability is influenced by various factors such as attitudes, beliefs, behaviors, interpersonal relationships, environment, education, and economic conditions. Therefore, the purpose of this pilot study was to measure the cross-cultural adaptability of U.S. dental hygiene students. Surveying dental hygiene students from culturally diverse and non-culturally diverse programs provided data to compare their overall cross-cultural adaptability, to investigate differences between the two groups, to examine if educational setting is related to cross-cultural adaptability, and to identify their strengths and weaknesses in facing a culturally diverse environment.

Review of the Literature

The American Association of State Colleges and Universities declared cultural diversity a fundamental component of general and professional studies for all students in 1985.[7] Since that time, the U.S. population has become increasingly diverse, and this issue is more of a challenge today. Colleges and universities throughout the U.S. have been working to modify core curricula to include courses that encourage students to explore, understand, and relate to cultural differences. Examples include requiring all students to obtain three credit hours of a foreign language, multicultural studies, linguistics, or religious studies before receiving a baccalaureate degree. Some areas of nursing have organized courses on transcultural care that are required for all students to help develop cultural competency in the delivery of care.[8] Students should be prepared for social, political, and economical realities that humans experience in a multicultural, competitive, and interdependent world. If students are educated in the international arena with knowledge of cultural diversity and cultural adaptation, then working in a global community with multicultural patients can be successful. Therefore, educators have a major responsibility to prepare students to live and work in a multicultural society.[9,10,11]

The U.S. Department of Health and Human Services Office of Minority Health produced a series of 14 recommendations in 2000 to be used as national standards to assure cultural competency in the organization and delivery of health care. Examples of these recommendations include: develop strategies and procedures to concentrate on ethical and legal cross-cultural conflicts in the delivery of health care; undergo annual assessments documenting the organization's progress in implementing culturally proficient practices; encourage a culturally diverse work environment; organize and implement strategies to recruit and retain culturally competent support staff, clinicians, and administrators; identify the patient's primary language and ensure information is available in their language; require and orchestrate ongoing education and training in the delivery of cross-cultural care.[12] The recommendations discussed by the U.S. Department of Health and Human Services is a proposal that health care providers need to focus on to improve health care delivery to culturally diverse patients.

Lack of cross-cultural adaptability and cultural awareness among health care providers wastes millions of dollars each year to invalid diagnoses of culturally diverse patients.[4] Cultural heritage is an important component through which both the patient and the provider can relate to health care problems, beliefs, practices, and treatment. The inability to recognize cultural differences in the health care setting leads to frustration and failure of treatment for both the patient and the provider. Understanding the patient's cultural background provides an important basis for assessing health care needs and communicating how those needs can be met.

Communicating with individuals from multicultural backgrounds is a growing challenge for health care providers across the United States. Miscommunication places barriers between the patient and health care provider. Consequently, poor communication can lead to an invalid diagnosis, a treatment plan that is insensitive to the patient's beliefs, patient noncompliance, and eventually attrition.[13] The two most critical components of communication are the message intended and the message received.[14] Providers may explain the conditions of concern and treatment options, then ask the patient, "Do you understand your condition and treatment options?" Many patients will nod or reply, "yes," and smile. This response can be interpreted in several ways—yes, they do understand everything, or it may mean yes, I hear you, I respect your decision as a health care provider, but I do not understand the condition or treatment options.

Communication is the core of the patient-provider relationship; therefore, the provider should take time to find the most effective method for communication. Recommendations to improve communication in a culturally diverse setting include employing bilingual health care providers to present more in-depth information, increasing the health care providers' understanding of legal issues within a culturally diverse environment, and providing health histories, informed consents, and educational material in the patients' languages when possible.[14] Health care providers that are attentive of their own cross-cultural adaptability and possess cross-cultural competency have the ability to listen actively, collaborate with an interpreter to assess patient needs, and define the patient's cultural orientation that drives thinking and decision-making.[13] By expressing knowledge and respect for a patient's culture, health care expectations, beliefs, and values, the dental hygienist can diminish the possibility of insulting the patient during treatment, thus increasing the probability of successful interaction, treatment, and long-term supportive care.

Morey and Leung conducted a study to describe dental hygienists' multicultural knowledge of the values, beliefs, and health care practices of Asian Americans, African Americans, Native Americans, and Hispanics/Latinos.[15] The study also investigated whether age or education influenced multicultural knowledge of dental hygienists. Thirty female dental hygienists reported treating patients from each of the four minority/ethnic groups. Results revealed no difference in multicultural knowledge according

to age, education, or years of experience among the dental hygienists; however, the dental hygienists had a low level of multicultural knowledge when working with culturally diverse patients.[15] Morey and Leung concluded that dental hygienists need more education and training on understanding, assessing, treating, and implementing care to culturally diverse patients.[15]

Health care providers should take time to complete a cultural assessment identifying cultural factors that may influence the patient's or family's behavior and responses to the health care system.[16,17] Examples of essential components of a cultural assessment include communication, time orientation, patient's personal space, management of pain, religious beliefs or customs concerning the patient's well-being, family involvement in health care decisions, health care practices such as the use of alternative and complementary medicine, and dietary practices.[16] Cultural assessment is part of a dynamic process in which the health care provider seeks to understand the patient and gain insight about the patient's perceived definition of health care and well being. However, before a health care provider can assess a patient's culture, they must first be aware of their own culture with its variability, strengths, and values, as one's own culture may influence assessment and treatment options given to patients.[16,17] Dental hygienists that are attentive of their own cross-cultural adaptability are aware of these factors and will be sensitive and non-judgmental to patients' cultural beliefs and values. Cross-cultural adaptability and awareness should be included in the dental hygiene curriculum to lead students to understand the importance of culture and the influence of culture on treatment planning and treatment facilitation.[8]

Dental hygiene educators can direct the transformation of the profession through the education process. A cross-cultural course should focus on the importance of cultural awareness and sensitivity in health care, philosophies of cultural adaptability, cross-cultural communications, cross-cultural health care theories and conceptual models, case-based cross-cultural clinical scenarios, and universality including topics concerning ethnicity, race, religion, discrimination, sexual orientation, alternative and complementary health care, and health disparities.[4,15,18,19] These topics can be explored through reading materials, clinical application, self-exploration and case studies, followed by large and small group discussions in which students share personal experiences and explore methods to improve cross-cultural health care.

Success of cross-cultural education depends on faculty defining cross-cultural competencies and incorporating, teaching, and reinforcing the concepts of cross-cultural adaptability and cross-cultural care in didactic and clinical courses.[5] Strategies to enhance cultural adaptability and faculty preparation include a review of current cross-cultural and culturally competent health care models and concepts, commitment to develop cultural competence in the dental hygiene profession, collaboration with dental hygienists and other health care providers that have experience in treating patients within a multicultural environment, and participation in cross-cultural or international conferences.

Understanding one's own cultural adaptability level is a step toward becoming a culturally sensitive and culturally competent health care provider. Students need to accept cultural differences and become conscious of how these differences influence health care delivery. Being non-judgmental, unshakable, and open-minded to the unusual is essential to cross-cultural care. When a dental hygienist can perceive a patient from the context of another culture, and recognize the patient's health care needs without being judgmental, the practitioner has achieved cultural adaptability. With cross-cultural adaptability, dental hygienists understand patients' beliefs, values, and traditions within the unique cultural context. Therefore, the purpose of this study was to determine the cultural adaptability of U.S. dental hygiene students attending culturally diverse programs compared to students attending non-culturally diverse programs. Specific research questions addressed included: What is the overall cultural adaptability level of the two groups? Is there a difference between the two groups? Does the educational setting relate to students' cultural adaptability?

Methods and Materials

Sample description

The American Dental Association (ADA) Commission on Dental Accreditation provided ethnicity data from the Survey of Dental Hygiene Education Programs in the U.S.[20] Since the time of this study, the survey has modified ethnicity categories. Any dental hygiene program with students representing four of the five ethnic categories (Caucasian, African American, Hispanic/Latino, American Indian/Alaska Native and Asian/Pacific Islander), with a culturally diverse student enrollment of 40% or greater, was considered a culturally diverse program; any dental hygiene program enrolling students from only one ethnic category was considered a non-culturally diverse program. Dental hygiene programs not meeting either criteria were excluded from the study.

Once the programs had been categorized as culturally diverse (N=15) or non-culturally diverse (N=101), two tables were developed, Table I represented all culturally diverse programs, and Table II represented all non-culturally diverse programs. To control for subject-selection bias and researcher bias, each culturally diverse and non-culturally diverse program was assigned a number, and the numbers were then entered into a table of random numbers. From these tables, four diverse and four non-diverse programs were selected. The final culturally diverse sample consisted of 108 students attending four dental hygiene programs located in the southwest (N=2), southeast (N=1) and mid-Atlantic (N=1) regions of the U.S. The non-diverse sample consisted of 80 students attending four dental hygiene programs located in the northwest, north central, central or southern regions of the U.S. The dental hygiene

Table I. CCAI Descriptive Statistics for the Culturally Diverse and Non-Culturally Diverse Groups

	Culturally Diverse Group N=108				Non-Culturally Diverse Group N=80			
Dimension	Mean	Median	Standard Deviation	Range	Mean	Median	Standard Deviation	Range
*Emotional Resilience	77.07	76	12.40	36-106	72.02	72	7.70	45-91
*Flexibility/ Openness	62.73	63	8.04	40-86	65.05	65	8.16	43-87
*Perceptual Acuity	45.08	45	5.88	32-58	47.03	47	5.14	34-41
Personal Autonomy	32.51	32	3.45	23-41	32.45	33	4.19	21-41
Overall Score	217.39	217	42.17	131-251	216.55	217	25.19	143-260

* Significantly different between two groups

programs participating in the study granted a range of professional credentials including certificate in dental hygiene, as well as associate, baccalaureate, and masters degrees.

Research Design and Data Collection Instrument

The research design controlled for extraneous variable by:

1. Selecting all dental hygiene students at each randomly selected, participating dental hygiene program to minimize subject-selection bias and research bias.
2. Assuring anonymity and confidentiality of students' responses. All data obtained were kept confidential and reported in group form.
3. Utilizing standardized written instructions for the administration of the *Cross-Cultural Adaptability Inventory (CCAI)*, at all dental hygiene programs.

The 50-item CCAI by Kelley and Meyers was used to measure the cross-cultural adaptability of students attending culturally diverse and non-culturally diverse dental hygiene programs.[21] The CCAI is a standardized culture-general instrument; however, it is not used to predict success or failure in cultural adaptability, rather it identifies ones readiness to interact with people of other cultures. The inventory assesses the ability of an individual to live and work within a cross-cultural environment by measuring four research-based dimensions of cultural adaptability—*emotional resilience, flexibility/openness, perceptual acuity,* and *personal autonomy*. Kelley and Myers describe these dimensions as follows.[21]

Table II. CCAI Descriptive Statistics by Scale for Field Testing on the CCAI Norm Group N = 653

Dimension	Mean	Median	Standard Deviation	Range
*+Emotional Resilience	79.59	79	8.28	45-103
*+Flexibility/ Openness	66.92	67	7.76	42-89
+Perceptual Acuity	46.47	46	4.96	28-60
Personal Autonomy	32.88	33	3.78	20-24
*+Overall Score	225.85	225	19.63	167-28

*Culturally Diverse Group scored lower than the CCAI Norm Group by 1 point or more
+Non-Culturally Diverse Group scored lower than the CCAI Norm Group by 1 point or more

Emotional Resilience **(18 items)**. Individuals can experience feelings of frustrations, confusion and loneliness when interacting with people from other cultures. Individuals with high levels of emotional resilience face new experiences with a positive attitude, confidence in their ability to cope with ambiguity and stress. Individuals with a high score in this dimension tend to have the courage to take risks, resourceful, possess a sense of humor and positive self-esteem.

Flexbility/Opennes **(15 items)**. Individuals, who live and work with those of other cultures, usually encounter diverse ways of thinking and behaving that are different from their own. Flexible and open individuals enjoy interacting with people from various cultures. They feel comfortable with all kinds of people, and tend to be tolerant and nonjudgmental.

Perceptual Acuity **(10 items)**. Individuals sometime find communication with persons from other cultures challenging because of confusion, assumptions, body languages and customs. Perceptually acute individuals are attentive to verbal and nonverbal behaviors and to the context of interpersonal relationships. Individuals scoring high in this dimension are accurate communicators, sensitive to their impact on others and seldom distort information based on their own beliefs.

Personal Autonomy **(7 items)**. Individuals interacting with various cultures may not encounter the type of reactions or reinforcement that they are accustomed to within their culture. Personal autonomous individuals have respect for others' beliefs and values different from their own and at

the same time have a strong sense of self-identity and self-direction. These individuals enjoy making their own decisions, are confident of their uniqueness, and can adjust to any multicultural environment.

The CCAI items related to cross-cultural adaptability, measured utilizing a six-point Likert scale, with responses ranging from "definitely true about me" to "definitely not true about me." The inventory contains nine negatively worded items throughout the instrument to reduce response bias. Responses are circled on the answer sheet and tallied on the scoring sheet to obtain scores in each of the four research-based dimensions.

Kelley and Myers established alpha reliability and construct validity through field testing the CCAI.[5] Experts in the field developed and categorized a list of skills and traits associated with cultural adaptability into the four cross-cultural dimensions. A field-testing on 635 people resulted in factor and principle component analysis shifting traits from one dimension to another, and the present instrument was published in 1992. The CCAI also contains excellent face validity, making the purpose of the instrument obvious to the people who read it and respond.

Prior to mailing the CCAI, the investigator submitted the research protocol to the Institutional Review Board for the Protection of Human Subject Approval at Old Dominion University. There were no potential risks to the participants since the research was a descriptive study and all responses were kept anonymous and confidential. All results were reported in group form. The students benefited immediately by examining their own readiness and ability to interact within a cross-cultural environment.

The CCAI inventory was mailed to each randomly selected program with a cover letter and written instructions to the dental hygiene program director. All randomly selected dental hygiene programs participated in the study. The inventories, with a cover letter to the students describing instructions for taking and scoring the inventory, were distributed during the last 30 minutes of class time. Once completed, the students had the opportunity to view their cultural adaptability scores while recording their inventory results on the circle graph, which is part of the interpretation profile sheet.

Data from the CCAI are continuous and are scaled in intervals. Data from the culturally diverse (variable 1) and non-culturally diverse (variable 2) groups were calculated separately and then examined for significant differences between the means of the two groups. An unpaired *t*-test was used to analyze for differences between these two groups in overall cultural adaptability and the four research-base dimensions. The unpaired *t*-test does not require the two groups to be paired or to be of equal size, and it is equivalent to a one-way analysis of variance when used to determine differences between the means of two groups. Line graphs were used to visualize and identify unique features among the student groups. Hypotheses were tested at the 0.05 level of significance. The computerized SPSS system for Windows was used for data analysis.

Results

A total of 188 dental hygiene students completed the inventory, for a 100% response rate. Demographically, the culturally diverse group was 47% Caucasian, 31% Hispanic/Latino, 9% Asian, 4% African American, 4% Native American/Alaska Native, and 5% other, Caribbean Black, Russian, and Haitian students. The non-culturally diverse group was 98% Caucasian, 1% African American, and 1% Native American/Alaska Native. For a comparison of each group, the mean, median, standard deviation and range were calculated for the following dimensions: overall cultural adaptability, emotional resilience, flexibility/openness, perceptual acuity, and personal autonomy (Table I). The mean, median, standard deviation, and range were calculated for each group (Table I). The unpaired *t*-test analysis identified differences between the culturally diverse and non-culturally diverse student groups, and line graphs were produced with summaries for both groups in each of the four research-based dimensions.

Overall scores

Results yielded no statistically significant difference in the overall cultural adaptability of students attending culturally diverse and non-culturally diverse programs (t=-0.12, p=0.90). A mean score was calculated for the culturally diverse group (x=217.39, sd=7.44), compared to a mean score for the non-culturally diverse group (x=216.51, sd=6.34). The students' overall cultural adaptability scores were lower than the mean score of 225.85 for the CCAI norm group. The CCAI norm group consisted of 653 persons with experience living abroad and relatively high educational levels.

Emotional resilience

The unpaired *t*-test revealed a statistically significant difference between the two groups in the emotion resilience dimension (t=3.44, p=0.00). The culturally diverse group scored a mean of 77.04, ± 12.40, which was higher than the non-culturally diverse group score of 72.01, ± 7.71. Both groups scored lower than the mean score of 79.59 for the CCAI norm group.

Flexibility/openness

In the flexibility/openness dimension, the non-culturally diverse group scored significantly higher than the culturally diverse group (t=1.94, p=0.05). The mean score for the non-culturally diverse students was 65.05, ± 8.15, as compared to a mean score of 62.73, ± 8.04 of the culturally diverse students. When compared to the mean score of 66.92 for the CCAI norm group, the dental hygiene students scored lower.

Perceptual acuity

The unpaired *t*-test revealed a statistically significant difference between the two groups in the perceptual acuity dimension (t=2.42, p=0.01). Non-culturally diverse students scored higher, with a mean score of 47.03, ± 5.14 compared to the mean

score of 45.08, ± 5.88 for the culturally diverse students. In addition, the non-culturally diverse students scored higher than the CCAI norm group, which had a mean score of 46.47.

Personal autonomy

No statistically significant difference was revealed between the two groups in the dimension of personal autonomy (t=-12, p=0.90). The mean score for the culturally diverse group was 32.51 and the mean score for the non-culturally diverse was 32.45. These scores are equivalent to the mean score of 32.88 for the CCAI norm group.

Discussion

According to Sikkema and Nijekawa, the qualities measured by the CCAI are paramount for successful cross-cultural interactions.[22] The overall CCAI scores of the dental hygiene students suggest that students need training and education on cross-cultural adaptability. Dental hygiene students possess some of the competencies, such as self-identity and respect for others, that cross-cultural experts often cite as necessary to be successful in a multicultural society; however, there are areas that need improvement such as communication skills, confidence, and critical thinking skills, when treating culturally diverse patients.

Emotional resilience

The culturally diverse group scored higher than the non-diverse group (Table I). The lower score of the non-diverse students may be attributed to the fact that these students were from programs that had either no minority students or only one minority student enrolled. These students may be located in a non-diverse area of the U.S.; therefore, they do not interact with or treat many persons from multicultural backgrounds. Both student groups fell below the CCAI norm group, suggesting that overall dental hygiene students are not competent interacting or treating persons from cultures other than their own (Table II). According to a study of health science faculty, dental hygiene faculty scored the lowest, but their scores were comparable to the CCAI norm group. The dental hygiene profession has a low number of minorities. Since emotional resilience measures the ability to fit into or adjust to a new culture, this may suggest that having little interaction or experience with people of other cultures on a daily basis can result in a lack of confidence and increased confusion when interacting with people of other cultures.[6]

Flexibility/openness

In the dimension of flexibility/openness, the culturally diverse group scored lower than the non-culturally diverse group (Table I). This dimension relates to people who have lived and worked with cultures other than their own and who feel comfortable communicating within a multicultural setting. The culturally diverse students may have scored lower because they have personally encountered limited multicultural situations and still do not feel completely comfortable. The non-culturally diverse group may have less direct interactions with individuals from other cultures, yet feel they have the skills and education to work well in multicultural situations. In addition, both groups scored lower then the CCAI norm group, thereby suggesting that dental hygiene students lack the confidence, education, or personal opportunities to develop cross-cultural competencies needed to function in health care settings (Table II). Health science faculty that have experience studying and working among culturally diverse populations in the U.S. and abroad have a higher score than the CCAI norm group.[6] According to Yoshikawa, an individual does not accept cultural difference unless he/she has personal experiences and is comfortable and nonjudgmental.[23]

Perceptual acuity

The dimension of perceptual acuity measures people who are attentive to verbal and nonverbal behaviors and to interpersonal relations. These people are highly accurate communicators and sensitive to the feelings of others. The culturally diverse group scored lower than the non-culturally diverse group (Table I). The lower score of the culturally diverse group may be attributed to personal experiences with classmates or persons from other cultures. These students may have had difficulty communicating with those of other cultures because of unfamiliar values, customs, non-verbal cues, and language. The culturally diverse students scored slightly lower than the CCAI norm group (Table I & II). The non-culturally diverse group scored slightly higher than the CCAI norm group (Table I & II). This finding may be attributed to the students' confidence that they possess the skills and education to be successful in multicultural situations. However, many of these students may have less experience communicating with individuals from other cultures, or perhaps a culturally diverse setting may not be related to perceptual acuity of the people within the setting.

Personal autonomy

There was no statistically significant difference between the culturally diverse and non-culturally diverse groups in the dimension of personal autonomy; both group scores were equivalent with the CCAI norm group (Table I & II). An explanation for the students having scores equal to the norm group may be related to their dental hygiene education. Dental hygiene students are encouraged to work and think independently, and to make evidence-based decisions. Independence is reinforced throughout their clinical education and through the personal responsibility and liability in their professional roles. Individuals scoring high in this dimension have a strong sense of personal identity, take personal responsibility for their actions, and have respect for oneself and others.[5]

Three limitations were identified as possible threats to the validity and reliability of this study. The items on the CCAI may have been answered ideally rather than how respondents actually behave when interacting with peo-

ple from cultures other than their own. Due to the small sample, dental hygiene students serving as subjects are not representative of all dental hygiene students in the U.S.; therefore, findings are limited to dental hygiene students who possess characteristics similar to those of the sample. Unfortunately, situational-relevant difference during the administration of the inventory could not be controlled due to the different dental hygiene programs involved throughout the U.S. To decrease this threat to internal validity, each inventory was accompanied with directions explaining the significance of the study and instructions for taking the CCAI. Recommendations for future studies include:

1. Replication of the study using a larger sample to determine if geographic location is associated with cross-cultural adaptability
2. Longitudinal exploration using the CCAI as a pre-test and post-test to determine if cross-cultural training and education increases dental hygiene students' cross-cultural adaptability
3. An investigation using the CCAI as a pre-test and post-test to determine if personal encounters or experience with culturally diverse patients increases students' cross-cultural adaptability

According to this study, dental hygiene students, on average, had lower scores than the CCAI norm group, hence they need more education and personal experiences to develop competencies in cross-cultural adaptability. Several strategies can help students develop cultural adaptability. Some examples are: critically viewing multicultural health care setting video tapes and analyzing case studies of culturally diverse patients to encourage discussion and critical thinking, reading international journals, participating in exchange programs and scheduling speakers that have experience treating patients abroad, and experience treating patients who practice alternative or naturalistic health care methods.[22]

Technology and global communication offer dental hygiene students a new strategy for achieving cultural adaptability. Health care professionals may participate in study groups (chat rooms) worldwide via the Internet. When they seek to identify the best approach for cross-cultural care, they can discuss the patient's case with the study group and participate in telemedicine and teledentistry systems.[24] This strategy allows health care professionals to develop cross-cultural treatment plans and implement care within each patient's cultural context. Through these experiences, students can learn about other cultures, become skilled in providing culturally sensitive care to patients, and collaborate with professionals worldwide to improve health care.

Conclusion

Results of this study lead to the conclusion that dental hygiene students attending culturally diverse and non-culturally diverse programs possess some qualities such as personal autonomy and self-identity needed for cultural adaptability; however, the level of cultural adaptability is lower than the CCAI norm group for both student groups. The cross-cultural adaptability of dental hygiene students is not related to the diversity of the dental hygiene program in which they are enrolled. Furthermore, the non-culturally diverse students feel less confident and knowledgeable when faced with a new cultural environment, and the culturally diverse students have difficulty feeling comfortable and communicating in multicultural situations. The similar personal autonomy scores between the two groups suggests that dental hygiene students have a strong sense of identity, responsibility, and respect for people of different cultures.

Dental hygiene students should possess cross-cultural adaptability. Being aware and adjusting to cultural differences when developing treatment plans can enhance patient trust in the provider and increase success of long-term treatment. For this reason, dental hygiene curricula should incorporate educational strategies, training and personal encounters with people of diverse cultures to provide students with the experience and competence needed to be successful in a multicultural society.

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The American Dental Hygienists' Association (ADHA), a not-for-profit, national, professional association, has an immediate opening for a **director of research**. The successful candidate for this position should have research experience and be a licensed dental hygienist with a minimum of a master's degree. Strong consideration will be given to candidates with association experience, which includes working with a non-profit board. Strong oral and written communications skills and a familiarity with analytical computer software is a must.

The director of research will report to the executive director and will be responsible for managing staff and projects in the research division. Major responsibilities of this position include:

- preparing research grant proposals for consideration by government and private agencies;
- managing grant monies and preparing associated reports once a grant has been received;
- surveying and analyzing the impact of public and private policy on the dental hygiene profession;
- gathering and analysis of data for the development of association position statements; and
- providing technical assistance to ADHA members and staff concerning research and dental hygiene education and practice.

Salary is commensurate with background and experience. Interested parties should send a comprehensive cover letter outlining qualifications, resume, salary requirements, a list of three current references, and a writing sample in confidence to:

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