

Use of the Cross-Cultural Adaptability Inventory to Measure Cultural Competence in a Dental Hygiene Program

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Introduction

The American Dental Education Association (ADEA) resolution 12H-2000 states that “All dental education institutions should include cultural and linguistic concepts as an integral component of their curricula to facilitate the provision of oral health services.”¹ The American Dental Association’s 2001 *Future of Dentistry* report supports this concept with its Education Recommendation 13: “The education community should enhance undergraduate exposure to the ethics of dental practice while also providing cultural competency that provides information and training on delivering care to all segments of the population.”² The report of the Surgeon General points to the need for a culturally competent dental workforce to increase access to care and enhance oral health.³ All of these recommendations are in response to the changing demographics in the United States, where current minority populations are projected to increase to near half the population in 2050.⁴

The educational community has responded by incorporating effective communication with individuals from diverse backgrounds into their competencies for dentists and dental hygienists.^{5,6} A position paper by the ADEA addresses the important role dental and allied dental educational programs have in not only producing a workforce but producing a “diverse and culturally competent workforce ... to meet the oral health needs of the nation.”⁷ Specifically, institutions

Abstract

Purpose: The purpose of this study was to determine changes in students’ cross-cultural effectiveness using the Cross-Cultural Adaptability Inventory (CCAI™). The inventory assessed strengths and weaknesses in 4 skill areas: Emotional Resilience, Flexibility/Openness, Perceptual Acuity, and Personal Autonomy.

Methods: The CCAI™ was administered to 30 dental hygiene students during Orientation. Age and dental assisting experience were recorded to determine if those variables affected skill areas. The inventory was re-administered at the end of the first and second years of the program. Data from the 3 time periods were analyzed using t-tests ($\alpha=0.05$) for the 4 skill areas. These scores were totaled and used to determine differences due to dental assisting experience or age.

Results: T-tests found no significant differences ($\alpha=0.05$) for the 4 skill areas and for total scores between administrations of the inventory. Age and dental assisting experience did not affect results.

Conclusions: No significant improvement in students’ cross-cultural effectiveness over the course of the 2-year curriculum was determined using the CCAI™. Results of each student’s performance, however, were not shared until graduation. Sharing results earlier would have allowed students to identify strengths and weaknesses in their cross-cultural effectiveness. This knowledge may have motivated them to improve their skills when exposed to patient experiences and curricular content promoting cross-cultural effectiveness. Programs which decide to use this inventory may want to consider using a strategy of surveying and sharing results at appropriate points during the curriculum.

Key Words: cultural competence, diversity, dental hygiene

are urged to prepare their graduates to address the needs of an “aging population, a racially and ethnically diverse population, and individuals with special needs.”

Review of the Literature

A 2004 survey of pre-doctoral dental schools found that 80% had

increased the amount of cross-cultural teaching in the 5 years prior to the survey.⁸ Hours devoted to teaching ranged from under 5 to over 40. The survey also found that 90% reported diverse patient population as the reason for teaching cross-cultural issues. Recommendations to the educational community included sharing teaching and evalu-

ation methods used by schools. A separate study using ADEA survey data collected from 52 responding schools concluded that the majority of graduating dental students were prepared to treat a diverse population of patients, but 25% felt more time should be devoted to this subject.⁹

A variety of techniques can be used to assess cultural competency. A study regarding the teaching and evaluation of dental students' interpersonal and cultural sensitivity skills found the use of instructors to simulate a patient's illness/condition effective in teaching interpersonal communication. Likewise, providing education and evaluations of students' interviewing skills increased effectiveness in interpersonal communication.¹⁰

Other means to evaluate cultural sensitivity and interpersonal skills include the use of surveys and inventories. A recent review of a dental program's development and cultural competency curriculum used a survey developed at their institution for D1 and D2 classes. The survey was administered before and after exposure to cultural competency content to determine knowledge acquisition.¹¹ Other instruments used to measure multicultural competence are commercially available. The Multicultural Counseling Awareness Scale, Multicultural Awareness-Knowledge-and-Skills Survey, and the Graduate Students' Experience with Diversity have been evaluated for reliability and validity.¹² The instrument for graduate students was found to be appropriate for that population while the Multicultural Counseling Awareness Scale was recommended for general use.

Dental hygiene has embraced the need for integrating cultural competency into the dental hygiene process of care,¹³⁻¹⁵ and a commercially available instrument, the Cross-Cultural Adaptability Inventory (CCAI™),¹⁶ has been used by dental hygiene researchers.^{17,18} This

inventory evaluates cultural adaptability (ability to adapt to living in another culture and to interact effectively with people of other cultures) by measuring Emotional Resilience, Flexibility/Openness, Perceptual Acuity, and Personal Autonomy. A 6-point scale ranging from 'definitely true' to 'definitely not true' was used when responding to the 50 statements that make up the inventory. In one study, the CCAI™ was used to determine the cultural adaptability of faculty in 4 health science disciplines: dental hygiene, medical laboratory science, nursing, and physical therapy.¹⁷ The premise was that if faculty members are expected to teach cultural competency to their students, they should know something about their own cross-cultural adaptability. Although no significant differences were found in their overall scores, some differences were found between health science disciplines. However, the total mean scores of the entire faculty were found to be higher than the CCAI™'s normative sample (a group with high educational levels and experience living abroad). In a separate study, the CCAI™ was used to determine cross-cultural adaptability of dental hygiene students attending culturally diverse and non-culturally diverse programs and to make comparisons between them within the 4 skill areas.¹⁸ Although overall cross-cultural adaptability scores were not found to be significantly different, the culturally diverse group scored significantly higher in Emotional Resilience while the non-culturally diverse students scored higher in Flexibility/Openness and Perceptual Acuity (empathy, attentiveness to interpersonal relations). Overall, total CCAI™ scores for all dental hygiene students surveyed were found to be lower than the CCAI™ normative sample. In order to be successful in a multicultural society, this study's authors recommended dental hygiene curricula to include "educational strategies,

training, and personal encounters with people of diverse cultures" and encouraged "using the CCAI™ as a pre- and post-test to determine if cross-cultural training and education increases dental hygiene students' cross-cultural adaptability."

While the focus in the last decade has been to increase diversity and cultural training in dental hygiene programs, little is known on how effective these initiatives are in improving or changing dental hygiene students' cultural sensitivity. Studies have examined cross-cultural adaptability at a single point in time, but no study has used the CCAI™ to determine changes over time. The purpose of this study was to determine changes in dental hygiene students' cross-cultural effectiveness using the CCAI™ before, during, and after dental hygiene instruction, which included didactic and clinical encounters with diverse populations.

Methodology

The CCAI™ developed by Kelley and Meyers was used in this study. The inventory was designed to meet a variety of needs, which included increasing self-awareness of qualities that affect cross-cultural effectiveness and using the results to improve interaction skills with people of other cultures. The inventory assessed strengths and weaknesses in 4 skill areas: Emotional Resilience, Flexibility/Openness, Perceptual Acuity, and Personal Autonomy:

- Emotional Resilience: ability to cope, react positively to new experiences, and deal effectively with feelings of culture shock
- Flexibility and Openness: acceptance of others who are different and comfortable with all kinds of people
- Perceptual Acuity: reflects empathy, attentiveness to interpersonal relations, and verbal and nonverbal behavior
- Personal Autonomy: respect for others while feeling secure with

own identity

The inventory is considered to have face validity (apparent what the instrument is designed to do), content validity (covers the subject matter in question), construct validity (extent to which the instrument measures a trait), and an overall reliability of 0.90.¹⁶

The inventory was administered 3 different times during the students' 2-year program. Students were asked to supply a 6-digit code and the name of a teacher or pet only they would know in case they lost the code during administrations of the survey. This was also done so the inventories could be returned to each student upon graduation. In addition, students were asked to record their age and whether they had been a dental assistant. Inventories were collected in such a way as to protect students' identities. Each inventory was then scored according to the CCAI™ directions and a total for each of the 4 areas was determined.

The first administration of the inventory was given to 30 students entering their first year at the Caruth School of Dental Hygiene during Orientation (fall 2005), but before a diversity workshop provided later that week. The Caruth School of Dental Hygiene has relied on a 4 hour diversity workshop, "Building Bridges for Better Health Care," during Orientation week to initiate cultural competency instruction. The workshop focuses on stereotypes, experiences with discrimination, and verbal and nonverbal communication and relates these topics to the delivery of care to diverse groups. During the second semester, while students are seeing patients in Clinical Dental Hygiene I, a 2-hour lecture on cultural competence in the Health Education and Behavioral Science was offered. The inventory was re-administered at the end of the first year of the program. However, 3 surveys were not able to be used. Two students changed to the part-time program (increasing the

length of their program by 1 year) and responses on 1 survey made it unusable for making comparisons. Paired t-tests ($\alpha=0.05$) were used to determine if significant differences in the 4 areas occurred between the first and second administrations of the inventory and to determine if differences were due to the age or dental assisting experience of the students.

During the second year of the program, students participated in a variety of rotations aimed at exposing them to various ethnic, socioeconomic, and special needs populations. They also received a 90 minute cultural competence lecture with class participation in the Public and Community Health course (students investigated different populations and developed reports on how those differences could impact care). Courses such as Gerontology, Pediatric Dentistry, and Theory of Dental Hygiene, which address patients with special needs, also support the students' knowledge of these different populations during the second year. Students completed the third administration of the CCAI™ at the end of the second year of the program (spring 2007) and were asked again to use their secret code for tracking purposes. One student did not complete the second year, which brought the sample size to 26. Paired t-tests ($\alpha=0.05$) were used to determine if significant differences in the 4 areas assessed by this inventory occurred between the first and third administrations and to determine if any differences were due to the age or dental assisting experience of the students.

Results

No significant differences were found in the 4 skill areas between administrations of the inventory for the 26 students completing all 3 inventories (Table 1). The total score for the 4 skill areas also showed no significant change. Three of the 4

skill areas showed some improvement, with Perceptual Acuity exhibiting the most change. One skill area, Emotional Resilience, showed no improvement in the average score between any administrations of the inventory. Age and dental assisting experience did not significantly affect students' skills in the 4 areas measured. For comparative purposes, normative sample scores reported by the authors of the CCAI™ Manual are included in Table 1.¹⁶

Discussion

Emotional Resilience and Personal Autonomy were expected to be high at the baseline with little possible increase. This was due to students already maturing during their first 2 years of college before entering into the program. Perceptual Acuity, the area that increased the most, would seem to be the most likely affected, due to a program's curricular impact. In this program, students begin seeing each other as 'patients' during the first semester and observe the second-year class in clinic. They also receive lecture material on cultural competency and on communication skills, stress, and coping. Perceptual Acuity was expected to further increase due to additional didactic instruction and clinical experiences that brought students in contact with a variety of patient populations during their second year. It was also anticipated that Personal Autonomy would increase due to a growing sense of achievement students might feel as they near graduation, Emotional Resilience would increase due to a sense of accomplishment and ability to cope as they completed the curriculum, and Flexibility and Openness would increase because of the many experiences students had encountering different patient populations. While it was expected that there would be a significant increase in the students' cross-cultural capacity, as measured by the CCAI™

Table 1. CCAI™ Scores for 4 skill areas and normative sample analyzed with a t-test for paired samples

Four Skill Areas	Administration 1 (Baseline)	Administration 2 (end of first year)	Administration 3 (end of second year)	Normative Sample (N=653 CCAI™)
Emotional Resilience	82.8 ± 7.5	82.2 ± 8.0	82.8 ± 7.7	79.6 ± 8.3
Flexibility/ Openness	67.1 ± 6.9	66.7 ± 6.9	67.4 ± 5.7	66.9 ± 7.7
Perceptual Acuity	45.3 ± 5.4	47.0 ± 5.0	47.1 ± 4.4	46.5 ± 5.0
Personal Autonomy	34.9 ± 3.5	34.7 ± 3.7	35.7 ± 2.9	32.9 ± 3.8
Total	230.2 ± 18.3	230.5 ± 17.4	233.0 ± 16.0	225.9 ± 19.6

between the first and third administrations of the survey, no significant differences were found.

One explanation could be that scores were already high when students entered the program due to the number of high achievers entering the dental hygiene class, their selection of a totally new environment, and their desire to help people. Considering this possibility, the inventory may not have been sensitive enough to determine slight changes in attitudes. As seen in Table 1, baseline scores for Emotional Resilience, Personal Autonomy, and the total overall score for the dental hygiene sample were higher than the normative sample reported by the CCAI™ manual. These results differ from the results of other researchers who made comparisons among CCAI™ normative sample scores and scores from diverse (4-5 ethnicities represented by ≥40% of enrollment) and non-diverse (only 1 ethnic category) dental hygiene programs.¹⁸ Only the Perceptual Acuity score in the study for non-culturally diverse groups was found to be higher than the normative sample. Reasons for differences in how students' scores compared to the normative sample could be due to differences in program types, geographic location, and lack of diversity. The present study's class diversity did not meet the diversity criteria for either category used by

previous researchers.

Another explanation for a lack of significant change is more directly related to how the inventory was used. The CCAI™ is an instrument designed to assess skills and make the person aware of weaknesses through feedback. Awareness of weaknesses can motivate people to improve in those areas and plan for self-improvement. In this study, students were not given that opportunity. Inventories were held until the end of the study and students were not aware of their weaknesses. Therefore, they could not develop a plan for self-improvement.

Sample size could also be a reason for a lack of significant results. Since this study followed only 1 class of students, it is limited in its application of findings. Curriculum changes during the course of this longitudinal study prevented assessment of additional classes. Finally, the lack of any statistical significance may be due to the program's curricular content simply not being effective enough to affect change in student attitudes.

Conclusion

The CCAI™ is an instrument designed to increase self-awareness of a person's potential for cross-cultural effectiveness. The inventory was used to determine if a dental hygiene program's curriculum af-

fects improvement in the students' cross-cultural effectiveness. No significant improvement was found. Inventory results and scoring, however, were not shared with students until graduation. An approach wherein sharing results as each inventory is completed would allow students to identify strengths and weaknesses in the 4 skill areas. It is recommended that programs that decide to use this inventory strongly consider sharing the results during the program. In this way, students could use the information and experiences provided by the curriculum to improve their skills in any weak areas identified by the inventory.

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are our future and we must keep the scholarly activity moving forward. Congratulations to the three dental hygienists listed below who won the Inaugural DENTSPLY/ADHA Graduate Dental Hygiene Research Award.

Be on the lookout for the next issue of the Journal of Dental Hygiene. The entire issue will be the publication of the Proceedings of the North American Dental Hygiene Research Conference held in June, 2009. You will not want to miss it.

Have a great summer!

Sincerely,

Rebecca Wilder, RDH, BS, MS
Editor in Chief, Journal of Dental Hygiene