A Retrospective Analysis of the Cultural Competence of Chiropractic Students in a Public Health Course

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Purpose: Diverse communities require chiropractors to be culturally competent to serve diverse populations. The purpose of this analysis is to describe the effect on knowledge and confidence to serve diverse populations following 6 hours of cultural competency training. **Methods:** Using a quasi-experimental one-group design, a paired t-test using a 40-item questionnaire to assess knowledge and a 15-item questionnaire to rate confidence was used for the stated purpose. **Results:** A total of 45 students completed the 40-item questionnaire and 48 students completed the 15-item questionnaire. Analyses showed significant increases from pre-to post-training (Δ score = 21.34%; $p < 0.001$) in knowledge to serve diverse populations; but in confidence no significant change was found (Δ score = 0.24; $p = 0.26$). However, when accounting for sex differences, female students showed a significant increase in confidence with 7 of the 15 items at $p < 0.05$, while male students did not achieve significant changes in any of these items. **Conclusions:** The knowledge of chiropractic students increased significantly following a course in cultural competence. Their confidence to serve diverse populations, however, did not change significantly. Further examination of the data revealed that baseline measures on confidence may be relatively high. Further study is required to determine the covariates of successful training in cultural competency.

Key Indexing Terms: Chiropractic; Cultural Competence; Education

INTRODUCTION

The people of the United States have traditionally been described as forming a *melting pot* or a *mosaic* of cultures. The United States has been described as a *nation of immigrants*. This cultural diversity has existed since people—Europeans, African Americans, Hispanics, Asians, and others—began immigrating to the Americas. According to the US Bureau of the Census, racial and ethnic minority groups (i.e., Asian American, Black or African American, Hispanic or Latino, Native Hawaiian and other Pacific Islander, American Indian and Alaska Native) in the United States are projected to account for approximately half the population by 2050.[1,2] By 2050, one in five Americans will be an immigrant, with Hispanics making up 29% of the US population while the non-Hispanic white population will become a minority group at 47%.[2,3] This change in population demographics may be attributed to continuing immigration by these minority groups from their countries of origin (i.e., Hispanics from Cuba, Mexico, Puerto Rico, South America, or Central America)[1] or the birth rates of these population groups in the United States surpassing their mortality rates.

Regardless of the source of this trend, the different languages, beliefs, cultures, and traditional health and illness practices of these people from various ethno-cultural communities may lead to increased health disparities and decreased access to care[4]. Furthermore, a healthcare provider's biases, stereotypes, and prejudices toward these people may potentially contribute to racial disparities in healthcare.[5]

Cultural competence in health care has been defined as, "...understanding the importance of social and cultural influences on patients' health beliefs and behaviors; considering how these factors interact at multiple levels of the health care delivery system... ."[6,7] A *Healthy People 2020* objective is for 100% of healthcare-provider degree-granting institutions to include cultural diversity education in their curriculum.[8] Chiropractic is a large and well-established healthcare profession in the United States. The profession continues to expand globally by improving its educational and licensing systems in various countries and substantially increasing its market share.[9] Therefore, it is reasonable to expect that future and current chiropractors also need to learn skill sets through cultural competency education. To further explore the nature of cultural com-

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Table 1. Examination: Students' knowledge in cultural competency α.

	Pre-training		Post-training		Pre-Post-change	
	Mean ± SD	Range β	Mean ± SD	Range β	Change Score	*p* Value
40-item cultural competency examination scores (%)	42.93 ± 6.86	30–60	64.27 ± 12.74	40–90	21.33	< 0.001

α. All scores were recorded as percentage correct (paired).

β. Range were percentage recorded from a possible 0–100% (unpaired).

petency education for chiropractic students, this analysis describes the findings on the modification in knowledge and confidence of cultural competency in chiropractic students following a 6-hour training session.

METHODS

As part of a chiropractic college curriculum in public health, third-year chiropractic students were required to complete a 6-hour cultural diversity lecture and classroom exercises adapted from a course offered in the University of California, Los Angeles School of Public Health program.[10] The 6 hours of content were offered in 2-hour sessions on a Tuesday, Wednesday, and the following Tuesday, according to the class schedule. The course content on cultural competency was comprised of three parts:

1. Lecture on concepts of culture, ethnicity, religion, and socialization; the diversity of the US population, concepts of health and illness, and health traditions.
2. Lecture on healing traditions, delivery of health care in the United States, cultural phenomena affecting health care, morbidity/mortality comparison and health and illness in the American Indian and Alaska Native populations, the Asian population, the black population, the Latin/Hispanic population, and the white population.
3. A series of classroom exercises and a cultural diversity video exposed the participants' cultural blind spots, biases, and preconceptions along with an examination of possible solutions to improve the participants' cultural competence.

The impact of the training was assessed using a quasi-experimental, one-group design that involved the administration of brief pre-and post-training surveys. The surveys consisted of two parts: the first was of a 40-item questionnaire to assess the knowledge gained by chiropractic students on cultural diversity as described above, and the second was a 15-item questionnaire that rated the student's perceived confidence to serve patients of diverse populations. The rating utilized a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree). The confidence survey instrument was originally developed by Assemi, et al[11] to assess changes in confidence among pharmacy students; it was refined by Muzumdar, et al.[12] The questionnaires have not been shown to be valid or reliable. Permission was granted to use the 15-item questionnaire.

The examination scores for each student participant were entered into SPSS Version 19 software (IBM, Chicago, IL). Using a paired t-test, the impact of the 6-hour course as a function of within-student change scores was estimated.

RESULTS

A total of 45 students (22 males, 23 females, mean age 28.7 years) of a possible 50 (response rate = 90%) completed the 40-item questionnaire, and 48 students (23 males: 25 females; mean age of 28.0 years) completed the 15-item questionnaire (response rate = 96%).

Analysis of the 40-item cultural competency questionnaire showed the student scores for all items increased significantly from pre-to post-training (pre-training mean score = 42.93 ± 6.86; post-training mean score = 64.27 ± 12.74; paired t-test: $t_{calc} = 9.41$; $p < 0.001$) (Table 1). When evaluating for sex differences, female (pre-training mean score = 43.23 ± 7.90; post-training mean score 67.70; paired t-test: $t_{calc} = 6.97$; $p < 0.001$) and male students (pre-training mean score = 42.64 ± 5.74; post-training mean score 60.68; paired t-test: $t_{calc} = 6.58$; $p < 0.001$) improved significantly.

Analysis of the 15-item confidence questionnaire revealed the student scores for all items did not change significantly from pre-to post-training (pre-training mean score = 3.64 ± 0.91; post-training mean score = 3.88 ± 0.96; $p < 0.26$) (Table 2). However, when accounting for individual items in the 15-item questionnaire, 4 of the 15 items (items 3, 7, 10, and 12) resulted in a significant change at $p < 0.05$. Additionally, female students showed significant changes in 7 of the 15 items at $p < 0.05$ (items 3, 7, 10, 11, 12, 13, and 14) while male students did not achieve significant changes in any of the items.

DISCUSSION

Including cultural information about traditional health beliefs and how it impacts competency in health-

Table 2. Survey item: Students' confidence in cultural competency α.

	Rate how confident you are about the following statements: β	Pre-training		Post-training		Pre-Post-change	
		Mean ± SD	Range	Mean ± SD	Range	Change Score	*p* Value
Item 1	You can elicit patients' opinions, beliefs, and values about chiropractic care and treatment when counseling a patient	4.00 ± 0.68	2–5	4.17 ± 0.93	1–5	0.17	0.252
Item 2	You can elicit patients' beliefs about their health and illness	4.02 ± 0.79	1–5	4.06 ± 0.95	1–5	0.04	0.761
Item 3	You can elicit patients' customs and healing traditions	3.21 ± 0.87	2–5	3.77 ± 0.90	1–5	0.56	0.001
Item 4	You can assess the presence of language barriers	3.69 ± 1.09	1–5	3.88 ± 1.10	1–5	0.19	0.202
Item 5	You can assess patients' literacy skills	3.52 ± 0.95	1-5	3.73 ± 0.98	1–5	0.21	0.268
Item 6	You can acknowled e the diverse health beliefs of patients	3.60 ± 0.87	1–5	3.85 ± 0.87	1–5	0.25	0.09
Item 7	You can elicit how patients' health decisions are made	3.44 ± 0.97	1–5	3.88 ± 0.87	1–5	0.44	0.01
Item 8	You can develop rapport with all patients regardless of their cultural background	4.02 ± 0.76	1–5	4.15 ± 0.82	2–5	0.13	0.371
Item 9	You can communicate to patients your understanding regarding their condition and illness	3.96 ± 0.81	2–5	4.04 ± 0.98	1–5	0.09	0.577
Item 10	You can obtain the resources of an interpreter when it is needed	3.40 ± 1.18	1–5	3.81 ± 1.02	1–5	0.42	0.007
Item 11	You can effectively use a skilled interpreter	3.73 ± 0.94	1–5	3.98 ± 1.10	1–5	0.25	0.103
Item 12	You can effectively use an unskilled interpreter	3.02 ± 1.00	1–5	3.63 ± 1.10	1–5	0.6	0.001
Item 13	You can recognize and effectively respond to cultural conflicts	3.54 ± 0.85	1–5	3.79 ± 0.92	1–5	0.25	0.083
Item 14	You can effectively secure information and resources to better serve culturally diverse patients	3.69 ± 0.90	1–5	3.85 ± 0.87	1–5	0.17	0.33
Item 15	You can assist uninsured or underinsured patients to access needed care	3.72 ± 1.02	1–5	3.68 ± 1.04	1–5	-0.04	0.811
	Total	**54.56 ± 13.68**	**18–75 γ**	**58.29 ± 14.45**	**16–75 γ**	**3.73**	**3.867**
	Current study's mean δ	3.64 ± 0.91		3.88 ± 0.96		0.24	0.26
	Assemi et al's[11] mean δ	2.78 ± 0.46		3.99 ± 0.41		1.21	< 0.001
	Muzundar et al's[12] mean δ	2.27 ± 0.99		3.24 ± 0.91		0.97	< 0.01

α. Chart was adapted from Assemi's 12-item survey[11] and Muzumdar's 15-item survey[12] for comparison.

β. Individual item range from 1 = Strongly Disagree to 5 = Strongly Agree.

γ. Possible range for pre- and post-training total scale scores is 15–75.

δ. The mean of all pre- and post-training scores.

care delivery has been successfully integrated into many different healthcare discipline curricula.[11–23] Students attending medical, dental, nursing, and pharmacy programs have cultural competency integrated into their educational experience to increase their awareness of cultural diversity and improve their cultural competency. Beach, et al[24] conducted a systematic review of the literature and concluded that cultural competence training can improve knowledge, attitudes, and skills in healthcare professionals. High scores have been achieved in characteristics/virtues such as compassion and wisdom,[17] improved empathy for patients from diverse cultural and socioeconomic backgrounds,[22] and provided students an appreciation and great value in their cultural competency courses to prepare them to provide care to diverse patient populations.[21,23]

The 6-hour cultural competency educational program described in this analysis was part of a core curriculum public health course and comparable to the other healthcare institutions' varied curricula. In 2005, Beach et al's[24] review of 34 studies reported instructor-to-student contact times varied from as short as two 2-hour sessions to as long as 30 half-day sessions over 1 year for a course in public health. A survey of 53 dental schools found that 82% of the respondents did not offer a course devoted entirely to cultural competency education.[25] Assemi, et al[11] offered an 8-hour elective course on basic cultural competency through the use of didactic lectures, classroom activities, and discussions to pharmacy students. Lim, et al[26] found that a 2-hour presentation could have a positive impact on first-year medical students on cultural issues in patient care.

To provide further background and context in the discussion on chiropractic and cultural competence, a review of the literature was performed. The databases PubMed, MANTIS, and Index to Chiropractic Literature were searched using the subject headings "manipulation," "chiropractic," "chiropractic education," and "chiropractic instruction" in Boolean combination with the words "cultural competency" and "cultural education" with subheadings "cross-cultural communication" and "cultural diversity." No date limits were applied. The inclusion criteria for the current analysis included articles addressing the subject as described and published in English language, peer-reviewed journals. No publications on the subject were identified. Two conference proceeding presentations were published in the *Journal of Chiropractic Education*. Killinger[27] developed a course on cultural competency from several educational centers and Internet resources. It was implemented in 3 cohorts of 9th trimester chiropractic students and also was shared with faculty. According to Killinger, "students realize that their naivety in the area of cultural competency may have negatively impacted their ability to successfully and appropriately interact with patients." Threinen[28] describes the types of computer-mediated distance learning models available to chiropractors to learn cultural competency. Unfortunately, Threinen provides no results with this mode of learning but describes its benefits, such as expanded accessibility and savings in time and resources.

The current study is thought to be the first to have examined the knowledge and confidence of chiropractic students in the context of cultural diversity. The findings showed that a student's knowledge of cultural competence could be significantly improved through the use of a combination of lecture, video, and classroom exercises of 6-hours' duration. An increase was found in chiropractic students' knowledge of various cultures and ethnicity, religion and socialization as well as in their concepts of health and illness and health traditions. The students were able to appreciate the healing traditions of various cultures within the context of the US healthcare delivery system and the chiropractic paradigm of health.

With respect to the chiropractic students' perceived confidence to serve patients of diverse populations, a significant change was not found. There was questionable validity in the ability to conduct a comparison with the two published studies using the same questionnaire[11,12] because the cultural competency content and method of delivery were different in addition to varying student populations (i.e., chiropractic vs pharmacy students). Nonetheless, the results of the current study are inconsistent with those of previous studies. Assemi, et al[11] found that pharmacy students' confidence significantly increased from pre-training and comparative as did Mazumdar, et al[12]. *Ceteris paribus*, "all other things being equal," the pre-training average confidence score was 2.78 ± 0.46 and 2.27 ± 0.99 for the Assemi and Mazumdar studies, respectively. The pre-training average confidence score for the chiropractic student population in the current analysis was 3.64 ± 0.91. It appears the pharmacy students' perceived confidence to serve patients of diverse populations was much lower than those of the chiropractic students. The pharmacy students' post-training confidence levels were 3.99 ± 0.41 and 3.24 ± 0.91 in the Assemi and Mazumdar studies, respectively. These values are comparable to the pre-training confidence levels of the chiropractic students. Future studies should examine the nature of these findings. For example, is the confidence to deal with diverse populations from the onset of education a unique characteristic of chiropractic students. or is this unique to the pharmacy student population? Future studies should also examine the cultural competency of practicing chiropractors and ways to improve these skill sets in students and practitioners.

The Council on Chiropractic Education (CCE), the accrediting agency recognized by the US Department of Education for accreditation of programs and institutions offering the Doctor of Chiropractic degree, and its international counterpart (CCE International), are undergoing changes to ensure the quality of chiropractic education. These changes involve a philosophic

shift to measuring outcomes that require graduates to demonstrate mastery of the skills necessary to function as a practicing professional. As such, chiropractic programs will be required to demonstrate that students have acquired the knowledge, skills, and attitudes set by individual college's curricula. Baseline and comparative testing must be performed to gauge and demonstrate what a student has learned.[29] The current study is congruent with these new educational standards while simultaneously demonstrating the need to train culturally competent chiropractors.

The results of this study had several limitations. No standard curriculum is thought to exist for cultural competency in chiropractic, so the reader is cautioned on the generalizability of the findings. Although measures of perceived confidence are thought of as key predictors of behavioral change based on many theories and models, there is no evidence that the lack of change in confidence observed in responders will result in a lack of confidence to care for patients from diverse populations in the future. A follow-up study to monitor this student cohort's confidence level 1 year after graduation would address this question. Another limitation was the timing of the pre-confidence measures performed following 4 hours of cultural diversity instruction. The baseline measure of the students' confidence was not made at the onset of the course. Confounders exist such that cultural competency training (intended or unintended) may have occurred elsewhere. Also, the small sample size was a further limitation to generalizability. The student participants' sociodemographic characteristics and their prior training and experience with diverse cultures were not measured. Genao, et al[13] reported that 45% of third-year medical students/subjects experienced prior training in cultural competency before attending a cultural competency course. The same may be true for the student population in the current study. The relationship between a student's sociodemographic characteristics and prior life experience and self-reported cultural competency remains unexplored. Lastly, there was a lack of validation of the questionnaires used in this study, which limited the claims made of their intended measure.

Despite these limitations, this study provided *de novo* information in an area where minimal or no information exists within the chiropractic profession. With continuing diversity in the United States and the globalization of chiropractic, chiropractors are increasingly challenged to effectively care for patients from diverse backgrounds. Cultural competency training in the chiropractic college curriculum can prepare future chiropractors to appropriately and effectively care and serve diverse patient populations throughout their careers. As part of the quality assurance in education, it is vital to demonstrate that students have achieved their intended educational outcomes (i.e., cultural competence) in addition to curricular refinement/improvement and directing future teaching efforts. The results of this study provided the beginnings toward the above-described efforts.

CONCLUSION

This analysis found that a 6-hour cultural competency educational program improved chiropractic students' knowledge in cultural competency. However, the findings do not support the notion that with the training provided, students' confidence increased in their ability to care for diverse populations. Further research is needed to improve the educational outcomes in cultural competency and to direct course and curricular refinement and improvement.

CONFLICTS OF INTEREST

No funding was received for this project. Kim Khauv receives compensation from Life Chiropractic College West to teach courses and conduct research. Joel Alcantara receives funding from Life Chiropractic College West and the International Chiropractic Pediatric Association to conduct research and present seminars on the chiropractic care of children and pregnant women, and on family wellness care.

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