

Teaching Culturally Effective Diabetes Care: Results of a Randomized Controlled Trial

Randa M. Kutob, MD, MPH; Janet H. Senf, PhD; John M. Harris, Jr, MD, MBA

Background and Objectives: Increased cultural competence is a tool in the fight to eliminate health disparities in people with diabetes. However, questions remain regarding the best cultural competence teaching, evaluation, and dissemination methods. An Internet-based approach requires less facilitator time and provides greater ease of dissemination. We developed and tested a skills-focused, Internet-based course on cultural competence in the context of type 2 diabetes. **Methods:** To test the effectiveness of the course, a randomized controlled trial was conducted on a national sample of 122 family medicine residents. The primary outcome was measured by changes in score on the Cultural Competence Assessment Tool (CCAT), a new self-assessment tool developed for this study. **Results:** Total CCAT score increased significantly after the completion of the Internet course for 58 residents in the experimental group (83.55 before the course, 192.09 after the course) but did not change for the 64 residents in the control group (177.58 at baseline, 177.84 at end of study). On multivariate analysis, the only significant predictor of total CCAT score change was having taken the online course. **Conclusions:** A skills-based course on cultural competence, delivered via the Internet, is an effective educational strategy. It has potential for dissemination of standardized content.

(Fam Med 2009;41(3):167-74.)

In chronic diseases such as type 2 diabetes, health disparities are strikingly evident. African Americans, American Indians, and Latinos have greater rates of disease,¹ suffer higher rates of complications,^{2,3} and are more likely to die as a result of diabetes than are non-Hispanic, white Americans.⁴ While factors such as access to care, health insurance, and socioeconomic status contribute to these disparities, several studies have demonstrated that disparities persist even after controlling for these factors.^{5,6} Diabetes-related disparities are even more disturbing given the ever-expanding armamentarium of pharmacological therapies now available to help achieve glycemic control of type 2 diabetes.

In 2002, the Institute of Medicine (IOM) cited provider cross-cultural training as one intervention that held significant promise for reducing health disparities.⁷ Cultural competence is now also considered a core skill in undergraduate and graduate medical educa-

tion.^{8,9} Thus, the last decade has seen an increase in the number of cultural competence training programs and evaluation tools.^{10,11}

Questions remain, however, regarding the best strategies for teaching and evaluating cultural competence. Concerns have been raised, for example, about pedagogical approaches that stress knowledge of specific racially or ethnically defined groups because of the possibility of stereotyping those groups.¹²⁻¹⁴ In contrast, skills-based approaches focus on doctor-patient interactions rather than knowledge of specific groups. This has been described as a “melding” of medical interviewing skills with ethnographic techniques.⁷ Information on patients’ cultural views is obtained during the clinical encounter; prior cultural knowledge, therefore, is not a prerequisite. With a skills-based approach, culture can be considered in its broadest sense and is not limited to racial or ethnic frameworks.

The debate about teaching strategies is further complicated by lack of consistency in how cultural competence training is delivered. The majority of training programs described in the literature are one-time seminars involving a group activity facilitated by one or more instructors.¹⁰ New educational technologies, such as interactive computer-aided instruction, are less

From the Department of Family and Community Medicine, University of Arizona (Drs Kutob and Senf); and Department of Medicine, University of Arizona and Medical Directions, Inc, Tucson, Ariz (Dr Harris).

labor intensive and also ensure standardized content. These technologies can be as effective as face-to-face lectures^{15, 16} and can be used to teach complex skills.^{17, 18} Indeed, computer-aided instruction provides opportunities to take learners out of the classroom, immersing them in realistic, virtual environments. Yet, unlike actual clinical encounters, these technologies allow a nonjudgmental, standardized environment for repetition and practice of newly acquired skills.¹⁹ This is especially important for cultural competence training since a nonjudgmental environment may allow learners to engage in a deeper critical assessment of their learning needs without fear of censure by others or pressure to mimic a politically correct response.

The nursing education literature has examined computer-assisted, Web-based modes of delivery of cultural competence education, but only limited evaluation data have been reported.²⁰⁻²³ We could find no studies examining computer-assisted approaches to cultural competence training in undergraduate or graduate medical education programs.

We developed a case-based, interactive Internet program, *Delivering Culturally Effective Care*, to teach cultural competence skills to physicians. The course was designed to focus on one common medical condition—type-2 diabetes. Mexican-American

patients were the prototype patient population for the course, but specific knowledge of Mexican culture was neither the primary feature nor the primary goal. To assess the course, we developed a cultural competence self-assessment tool and use the tool to assess changes in cultural competence of a national sample of family medicine residents in a randomized controlled trial (RCT). The study's primary hypothesis was that physicians taking the program would have scores on the self-assessment tool indicating increased cultural competence compared to a control group of physicians not taking the course.

Methods

Course Development and Content

A group of experts in anthropology, endocrinology, family medicine, internal medicine, and nutrition developed the theoretical framework for the course. The Health Beliefs Model²⁴ and Kleinman's explanatory model of disease²⁵ were chosen as a theoretical grounding for the course because of their relevance to chronic disease management and the clinical encounter. Figure 1 depicts Kleinman's model.

Learning objectives were drawn from the Society of Teachers of Family Medicine's Core Curricular Guidelines.²⁶ The expert group also reviewed Berlin

Figure 1

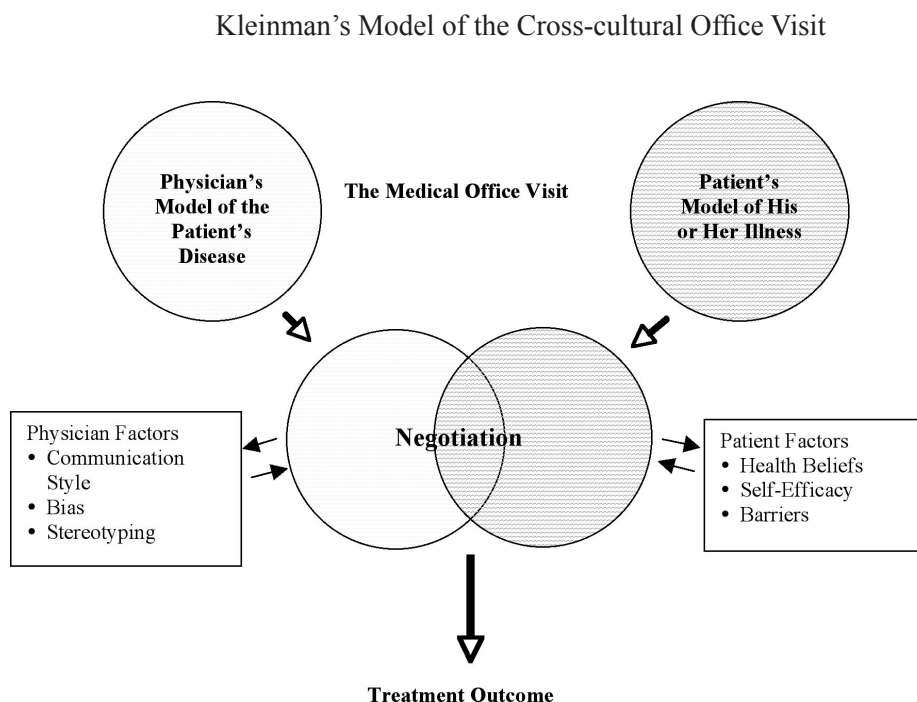


Figure 1 depicts the interaction of provider and patient explanatory models as described by Kleinman. It also lists provider-related and patient-related factors that additionally influence health outcomes.

and Fowkes' LEARN Model²⁷ and from this derived a skills-based, four-step approach to cultural competence, called the Ask, Share, Compare, Negotiate (ASCN, ie, "askin") Model. Table 1 displays learning objectives and content. The full course has been available since 2004 and is posted at www.vlh.com.

Cultural Competence Assessment Tool Development

The expert group developed a written self-assessment tool to be used in conjunction with the Internet course. The tool was based on the same theoretical models just mentioned.

The tool emphasized 11 focus areas: (1) cultural self-awareness, (2) ability to be open/ nonjudgmental, (3) knowledge about different racial/ethnic groups, (4)

avoidance of stereotyping, (5) understanding of non-verbal communication, (6) ability to elicit explanatory models (ie, asking patients about their views of illness causation or treatment), (7) medical knowledge transmission skills, (8) ability to explain benefits of therapy, (9) addressing fears, (10) addressing barriers, and (11) ability to empower.

A 4-point Likert-type scale was used to score items. The expert group selected several items from existing instruments, including the Multicultural Awareness/Knowledge/Skills Survey (MAKSS),²⁸ the Multicultural Counseling Inventory (MCI),²⁹ the Multicultural Counseling, Knowledge, and Awareness Scale (MCKAS),³⁰ the Cultural Self-efficacy Scale,³¹ and the Intercultural Development Inventory (IDI).³² Most

Table 1
Course Design Features, Learning Objectives, and Specific Content

General Design Features
Context: case-based, older Mexican American woman with inadequately controlled type 2 diabetes.
Cultural competence and type 2 diabetes content interwoven.
Interactive questions with immediate feedback embedded within case.
Open-ended responses with option to see responses of others.
Brief, text-based tutorials on topics presented in case.
Learning Objectives
Recognize the differences between the terms <i>race</i> , <i>ethnicity</i> , and <i>culture</i> .
Use the Ask, Share, Compare, Negotiate (ASCN) Model with patients in the office setting.
Describe research findings on health disparities, health beliefs, and health behaviors in Mexican American patients.
Clinically manage potential barriers to control of blood sugar for patients with type 2 diabetes.
Appropriately order routine preventive services for patients with diabetes.
Specific Content and Exercises
<i>General Concepts of Health Disparities, Culture, and Health</i>
Health disparities—definition and examples.
Cultural competence definition and relation to elimination of health disparities.
Definitions of race, ethnicity, and culture.
Exercise: guessing an unidentified person's race, ethnicity, and culture from their picture.
Exercise: fill in the blank for user's own race, ethnicity, and culture. View responses of others.
Definitions of health beliefs and health behaviors.
Exercise: identify user's own health beliefs and behaviors. View responses of others.
<i>The Skills-based Approach to Cultural Competence</i>
Introduction to the ASCN model of cross-cultural communication.
Exercise: practice using in the ASCN model, multiple opportunities throughout case.
<u>Ask</u> about the patient's views of diabetes and its treatment
<u>Share</u> the biomedical model
<u>Compare</u> provider's and patient's explanatory models
<u>Negotiate</u> a treatment plan
<i>Diabetes in Mexican American Populations</i>
Qualitative and quantitative studies of diabetes-related health beliefs and behaviors for Mexican Americans.
Information on barriers to diabetes care, ie, cost of supplies.
Type 2 diabetes prevalence and complications.
Diabetes preventive services.
Exercise: determine which service patient is due for after reviewing diabetes flow sheet in chart.

items, however, were developed *de novo*. The first draft of the instrument had a total of 96 items.

The instrument went through two rounds of pretesting using university-based family medicine faculty and residents; the purpose of pretesting was to improve item clarity and remove ambiguous items. Using a restricted Internet site, the modified instrument was again pre-tested on a volunteer national sample of 83 family medicine residents whose contact information was obtained (with permission) from the membership list of the American Academy of Family Physicians (AAFP). Cronbach's alpha was calculated on each of the potential domain subscales representing the 11 traits described above, and items that decreased the overall alpha coefficient were deleted. The final alpha coefficient for each of the potential subscales ranged from .70 to .97. Items in the avoidance-of-stereotyping subscale were dropped due to poor reliability, and items in the medical knowledge transmission, explaining benefits of therapy, addressing fears, addressing barriers, and ability to empower scales were combined into one subscale ("Empowerment") because of strong internal consistency between these items ($\alpha=.97$).

The resulting Cultural Competence Assessment Tool (CCAT) had 68 items representing six subscales. Reliability results and sample items are shown in Table 2. The complete CCAT may be viewed at www.vlh.com.

Study Population and Experimental Design

Participants were recruited from a random sample of resident members of the AAFP. The University of Arizona's Institutional Review Board approved the study design.

Potential participants were sent a letter in January 2004 inviting them to participate in the study; only first-, second-, or third-year family medicine residents were eligible to participate. Once logged on to the study's restricted Web site, participants were asked to take the CCAT as a pretest and to provide demographic information. Participants were then alternately assigned to treatment or control groups.

After no less than 1 week and no more than 4 weeks, subjects in the experimental group were invited to take the module and complete the cultural competence assessment tool again (posttest). The module took less

Table 2

Cultural Competence Assessment Tool Domains, Reliability, and Sample Items

<i>Domains</i>	<i># of Items Per Domain</i>	<i>Alpha</i>	<i>Sample Item</i>
Cultural Self-Awareness	10	.89	I am able to describe my own beliefs about health and illness to a person from a different background than mine.
Nonjudgmental Thinking	6	.70	Patients' lack of motivation to obtain knowledge is the main reason for their nonadherence to medical therapy.
Cultural Knowledge	18	.91	<i>Please indicate your understanding of each of the following items for each ethnic or racial group indicated.</i> Beliefs about health and illness a. Black b. White, non-Hispanic c. Hispanic
Nonverbal Communication	9	.88	<i>Please indicate your understanding of each of the following items for each ethnic or racial group indicated.</i> Role of physical touch a. Black b. White, non-Hispanic c. Hispanic
Empowerment	15	.97	<i>Please indicate your level of comfort in performing each of the following tasks for each group listed.</i> Empowering patients to take an active role in their diabetes care and their glycemic control. a. Black b. White, non-Hispanic c. Hispanic
Explanatory Model Elicitation	10	.83	<i>Please indicate how often you perform each of the following items in your practice today and how often you will in the future.</i> Ask patients about their views of the cause of their diabetes a. In your practice today b. In the future

than 1 hour to complete. Subjects in the control group completed only the posttest during the same time period. Participants were paid \$25 upon completion of each CCAT. A total of 122 physicians completed both CCATs and were included in the analysis, with 64 physicians serving as controls and 58 physicians completing the online module.

Statistical Analysis

The study's primary hypothesis was that physicians taking the program would report increased cultural competence compared to a control group of physicians not taking the course. Change in total CCAT score was the primary study endpoint. Subscale scores were secondary endpoints and were obtained by summing the Likert-scale items (ranging from one to four) and dividing by the total number of items in that subscale. For every subscale except "Nonjudgmental Thinking," a higher number indicated a higher level of self-reported cultural competence. For the "Nonjudgmental Thinking" subscale, a lower score indicated better cultural competence. The total CCAT score was calculated by summing all the individual item scores. Items in the "Nonjudgmental Thinking" subscale were reverse coded before inclusion in total CCAT calculation.

Chi-square and independent sample *t* tests were used to compare categorical and continuous data for the intervention and control groups at baseline. Paired *t* tests were used to compare changes in total CCAT and subscale scores for each group between baseline and posttesting. A regression equation was also developed with "total score change" (defined as posttest total CCAT score minus baseline total CCAT score) as the dependent measure, with the following independent variables: participants' race or ethnicity, year of residency, knowledge of diabetes guidelines, hours of previous cultural competence training, and whether or not the participant took the online module. All analyses were performed with SPSS, Version 15.

Results

Demographics and Other Characteristics

Table 3 compares demographic and other characteristics (ie, knowledge of diabetes guidelines, practice demographics, conversational Spanish ability, etc) of participants in the control and experimental groups. No significant differences were found between the two groups for any of these characteristics.

Comparison of CCAT Scores at Baseline

The baseline total CCAT scores for all 122 participants in the study ranged from 137 to 251, with a mean of 180.25 and a standard deviation of 22.67. Table 4 displays the total and subscale scores.

Although total CCAT score was not significantly different between the two groups at baseline ($P=.225$),

scores on one subscale score ("Cultural Knowledge") were different. The control group reported less "Cultural Knowledge" than those in the experimental group. This was explained by a difference in the items pertaining to Hispanic patients, with those in the control group reporting significantly less knowledge than those in the experimental group ($P=.016$).

Effect of Internet Course on CCAT Total and Subscale Scores

Table 4 also displays results of paired *t* tests for controls and intervention group participants. The control group's total CCAT score did not change between the two administrations. Scores on one subscale, however, did demonstrate differences. The control group had lower "Cultural Self-Awareness" scores on the posttest (3.38 at baseline versus 3.20 at posttest, $P<.001$). Also, for the control group, although the "Cultural Knowledge" subscale score was not different ($P=.120$), the "Hispanic" item scores did show significant change with an increase in score from baseline, 2.01, to posttest, 2.19, $P=.015$.

The total CCAT score increased significantly for the experimental group, with a mean of 183.55 at baseline and 192.09 after completing the online course ($P=.004$). Three subscale scores increased significantly: "Cultural Knowledge" ($P=.001$), "Non-verbal Communication" ($P=.013$), and "Explanatory Model Elicitation" ($P=.002$). Changes in the "Cultural Knowledge" subscale were reflected in each of the three groups of racial/ethnically defined items, "Black" ($P=.007$), "Hispanic" ($P=.001$), and "White" ($P=.002$). Item scores for the "Nonverbal Communication" subscale improved for "Hispanic" ($P=.014$) and "White" ($P=.025$) categories but not for "Black" ($P=.103$). The "Explanatory Model Elicitation" items related to "Future" elicitation ($P<.001$) increased significantly but not those relating to eliciting information "Today" ($P=.097$).

Predictors of CCAT Change Score

The regression module evaluating predictors of "total score change" showed that having taken the online module was the only significant predictor of that change (adjusted $R^2=.133$, $P=.025$).

Discussion

This study's findings demonstrated that a brief, Internet-based, interactive program could significantly change cultural competence as measured by a self-assessment tool. This finding is notable because this is the first study that examines computer-assisted technologies in the delivery of cultural competence content in a RCT design. Most published evaluations of cultural competence training programs involve longer interventions delivered face to face by one or more instructors on a yearly basis.¹⁰ Our results sug-

Table 3

Study Participants' Demographics/Characteristics, n=122

	Control Group n=64 % (n)	Experimental Group n=58 % (n)
Gender female	59% (38)	43% (25)
Mean age	32	30
Race/ethnicity		
White, non-Hispanic	59% (38)	57% (33)
Asian/Pacific Islander	20% (13)	28% (16)
Hispanic/Latino	5% (3)	5% (3)
Black	5% (3)	5% (3)
American Indian	2% (1)	0% (0)
Other	8% (5)	3% (2)
Residency year		
PGY-1	19% (12)	35% (20)
PGY-2	42% (27)	28% (16)
PGY-3	36% (23)	36% (21)
Knowledge of diabetes guidelines		
Excellent	13% (8)	17% (10)
Above average	58% (37)	50% (29)
Average	28% (19)	33% (19)
Below average	0% (0)	0% (0)
Poor	0% (0)	0% (0)
Conversational Spanish ability		
Excellent	9% (6)	10% (6)
Good	9% (6)	7% (4)
Fair	9% (6)	24% (14)
Poor	47% (30)	38% (22)
None	22% (14)	19% (11)
Prior cultural competence training		
<1 hour	14% (9)	14% (8)
1-3 hours	31% (20)	22% (13)
4-6 hours	27% (17)	35% (20)
7-10 hours	9% (6)	9% (5)
>10 hours	17% (11)	19% (11)
Patient panels race/ethnicity (mean %)		
White, non-Hispanic	41%	44%
Black	29%	31%
Hispanic/Latino	23%	17%
Asian/Pacific Islander	4%	4%
American Indian	2%	1%
Other	2%	2%

gest that computer-aided technologies with appropriate context, interactive elements, and standardized content may provide similar results without the ongoing time investment. They may also be ideal for sensitive topics like cultural competence training by providing a non-judgmental environment to practice skills.

Our course emphasized a skills-based pedagogical approach. Participants taking the course were more likely to report that they would elicit patients' explana-

tory models but did not report increased confidence in their ability to empower patients. These findings may be due to differences between the two types of skills. Eliciting patients' explanatory models involves data gathering, which may be a much easier skill to acquire than the ability to empower, which requires some facility with the more complex skill of negotiation. Improvement in negotiation skills may require a longer intervention with more opportunities to practice negotiating in a variety of case scenarios.

Noteworthy is the fact that even though cultural knowledge was not the primary focus of the course, participants' self-reported knowledge of "Black," "Hispanic," and "White" patients improved. While health disparities course content could explain these findings, it is also possible that improvement in "White" cultural knowledge could have been the result of the cultural awareness exercises embedded within the course. Since a majority of participants identified themselves as "White," completing these exercises may have led to increased knowledge of their own racial, ethnic, or cultural group. Yet another possibility is that the skills-based approach itself increased the participants' knowledge of their own cultural group. In the ASCN model, sharing the biomedical model, and comparing both views requires a reflection on the provider's explanatory models as well as the patient's.

The interweaving of cultural skills with standard medical skills in a familiar context (type-2 diabetes) was a key element of the course. The successful management of the case depended not only on diabetes knowledge but also on using a culturally effective approach. This pedagogical strategy was designed to make cultural competence integral to medical care and not an "exotic" experience. In a national study of residents' perceptions of cultural competence training, investigators noted that residents "did not want to be taught to be 'culturally sensitive.'" Rather, they desired an integration of culturally competent medicine in practice.³³

Limitations

Our study was limited to family medicine residents. In the survey cited above, family medicine respondents were less likely to report a lack of preparedness to deal with several aspects of cross-cultural patient care than residents from other specialties.³³ Although in our study, we adjusted for prior cultural competence training with a multivariate analysis, family medicine residents may have already been "primed" to be more open to the subject matter.

Table 4
Results of Paired *t* Tests for Control and Experimental Groups

Domains*	Control Group		P Value	Experimental Group		P Value
	Baseline	Post		Baseline	Post	
Cultural Self-awareness	3.38	3.20	<.001**	3.26	3.31	.420
Nonjudgmental Thinking	2.54	2.55	.898	2.41	2.35	.371
Cultural Knowledge	2.17†	2.26	.120	2.38†	2.62	.001**
Black	2.10	2.13	.549	2.30	2.50	.007**
White	2.41	2.46	.402	2.57	2.81	.002**
Hispanic	2.01‡	2.19	.015**	2.28‡	2.55	.001**
Nonverbal Communication	2.23	2.31	.168	2.33	2.52	.013**
Black	2.18	2.23	.586	2.27	2.42	.103
White	2.39	2.48	.221	2.49	2.69	.025**
Hispanic	2.11	2.23	.136	2.23	2.45	.014**
Empowerment	2.71	2.73	.726	2.93	3.04	.173
Black	2.68	2.68	.950	2.90	3.04	.135
White	2.84	2.87	.653	3.04	3.10	.447
Hispanic	2.60	2.64	.621	2.84	2.99	.113
Explanatory Model Elicitation	2.87	2.80	.179	2.85	3.02	.002**
Today	2.61	2.53	.198	2.67	2.57	.097
Future	3.14	3.07	.311	3.03	3.47	<.001**
Total score	177.58	177.84	.907	183.55	192.09	.004

* Domain scores range from 1 (lower score) to 4 (higher score). The “Nonjudgmental Thinking” domain score is reverse coded for display purposes to be consistent with other domain scores.

** Significant at $P < .05$

† “Cultural Knowledge” scores at baseline were significantly different between control and experimental groups ($P = .018$).

‡ “Hispanic, Cultural Knowledge” scores at baseline were different between control and experimental groups ($P = .016$).

A further limitation was the self-reported nature of the CCAT. Two recent reviews of other existing cultural competence assessment tools noted self-report to be a concern for most existing tools, either because of the potential for social desirability bias¹¹ or due to validity concerns.³⁴ Our study’s randomized-controlled design would tend to balance social desirability bias, if present, across control and experimental groups. Other limitations of the CCAT include its inability to assess stereotyping. Further studies are needed to validate existing measurement tools and to see if physicians’ self-report correlates with actual physician behaviors.

Conclusions

A relatively brief (1 hour) program that did not require live faculty intervention was able to improve family medicine residents’ self-reported cultural competence skills. The combination of a skills-based approach with the flexibility and portability of an Internet-based delivery system makes it a potentially useful tool in addressing the problem of health disparities.

Acknowledgments: This work was funded by the National Institutes of Health, National Institute of Diabetes and Digestive and Kidney Diseases (No. 5R42DK062569).

A portion of this work was presented at the 2008 North American Primary Care Research Group Annual Conference in Vancouver, British Columbia.

The authors thank David Johnson, MD; Tony Ramirez, MD; Lee Sechrest, PhD; Lisa Staten, PhD; and Douglas Taren, PhD, for their contributions to the course and assessment tool development. We would additionally like to thank Bob Amend, MEd, and Cheryl Novalis-Marine, MBA, MIS, for their technical expertise in programming the course.

Corresponding Author: Address correspondence to Dr Kutob, Department of Family and Community Medicine, PO Box 245052, Arizona Health Sciences Center, Tucson, AZ 85724. 520-626-3083. Fax: 520-626-6134. rkutob@email.arizona.edu.

REFERENCES

1. National Institute of Diabetes and Diseases and Kidney Diseases. National diabetes statistics fact sheet: general and national estimates on diabetes in the United States. Bethesda, Md: National Institutes of Health, 2005.
2. Harris M, Eastman R, Cowie C. Symptoms of sensory neuropathy in adults with NIDDM in the US population. *Diabetes Care* 1993;16(11):1446-52.
3. Harris MI, Klein R, Cowie CC, Rowland M, Byrd-Holt DD. Is the risk of diabetic retinopathy greater in non-Hispanic blacks and Mexican Americans than in non-Hispanic whites with type 2 diabetes? A US population study. *Diabetes Care* 1998;21(8):1230-5.

4. National Healthcare Disparities Report, 2003. Rockville, Md: Agency for Healthcare Research and Quality, 2003.
5. Cowie CC, Harris MI. Ambulatory medical care for non-Hispanic whites, African Americans, and Mexican-Americans with NIDDM in the US. *Diabetes Care* 1997;20(2):142-7.
6. Harris MI. Racial and ethnic differences in health care access and health outcomes for adults with type 2 diabetes. *Diabetes Care* 2001;24(3):454-9.
7. Smedley BD, Stith AY, Nelson AR, eds. *Unequal treatment: confronting racial and ethnic disparities in health care*. Washington, DC: National Academies Press, 2003.
8. Association of American Medical Colleges. *Cultural competence education for medical students*. Washington, DC: Association of American Medical Colleges, 2005.
9. ACGME Outcome Project. www.acgme.org/outcome/comp/compFull.asp. Accessed February 15, 2008.
10. Beach MC, Price EG, Gary TL, et al. Cultural competence: a systematic review of health care provider educational interventions. *Med Care* 2005;43(4):356-73.
11. Kumas-Tan Z, Beagan B, Loppie C, MacLeod A, Frank B. Measures of cultural competence: examining hidden assumptions. *Acad Med* 2007;82(6):548-57.
12. Betancourt JR. Cross-cultural medical education: conceptual approaches and frameworks for evaluation. *Acad Med* 2003;78(6):560-9.
13. Betancourt JR, Green AR, Carrillo JE, Ananeh-Firempong O. Defining cultural competence: a practical framework for addressing racial/ethnic disparities in health and health care. *Public Health Rep* 2003;118(4):293-302.
14. Kripalani S, Bussey-Jones J, Katz MG, Genao I. A prescription for cultural competence in medical education. *J Gen Intern Med* 2006;21(10):1116-20.
15. Fordis M, King JE, Ballantyne CM, et al. Comparison of the instructional efficacy of Internet-based CME with live interactive CME workshops: a randomized controlled trial. *JAMA* 2005;294(9):1043-51.
16. Davis J, Chryssafidou E, Zamora J, Davies D, Khan K, Coomarasamy A. Computer-based teaching is as good as face to face lecture-based teaching of evidence-based medicine: a randomized controlled trial. *BMC Med Educ* 2007;7:23.
17. Harris JM Jr, Kutob RM, Surprenant ZJ, Maiuro RD, Delate TA. Can Internet-based education improve physician confidence in dealing with domestic violence? *Fam Med* 2002;34(4):287-92.
18. Harris JM Jr, Elliot TE, Davis BE, Chabal C, Fulginiti JV, Fine PG. Educating generalist physicians about chronic pain: Live experts and online education can provide durable benefits. *Pain Med* 2008;Feb 5 [epub ahead of print].
19. Association of American Medical Colleges. *Effective use of educational technology in medical education. Colloquium on educational technology: recommendations and guidelines for medical educators*. Washington, DC: Association of American Medical Colleges, 2007.
20. Schitai A. Caring for Hispanic patients interactively: simulations and practices for allied health professionals. *J Nurs Staff Dev: JNSD* 2004;20(1):50-5.
21. Wendler MC, Struthers R. Bridging culture online: strategies for teaching cultural sensitivity. *J Prof Nurs* 2002;18(6):320-7.
22. Scisney-Matlock M. Systematic methods to enhance diversity knowledge gained: a proposed path to professional richness. *J Cult Divers* 2000;7(2):41-7.
23. Zahner SJ. Partnerships for learning population-based public health nursing: Web-delivered continuing education for public health nurse preceptors. *Public Health Nurs* 2006;23(6):547-54.
24. Rosenstock IM. The Health Belief Model: explaining health behavior through experiences. In: Glantz K, Lewis FM, Rimer BK, eds. *Health behavior and health education*. San Francisco: Jossey-Bass Publishers, 1990.
25. Kleinman A. *Patient and healers in the context of culture*. Berkeley, Calif: University of California Press, 1980.
26. Like RC, Steiner RP, Rubel AJ. STFM Core Curriculum Guidelines. Recommended core curriculum guidelines on culturally sensitive and competent health care. *Fam Med* 1996;28(4):291-7.
27. Berlin E, Fowkes W. A teaching framework for cross-cultural health care. *West J Med* 1982;139:934-8.
28. D'Andrea M, Daniels J, Heck R. Evaluating the impact of multicultural counseling training. *Journal of Counseling and Development* 1991;70:143-50.
29. Taffe RC, Gutkin TB, Wise SL. Development of the Multicultural Counseling Inventory: a self-report measure of multicultural competencies. *Journal of Counseling Psychology* 1994;42:137-48.
30. Ponterotto JG, Gretchen D, Utsey SO, Reiger BP, Austin RA. Construct Validity Study of the Multicultural Counseling Awareness Scale (MCAS). In: Ponterotto JG, Casas JM, Suzuki LA, Alexander CM, eds. *Handbook of multicultural counseling, second edition*. Thousand Oaks, Calif: Sage Publications, 2001.
31. Bernal H, Froman R. The confidence of community health nurses in caring for ethnically diverse populations. *Image J Nurs Sch* 1987;19:201-3.
32. Hammer MR. A measure of intercultural sensitivity: the Intercultural Development Inventory. In: Fowler S, Mumford MG, eds. *The intercultural sourcebook*. Yarmouth, Neb: Intercultural Press, 1998.
33. Park ER, Betancourt JR, Kim MK, Maina AW, Blumenthal D, Weissman JS. Mixed messages: residents' experiences learning cross-cultural care. *Acad Med* 2005;80(9):874-80.
34. Gozu A, Beach MC, Price EG, et al. Self-administered instruments to measure cultural competence of health professionals: a systematic review. *Teach Learn Med* 2007;19(2):180-90.