Student Perceptions About the Mission of Dental Schools to Advance Global Dentistry and Philanthropy

Chris S. Ivanoff, D.D.S.; Athena E. Ivanoff, B.S., B.S.; Krassimira Yaneva, D.D.S., Ph.D.; Timothy L. Hottel, D.D.S., M.S., M.B.A.; Hannah L. Proctor, B.B.A.

Abstract: In this study, 491 dental students at one dental school in the United States and one in Bulgaria were surveyed to assess their perceptions about the mission of dental schools to advance global dentistry and philanthropy. The study included questions about prior involvement in charitable dental missions. Many respondents felt that their dental school does not advance global dentistry nor adequately teaches students the virtues of philanthropy and volunteerism. The majority agreed, however, that dental schools have a moral obligation to raise the level of oral health care worldwide and help underserved communities access basic dental care. They reported that an opportunity to spend a semester at a foreign dental school would enhance their dental education in ways that are not presently fulfilled; help them better understand cultural diversity; and teach them about philanthropy and volunteerism. In their opinion, international exchange programs that provide clinical rotations and field experiences in economically challenged and underserved areas of the world would a) foster the global advancement of dentistry; b) promote an appreciation for cultural diversity and socioeconomic disparity in the communities that graduates will be serving; and c) teach students the virtues of philanthropy and volunteerism. This study may contribute to understanding factors affecting student involvement in programs to advance global dentistry.

Dr. Ivanoff is Associate Professor, Department of Bioscience Research and Director, Global Health Initiative, College of Dentistry, University of Tennessee Health Science Center; Ms. Ivanoff is Graduating Dual-Degree Candidate, Department of Chemistry and Department of Biology, Cleveland State University; Dr. Yaneva is Professor, Department of Dental Public Health, Faculty of Dental Medicine, Sofia Medical University, Sofia, Bulgaria; Dr. Hottel is Professor, Department of Prosthodontics, and Dean, College of Dentistry, University of Tennessee Health Science Center; and Ms. Proctor is Senior Administrative Services Assistant, College of Dentistry, University of Tennessee Health Science Center. Direct correspondence and requests for reprints to Dr. Chris S. Ivanoff, Department of Bioscience Research, College of Dentistry, University of Tennessee Health Science Center, 875 Union Avenue, Memphis, TN 38163; 901-448-1770 phone; 901-448-2744 fax; civanoff@uthsc.edu.

Keywords: dental students, global dentistry, philanthropy, international exchange, multiculturalism, volunteerism, dental education

Submitted for publication 11/2/12; accepted 1/24/13

The most visible mission of dental education is to develop future practitioners. Most dental schools include in their mission statements the basic goals to educate students to serve their patients and communities well; prepare students to continue to grow in skill and knowledge over their lifetime in practice; include research as an integral component of the school's mission; and reaffirm that patient care is related but not subservient to the missions of education and research.[1] In its report on the future of dentistry, the American Dental Association (ADA) recommended that the mission of dental schools be expanded to include programs in which students, residents, and faculty provide care for underserved populations in community clinics and practices, as well as training in cultural competence to develop necessary knowledge and skills to deal with diverse populations.[2] Hence, the Commission on Dental Accreditation (CODA) requires dental curricula to ensure that graduates are competent in managing a diverse patient population and have the interpersonal and communication skills to function successfully in a multicultural work environment.[3] Although the need for incorporating cultural competence into dental curricula is well documented,[2-7] there is little information in the dental literature specific to global dentistry and its potential to prepare culturally competent dentists. This study is intended to add to dental educators' knowledge regarding global dentistry as an aid to improve students' cultural knowledge and self-awareness.

Most U.S. dental schools (82 percent) integrate cultural competence into their curricula as a component of existing courses rather than as stand-

alone courses.[8] However, methods to train culturally competent dental students are not standardized. A majority of programs teach cultural competence only during the first year, while only a third of the programs integrate cultural competence content into all four years.[9] The lecture/seminar format is used most frequently, and few schools require faculty to complete cultural competence training.[8,10] These educational reforms are part and parcel with efforts to rectify widespread racial and ethnic disparities in the health care workforce[4,11,12] and to improve access to quality medical[5] and dental[13] health care by disparate groups. There is evidence that a diverse and culturally competent health care workforce is associated with improved patient-provider communication, greater choice and satisfaction for patients, and improved access to care among patients of racial and ethnic minority groups.[4] Curriculum content may also contribute to increased cultural knowledge and self-awareness among students.[10] As a result, recommendations have been made to increase oral health care providers' awareness of disparities, integrate cross-cultural education into their training, and graduate dentists who are more culturally sensitive, socially aware, and community-oriented.[6,13]

In this study, we conducted a survey of 491 U.S. and Bulgarian dental students in order to gain understanding of students' perceptions about global dentistry and philanthropy as it relates to the mission of contemporary dental education. The purpose of the survey was to gain insight into whether dental schools should integrate global dentistry into their curricula. The results were used to gauge students' interest in developing externships with foreign dental schools to treat underserved areas of the globe. Among the anticipated benefits of the survey, we sought to increase our understanding of students' perceptions about the timeliness and general aim of dental education and to determine whether contemporary dental education is satisfying students' interest in charitable dentistry; whether they think dental education has a moral and professional obligation to advance global dentistry; whether cross-national clinical exchanges will satisfy students' interest in global dentistry; and whether global dentistry can serve as an additional dimension of their cultural competence training.

Materials and Methods

This study was approved by the Central Commission of Research Ethics (Bulgarian Ministry of Education and Science) and the Institutional Review Board of the University of Tennessee Health Science Center (#12-02040-XM). The study was eligible for exempt review under 45CFR46.101(b)(2) because the study/project involves eligible research using educational tests, surveys, interview procedures, or observation of public behavior.

A simple five-to-ten-minute survey involving twenty-two questions (mostly Yes/No) related to philanthropy and global dentistry was conducted among students (n=307/384) at the University of Tennessee Health Science Center College of Dentistry (UT) (Table 1). The survey was conducted exclusively with D1, D2, D3, and D4 predoctoral dental students. A parallel survey (n=184/533) was conducted at Sofia Medical University Faculty of Dental Medicine (SMU) with exactly the same questions translated into Bulgarian (contact the corresponding author for the survey in Bulgarian). Participation in the survey was voluntary, and failure to participate did not adversely affect the students in any way. The SurveyMonkey format provided for complete anonymity of individual participants and confidentiality of the data.

A standard Pearson chi-square test was used to compare categorical variables ($p \leq 0.05$).[14] The chi-square test assesses whether paired observations on two variables are independent of each other (e.g., polling responses from people of different nationalities to see if one's nationality affects the response).[15] The survey was adapted for online administration as separate pretest and posttest databases. The data were downloaded to a Microsoft Office Excel spreadsheet and analyzed with JMP statistical software.

A cross-national focus group,[16,17] comprised of six Bulgarian and U.S. officials, educators, and students, was used for questionnaire development. The group, led by a moderator, was brought together (by Skype) to discuss survey topics. Two translators produced a draft translation, two reviewers reviewed translations with the translators, and one adjudicator decided whether the translation was ready to move to pretesting and then ready for fielding.[16,17] A pilot study was conducted to pretest procedures and materials involved in data collection, as well as to estimate response rates. Retrospective think-aloud pretesting was used to harmonize the Bulgarian language version to ensure measurement equivalence and identify questionnaire problems regarding question content, "skip patterns," or formatting.[17] Respondent debriefings (respondents' comments on specific questions or the survey as a whole)[17] ensured that the survey adequately conveyed the intended research questions

Table 1. Survey questions (English version)

1. Do you think that the multicultural environment at dental school helps students develop understanding, tolerance, and respect for other peoples?
2. Do you feel that your dental education adequately prepares you to understand and respect culturally diverse peoples and/or their challenges to obtaining good oral health care?
3. Do you think it is important for dental education to teach you about cultural diversity?
4. Do you feel that volunteerism and philanthropy are important qualities of a well-rounded and compassionate dentist?
5. Does your dental education specifically teach you about the importance of volunteerism and philanthropy?
6. Can you identify a program or course in your dental education curriculum that teaches you about volunteerism and philanthropy? If YES, please indicate what program: _____
7. Most dental schools include in their mission statements the basic goals to 1) educate students to serve their patients and communities well; 2) prepare students to continue to grow in skill and knowledge over their lifetime in practice; 3) include research as an integral component of the school's mission; and 4) reaffirm that patient care is related but not subservient to the missions of education and research. Do you feel that the dental school's mission reverberates with the additional commitment to advance global dentistry?
8. Do you feel that the dental school adequately expresses a mission to teach students the virtues of philanthropy and volunteerism?
9. Do you feel that UTHSC College of Dentistry adequately expresses a commitment to advance global dentistry?
10. Do you feel it is a moral duty of U.S. dental schools to actively work to raise the level of oral health care in global communities faced with special economic and logistical barriers to seeking and obtaining basic dental treatment?
11. Do you think it is important for dental schools to provide dental students with opportunities to participate in international exchange missions?
12. Do you feel the dental school encourages you to seek out or provides you with opportunities to be a volunteer to help underserved communities that cannot afford dental treatment and/or do not have access to dental care?
13. If you had a chance to participate during the school year in an international exchange program aiming to raise the standard of global dentistry and provide indigent communities worldwide with basic oral health care, would you participate?

In your opinion, would an international exchange opportunity that provides clinical rotations and field experiences in economically challenged and underserved areas of the world:

14. foster the global advancement of dentistry?
15. promote an appreciation for cultural and socioeconomic diversity of the communities graduates will be serving?
16. teach students the virtues of philanthropy and volunteerism?
17. Do you think that international exchange opportunities with other schools would enhance your dental education in ways not presently fulfilled?
18. Do you think an international exchange opportunity to spend a semester at a foreign dental school would help you better understand culturally diverse peoples?
19. Would an international exchange opportunity with a dental school abroad teach you about philanthropy and volunteerism?
20. Are you presently involved in any domestic dental mission whose aim is charitable?
21. Are you presently involved in any international dental mission whose aim is charitable?
22. Do you think that an international exchange opportunity for one semester might encourage you to consider charitable dental missions in the future?
23. Are you a freshman, sophomore, junior, or senior?

and measured the intended attitudes, values, and reported facts and that the collections of data were conducted according to specified study protocols in both countries and languages.

The questions intended to probe student attitudes about global dentistry and philanthropy as it relates to their dental education. The questions were designed around the mission statements of each dental school, ADA recommendations, and CODA requirements. The survey was limited to twenty-two Yes/No questions (five closed-ended questions per minute) to ensure attention span.[18] One self-report question was added to elicit data relating to students' prior involvement in charitable dentistry. One question assessed students' awareness of the intent of their dental education to make them culturally competent. Other questions were designed to assess students' perceptions about the fulfillment of those goals. Based on the face-to-face pretest in one of the four classes, the expected response rate was 30 percent.

Overall, 873 students were invited to participate in the final survey.

Results

Of the total number of first-, second-, third-, and fourth-year students in the United States (US) and Bulgaria (BG) solicited to participate in the survey, 90 percent US and 34.5 percent BG students responded (Figure 1). The margin of error for the entire sample (n=491) was ±4 percent, 95 percent CI. The margin of error for sample US (n=307) was ±5 percent, 95 percent CI. The margin of error for sample BG (n=184) was ±7 percent, 95 percent CI. Chi-square test p-values for most of the items were well below 0.05, indicating the differences in the percentage of Yes and No answers for Bulgaria and US probably represent real substantive differences in opinion between the groups. There was no statistical difference in opinion between US and BG students for questions 7, 10, 14, and 15 ($p>0.05$).

Based on the total number of respondents, the majority of the US students (84.2 percent) believed that a multicultural school environment helps dental students develop understanding and respect for other peoples (Table 2). In contrast, only 46.7 percent of the BG students shared that perception (Table 3). (See Table 4 for combined responses.) The majority of the US students agreed that it is important for dental education to teach them about cultural diversity (74.8 percent) and that their dental education did adequately prepare them to understand diverse population groups and/or their challenges to obtaining good oral health care (81.8 percent). On the other hand, only half of their BG counterparts (47.8 percent) agreed that cultural competence was important in dental education, although two-thirds (68.5 percent) also said they felt adequately prepared to confront the challenges of disparate groups in accessing oral health care.

Dental educators would generally agree that volunteerism and philanthropy are important qualities of a well-rounded and compassionate dentist, and

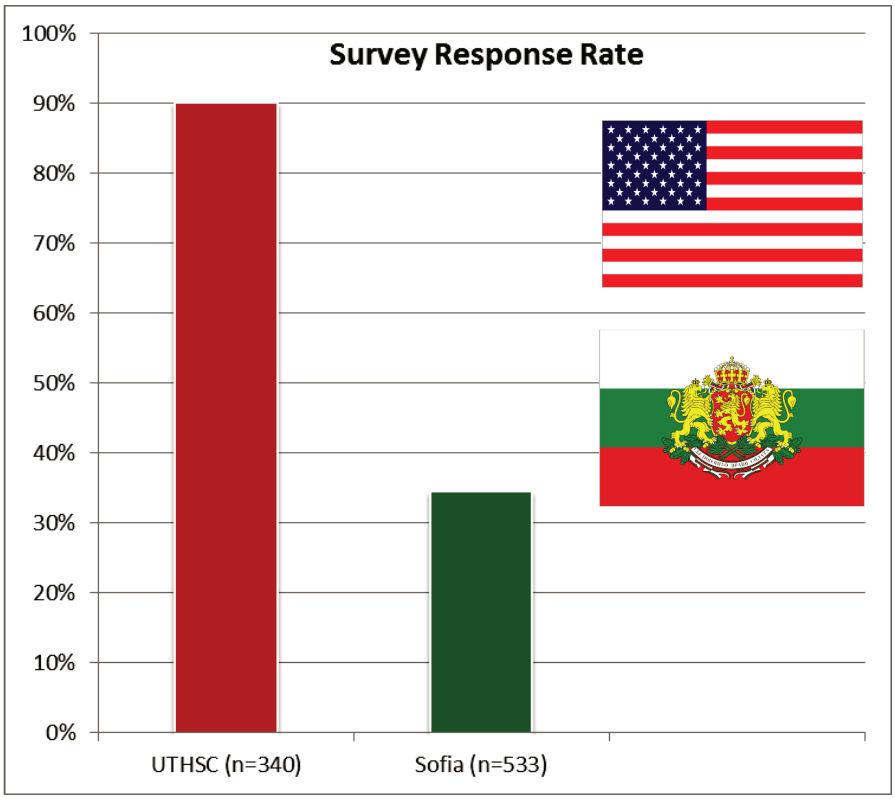

Figure 1. Response rate to surveys of dental students at University of Tennessee Health Science Center (UTHSC) and Sofia Medical University

this perception was widely shared by the students surveyed, both in Tennessee (95.8 percent) and Bulgaria (81.5 percent). However, as many as half the US respondents (49.2 percent) and 81.5 percent of the BG respondents reported that their dental education did not specifically aim to inculcate the attributes of volunteerism and philanthropy. When asked to identify a program or course in their dental curriculum that specifically teaches them about volunteerism and philanthropy, 59.1 percent of the US students and 90.2 percent in Bulgaria were unable to. Only 15.9 percent of the US seniors (11/69; Table 5) identified a local community-based dental mission they were required to participate in, while BG dental students reported none. Only one US student reported volunteering in a humanitarian mission abroad.

When asked whether their dental school's mission statements reflect a commitment to advance global dentistry, the majority of both US (84.5 percent) and BG students (88 percent) answered Yes, although neither school's mission statement explicitly includes it as a goal. Nevertheless, almost half (45 percent) of the US students and 71.7 percent in Bulgaria reported that their dental school does not do enough to encourage philanthropy and volunteerism nor visibly fulfills what the students perceived to be a commitment to promoting global dentistry (US 36 percent; BG 70.6 percent). The majority of students (US 84 percent; BG 77 percent) did agree, however, that dental schools have a moral duty to actively work to raise the level of oral health care in underserved global communities.

Approximately 85 percent of the US students indicated that it is important for dental schools to further provide students with opportunities to participate in international exchange missions. The Bulgarian students unanimously agreed with this opinion. A majority of the students in the United States (78.1 percent) and Bulgaria (92.4 percent) indicated that if they had a chance to participate in an international exchange program during the school year, they would participate. In their opinion, clinical rotations and field experiences in underserved areas of the world would foster the global advancement of dentistry (US 89.8 percent; BG 84.8 percent); promote an appreciation for cultural and socioeconomic diversity of the communities graduates will be serving (US 93.4 percent; BG 93.5 percent); and teach students the

Table 2. Responses of dental students at University of Tennessee Health Science Center, by year and total for all years

	D1 (n=82)		D2 (n=82)		D3 (n=74)		D4 (n=69)		Total (n=307)	
Question	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
1	86.4%	13.6%	90.1%	9.8%	79.2%	20.8%	80.9%	19.1%	84.2%	15.8%
2	93.7%	6.3%	76.8%	23.2%	85.1%	14.9%	70.6%	29.4%	81.8%	18.2%
3	85.4%	14.6%	80.2%	19.8%	71.6%	28.4%	58.8%	41.2%	74.8%	25.2%
4	97.6%	2.4%	97.6%	2.4%	94.6%	5.4%	92.6%	7.4%	95.8%	4.2%
5	66.3%	33.8%	32.1%	67.9%	41.9%	58.1%	64.7%	35.3%	50.8%	49.2%
6	37.5%	62.5%	24.1%	75.9%	36.5%	63.5%	69.1%	30.9%	40.9%	59.1%
7	95.1%	4.9%	76.5%	23.5%	89.2%	10.8%	76.5%	23.5%	84.5%	15.5%
8	73.8%	26.3%	34.6%	65.4%	46.6%	53.4%	64.7%	35.3%	54.6%	45.4%
9	79.0%	21.0%	59.3%	40.7%	62.2%	37.8%	54.4%	45.6%	64.1%	35.9%
10	90.2%	9.8%	84.0%	16.0%	91.9%	8.1%	67.6%	32.4%	83.9%	16.1%
11	86.6%	13.4%	92.7%	7.3%	89.2%	10.8%	67.6%	32.4%	84.6%	15.4%
12	79.7%	20.3%	69.5%	30.5%	72.6%	27.4%	77.9%	22.1%	74.8%	25.2%
13	79.3%	20.7%	82.7%	17.3%	86.5%	13.5%	62.3%	37.7%	78.1%	21.9%
14	95.1%	4.9%	95.1%	4.9%	90.5%	9.5%	76.5%	23.5%	89.8%	10.2%
15	96.3%	3.7%	98.8%	1.2%	95.9%	4.1%	80.9%	19.1%	93.4%	6.6%
16	96.3%	3.7%	97.5%	2.5%	95.9%	4.1%	79.4%	20.6%	92.8%	7.2%
17	77.5%	22.5%	88.8%	11.3%	82.2%	17.8%	61.8%	38.2%	78.1%	21.9%
18	84.0%	16.0%	90.1%	9.9%	81.1%	18.9%	75.0%	25.0%	82.9%	17.1%
19	75.3%	24.7%	81.5%	18.5%	81.9%	18.1%	62.3%	37.7%	75.6%	24.4%
20	23.5%	76.5%	24.7%	75.3%	28.4%	71.6%	33.3%	66.7%	27.2%	72.8%
21	9.9%	90.1%	15.0%	85.0%	29.7%	70.3%	18.8%	81.2%	18.1%	81.9%
22	75.3%	24.7%	82.7%	17.3%	81.1%	18.9%	68.1%	31.9%	77.0%	23.0%

Note: See Table 1 for questions. Percentages may not total 100% because of rounding.

virtues of philanthropy and volunteerism (US 92.8 percent; BG 73.9 percent). The majority reported that international exchange opportunities with other schools would enhance their dental education in ways that are not presently fulfilled (US 78.1 percent; BG 93.5 percent).

The student consensus was that an opportunity to spend a semester at a foreign dental school would help them better understand culturally diverse peoples and teach them about philanthropy and volunteerism (US 82.9 percent; BG 93.48 percent). When asked if they were presently involved in any domestic dental mission whose aim was charitable, 27.2 percent of the US students and 12 percent of the BG students reported yes. Although 18.1 percent of the US and 6.5 percent of the BG students also indicated they were presently involved in an international dental mission whose aim is charitable, only one US student specifically identified such a program. About 77 percent of the US students and 65 percent of their BG peers indicated that an international exchange opportunity for one semester may encourage them to consider charitable dental missions in the future.

Discussion

When we compared the response rates of the two student groups, it was interesting to note that, although the total UT class size (340) represented a smaller pool of students than SMU (533), 90 percent of the US students (307) responded in comparison to 34.5 percent of the BG students (184). It is difficult to predict the level of survey participation as response rates can be influenced by many factors. Internal surveys will generally receive a 30-40 percent response rate.[18] If respondents believe that participating in a survey will result in real improvements, response rates may increase.[19] This may have been the case with the US group. Since the survey format did not allow for comments to probe responses, no additional information could be gained that may have been insightful.

Although response rates can soar past 85 percent when the respondent population is motivated,[19] this does not mean that the BG group was less motivated or that the results are less reliable. Recent studies have shown that surveys with lower response

Table 3. Responses of dental students at Sofia Medical University, by year and total for all years

	D1 (n=70)		D2 (n=56)		D3 (n=28)		D4 (n=30)		Total (n=184)	
Question	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
1	62.9%	37.1%	39.3%	60.7%	35.7%	64.3%	33.3%	66.7%	46.7%	53.3%
2	77.1%	22.9%	60.7%	39.3%	35.7%	64.3%	93.3%	6.7%	68.5%	31.5%
3	62.9%	37.1%	42.9%	57.1%	35.7%	64.3%	33.3%	66.7%	47.8%	52.2%
4	80.0%	20.0%	89.3%	10.7%	85.7%	14.3%	66.7%	33.3%	81.5%	18.5%
5	14.3%	85.7%	32.1%	67.9%	21.4%	78.6%	0	100%	18.5%	81.5%
6	14.3%	85.7%	10.7%	89.3%	7.1%	92.9%	0	100%	9.8%	90.2%
7	91.4%	8.6%	96.4%	3.6%	92.9%	7.1%	60.0%	40.0%	88.0%	12.0%
8	20.0%	80.0%	50.0%	50.0%	35.7%	64.3%	0	100%	28.3%	71.7%
9	42.9%	57.1%	39.3%	60.7%	7.1%	92.9%	0	100%	29.4%	70.7%
10	91.4%	8.6%	82.1%	17.9%	85.7%	14.3%	26.7%	73.3%	77.2%	22.8%
11	100%	0	100%	0	100%	0	100%	0	100%	0
12	34.3%	65.7%	39.3%	60.7%	14.3%	85.7%	26.7%	73.3%	31.5%	68.5%
13	97.1%	2.9%	96.4%	3.6%	100%	0	66.7%	33.3%	92.4%	7.6%
14	91.4%	8.6%	78.6%	21.4%	71.4%	28.6%	26.7%	73.3%	84.8%	15.2%
15	94.3%	5.7%	100%	0	78.6%	21.4%	93.3%	6.7%	93.5%	6.5%
16	88.6%	11.4%	78.6%	21.4%	78.6%	21.4%	26.7%	73.3%	73.9%	26.1%
17	91.4%	8.6%	96.4%	3.6%	92.9%	7.1%	93.3%	6.7%	93.5%	6.5%
18	97.1%	2.9%	96.4%	3.6%	78.6%	21.4%	93.3%	6.7%	93.5%	6.5%
19	71.4%	28.6%	64.3%	35.7%	50.0%	50.0%	0	100%	54.4%	45.7%
20	0	100%	17.9%	82.1%	42.9%	57.1%	0	100%	12.0%	88.0%
21	0	100%	17.9%	82.1%	7.1%	92.9%	0	100%	6.5%	93.5%
22	94.3%	5.7%	71.4%	28.6%	42.9%	57.1%	6.7%	93.3%	65.2%	34.8%

Note: For these students, in a six-year predoctoral dental program, D1=third year, D2=fourth year, D3=fifth year, and D4=sixth year. See Table 1 for questions. Percentages may not total 100% because of rounding.

Table 4. Responses from students at the two dental schools combined, by year and total for all years

	D1 (n=152)		D2 (n=138)		D3 (n=102)		D4 (n=99)		Total (n=491)	
Question	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
1	74.6%	25.4%	64.7%	35.3%	57.5%	42.5%	57.1%	42.9%	65.4%	34.6%
2	85.4%	14.6%	68.8%	31.2%	60.4%	39.6%	82.0%	18.0%	75.2%	24.8%
3	74.1%	25.9%	61.5%	38.5%	53.7%	46.3%	46.1%	53.9%	61.3%	38.7%
4	88.8%	11.2%	93.4%	6.6%	90.2%	9.8%	79.6%	20.4%	88.6%	11.4%
5	40.3%	59.8%	32.1%	67.9%	31.7%	68.3%	32.4%	67.7%	34.7%	65.3%
6	25.9%	74.1%	17.4%	82.6%	21.8%	78.2%	34.6%	65.5%	25.3%	74.7%
7	93.3%	6.7%	86.5%	13.5%	91.0%	9.0%	68.3%	31.8%	86.3%	13.7%
8	46.9%	53.2%	42.3%	57.7%	41.2%	58.8%	32.4%	67.7%	41.4%	58.6%
9	60.9%	39.1%	49.3%	50.7%	34.7%	65.3%	27.2%	72.8%	46.7%	53.3%
10	90.8%	9.2%	83.1%	16.9%	88.8%	11.2%	47.1%	52.9%	80.6%	19.4%
11	93.3%	6.7%	96.4%	3.7%	94.6%	5.4%	83.8%	16.2%	92.3%	7.7%
12	57.0%	43.0%	54.4%	45.6%	43.4%	56.6%	52.3%	47.7%	53.2%	46.8%
13	88.2%	11.8%	89.6%	10.4%	93.3%	6.8%	64.5%	35.5%	85.2%	14.8%
14	93.3%	6.7%	86.8%	13.2%	81.0%	19.0%	51.6%	48.4%	87.3%	12.7%
15	95.3%	4.7%	99.4%	0.6%	87.2%	12.8%	87.1%	12.9%	93.5%	6.5%
16	92.4%	7.6%	88.0%	12.0%	87.2%	12.8%	53.0%	47.0%	83.3%	16.7%
17	84.5%	15.5%	92.6%	7.4%	87.5%	12.5%	77.6%	22.4%	85.8%	14.2%
18	90.6%	9.4%	93.3%	6.7%	79.8%	20.2%	84.2%	15.8%	88.2%	11.8%
19	73.4%	26.6%	72.9%	27.1%	66.0%	34.1%	31.2%	68.9%	65.0%	35.0%
20	11.8%	88.3%	21.3%	78.7%	35.6%	64.4%	16.7%	83.4%	19.6%	80.4%
21	5.0%	95.1%	16.4%	83.6%	18.4%	81.6%	9.4%	90.6%	12.3%	87.7%
22	84.8%	15.2%	77.1%	22.9%	62.0%	38.0%	37.4%	62.6%	71.1%	28.9%

Note: See Table 1 for questions. Percentages may not total 100% because of rounding.

rates (5-20 percent) may yield measurements as or more accurate than surveys with higher response rates (near 60-70 percent).[20-22] Questionnaires are simply not suited for some people, and this may have played a role in the lower response rate of the BG group, especially if surveys are not part of their culture.

Furthermore, only half the BG respondents (47 percent) agreed that multiculturalism in dental school promotes understanding and respect for other peoples, while a significantly higher number of US students (84 percent) agreed with this statement. This may be a reflection of the students' attitudes toward cultural competence training, which, in turn, may be influenced by multiple contextual factors, including student gender, marital status, and level of educational debt, but also by their dental school. Dental school environments that promote inclusion and respect of multiple cultures have been found to be significantly associated with students' perceptions of the adequacy of curriculum time for cultural competence and their preparedness to treat racially and culturally diverse groups.[23]

Of further interest, half the UT respondents (49.2 percent) and 81.5 percent at SMU indicated that their dental education did not specifically inculcate students with a respect for volunteerism and philanthropy. Several questions were specifically designed to evaluate students' perceptions about the existing curriculum by asking them to identify where and how cultural competence had been addressed previously in this regard. In the case of the UT students, 27.4 percent (n=84) identified some didactic content in courses such as Community Dentistry (10.7 percent, n=33) and Ethics (5.2 percent, n=16). Only 5.2 percent (n=16) of the US respondents indicated clinical experiences that provided students with opportunities to interact with diverse cultural groups as volunteers in two free community-based clinic programs, supported in part by school sponsorship (Table 5). Interestingly, only one of these students (>1 percent) reported participating in Give Kids a Smile, while 6.2 percent (n=19) reported participation in missions sponsored by church organizations or private enterprises and 5.5 percent (n=17) indicated they were exposed to racial and ethnic disparity issues from involvement in various student dental associations. Altogether, about 45.2 percent (139/307) of the total US students indicated being exposed to some form of

Table 5. Source of exposure to cultural diversity, philanthropy, and volunteerism reported by students at University of Tennessee Health Science Center

Program	D1	D2	D3	D4	Total Number	Total Percentage
Bellevue Baptist Dental Van	0	1	0	8	9	5.21%
Jackson Clinic	0	0	2	3	5	
Give Kids a Smile	0	1	0	0	1	
Health Fairs	0	0	1	0	1	
Missionary Trips	0	0	1	0	1	6.19%
Christian Group on Campus	1	0	0	0	1	
BCM (Baptist Collegiate Ministries)	1	3	3	0	7	
CMDA (Christian Medical Dental Association)	3	4	0	0	7	
Target House (Sponsored by Target Stores)	0	3	0	0	3	
SNDA (Student National Dental Association	3	3	0	1	7	5.54%
ASDA (American Student Dental Association)	2	0	2	1	5	
ASGA (American Student Government Association)	0	1	0	0	1	
AAWD (American Association of Women Dentists)	1	0	3	0	4	
Community Dentistry Course	0	0	0	33	33	27.36%
Ethics	12	3	0	1	16	
Special Patient Care	0	0	11	1	12	
Intro to Dentistry Course	3	0	4	0	7	
Diversity Course	6	0	0	0	6	
Healthcare Challenge Course	0	1	1	0	2	
Pathobiology Course	1	0	0	0	1	
Patient-Centered Dentistry Course	0	0	1	0	1	
Practice Management	0	0	0	1	1	
Public Dentistry Course	0	0	0	1	1	
DentSim	0	1	0	0	1	
Dental Hygiene	1	0	0	0	1	
Clinic	0	0	0	1	1	
Patient Evaluation	0	1	0	0	1	
No Specific Course	0	0	1	0	1	0.98%
Illegible	0	0	2	0	2	
Total Students	34	22	32	51	139	
Total Percentage	11.07%	7.17%	10.42%	16.61%	45.28%	

School-Sponsored Community Service Program
Church or Private Organization-Sponsored Missions
Student Dental Associations
Didactic Content in Courses
Miscellaneous

cultural competence content and/or volunteer opportunity that taught them about philanthropy: reported areas were in the dental curriculum (60.4 percent, 84/139), in church or privately sponsored community missions (13.7 percent, 19/130), in school-sponsored community service programs (11.5 percent, 16/139), or in student dental associations (12.2 percent, 12/139). On average, about 11 percent of each of the four classes, D1 to D4, reported being exposed to some cultural competence matters. Despite these numbers, more than half the students (54.8 percent) did not perceive any exposure to cultural competency content or material that was equivalent to specifically being taught the virtues of philanthropy.

Since UT has promoted several community outreach programs to involve juniors and seniors, 11.5 percent of these students could testify to local participation in school-sponsored humanitarian service. SMU students (90.2 percent), on the other hand, were unable to because no such local or international program existed. This is due in great part to the financial challenges faced by the school as well as the students, since people engaged in humanitarian missions, whether local or international, often do so on their own time and their own dime. Nevertheless, although mandatory participation in oral health clerkships may increase students' self-efficacy and cultural competence, evidence suggests that it may not lead to an increase in their intent to provide dental care in such settings afterwards.[24] The results of our survey imply, however, that cultural competence training in at least one U.S. dental school is progressing, but there is a desire for additional externships to achieve more demonstrably the basic objectives of cultural competence important to students.

Some studies have suggested that students tend to overestimate their cultural competence.[25] In contrast to our findings, most of the dental graduates and dentists in other studies reported believing that their education did not prepare them well to treat patients from cultural backgrounds different from their own.[23,26,27] Students' communication skills have also been found to be less effective when working with patients from different ethnic or cultural backgrounds,[28] especially when dental care and outcomes are influenced by culturally based beliefs and practices.[29] Students and dentists who do receive cultural competence education were more likely to report having intentions to treat patients from other cultures in one study.[27] Increased exposure to patients from multiple cultures during dental school also correlates with an increased willingness among dentists to treat patients from diverse ethnic and cultural groups and improved cross-cultural communication skills.[30,31]

This study found that cultural competency training was important to the surveyed US and BG dental students, but to varying degrees that may be dependent on cultural factors such as one's nationality. However, it was uniformly important to both student groups regardless of their nationality to also have opportunities in global dentistry that satisfy a personal need to perform philanthropy. There is some evidence that exposure to diverse patient populations during extramural rotations better prepares students to treat these populations beyond graduation.[32] The results of our study are consistent with a survey conducted among dental students in India.[33] In that survey, the overwhelming majority (87 percent) of responding students also expressed a desire to volunteer their dental skills in international missions, although the students felt they were not being taught about global oral health issues (99.2 percent); had not been trained to serve underserved populations (68 percent); and had not been trained in global health ethics (70.1 percent) or for cultural competence in addressing international oral health issues (100 percent). Those authors concluded that the study had identified a need for a global oral health course to be added to the dental curriculum.

Humanitarian educational trips to underserved communities can have a significant personal, professional, and social impact on dental students.[34] Factors that motivate dental students' participation include skill development, educational opportunity, and philanthropy. Cost and time commitments are strong inhibitors. Exposure to infectious diseases, substandard working and living conditions, threat of crime, and language barriers are mostly considered as not important.[34] These missions can increase cultural education, cross-cultural professional relationships, self-confidence, and public health awareness. They also offer dental students a valuable educational opportunity to make a significant contribution to improve oral health care in underserved rural communities around the globe.[35]

There are reports that service-learning programs involving multidisciplinary teams of dental, medical, nursing, public health, and social work students and faculty abroad may allow dental students to use their clinical skills in real-life situations, while providing them with structured time for reflection that may enhance teaching and foster civic responsibil-

ity in explicit partnership with the community.[36,37] Such programs can also increase students' cultural awareness, cross-cultural communication skills, and understanding of health care barriers faced by disparate groups.[36] The evidence suggests strongly that even though cross-cultural adaptability of students may be enhanced with appropriate training in the classroom, cross-cultural encounters are also needed to enable students to develop competence in providing cross-cultural health care.[38]

Extramural exchange programs might, therefore, further students' understanding of cultural attitudes towards oral health, communication, and the doctor-patient relationship that they can carry into practice back home.[30,31,34] While providing a learning experience that exposes students to social, environmental, and cultural influences that affect health and diseases, the experience of global community-based dental education might broaden dental students' social skills, stimulate their creativity and self-confidence, and provide the opportunity to experience clinical situations in real-life settings.[39] A team-oriented approach to outreach might also provide valuable professional exchanges in which dental faculty members and students have the opportunity to discuss emerging issues and learn from their global colleagues.

If international volunteerism is to be mutually advantageous, host countries, student volunteers, and project sponsors also need to understand how best they can work together and what can be achieved by volunteers for the greatest benefit of all concerned. Well-planned cross-national clerkships with sister dental schools overseas, based on partnerships with governmental and non-governmental organizations, could feasibly satisfy students' keenness for promoting volunteerism, while abating the potential harms of traditional volunteering focusing on short-term clinical treatment provision.[40,41]

The results of our study suggest that this U.S. dental school is fulfilling CODA requirements but could be doing more to fulfill students' expectations with regard to global dentistry. The students in both schools in the study reported that they were satisfied with current efforts to make them culturally competent but they were not being given curricular opportunities to do global dentistry. Philanthropy and volunteerism are not necessarily related to being culturally competent, but students did seem to believe that doing global dentistry can make them more culturally aware. Students also reported that engagement in global dentistry would satisfy their desire to do volunteer dentistry and fulfill them in ways that domestic involvement does not. Many of the surveyed students did not report that dental education cultivates philanthropy although the question was asked several times in different ways. As to student expectations, the students responded that they think dental schools show a commitment to engage them in global dentistry; yet neither of these goals is specifically stated in the missions of either school. Of further interest, although indirectly, is that the U.S. students did not seem to recognize that the Give Kids a Smile program can be as satisfying as performing charitable dentistry in underserved communities overseas. The question, therefore, is how dental schools can teach cultural competence and also cultivate philanthropy. Cultural competence does not necessarily sensitize students to economic disparities or cultivate a willingness to do dentistry for altruistic reasons. Poverty, on the other hand, can be domestic as well as global, and one does not have to look far to find it. Involving dental students with underserved populations domestically may be a further strategy to prepare volunteers for future international efforts while addressing inequities at home.[41]

Future studies should investigate whether an increase in philanthropy, volunteerism, and global oral health care consciousness leads to better care of indigent groups back home; identify additional cross-national opportunities to incorporate intercultural communication content; and develop externships in settings that serve diverse patient populations because there is evidence to suggest that dental students who complete such experiences are more likely to serve underserved communities in their clinical practices.[42,43] It would also be useful to survey students in additional dental schools since a limitation of our study is that it included only one dental school each from the United States and Europe, so these results may not be applicable to other schools.

Conclusion

The results of this study suggest that these dental students would value opportunities to engage in international exchanges, which may, in turn, increase their knowledge and self-awareness related to cultural competence. It also suggests that these students want their schools to provide them with a form of interactive learning in global dentistry that

satisfies their desire to volunteer for humanitarian purposes. The ultimate goal of developing curriculum content around cultural competence is to reduce racial and ethnic health disparities, both domestically and abroad. At the same time, cross-national clerkships may teach students the virtues of philanthropy and volunteerism, while students learn to serve each other, despite their diversity.

Acknowledgments

The authors extend thanks to the Honorable Rossen Plevenliev, President of the Republic of Bulgaria; Ms. Irina Bokova, Director General of UNESCO; Commissioner Kristalina Georgieva, Miroslav Minev, and Daniel Giorev, European Commission for International Cooperation, Humanitarian Aid, and Crisis Response; Ms. Ljudmila Vangelova and Dr. Radomir Ugrinov, Associate Dean and Director, Department of Integration and Financial Planning; Dr. Anton Filchev, Dean of Sofia Medical University Faculty of Dental Medicine; and Mr. Ronald C. Petrie, FNP-BC, Medical Attaché and His Excellency, Ambassador James B. Warlick Jr., American Embassy in Sofia, Bulgaria. We also thank Ms. Brenda Scott for assistance with pretesting at University of Tennessee Health Science Center College of Dentistry and student doctors Nadya Avramova and Petar Bozhinov for prefielding assistance at Sofia Medical University Faculty of Dental Medicine. This study was supported by the Dean's Funds of the College of Dentistry, University of Tennessee.

REFERENCES

1. Field MJ, ed. Dental education at the crossroads: challenges and change. An Institute of Medicine Report. Washington, DC: National Academies Press, 1995.
2. American Dental Association. Future of dentistry: education chapter. J Am Coll Dent 2002;19(1):18-22.
3. Commission on Dental Accreditation. Accreditation standards for dental education programs. Chicago: American Dental Association, 2007.
4. Smedley BD, Butler AS, Bristow LR. In the nation's compelling interest: ensuring diversity in the health care workforce. Washington, DC: National Academies Press, 2004.
5. Smedley BD, Stith AY, Nelson AR, eds. Unequal treatment: confronting racial and ethnic disparities in health care. Washington, DC: National Academy Press, 2002.
6. Davis EL, Stewart DCL, Guelmann M, Wee AG, Beach JL, Crews KM, Callan RS. Serving the public good: challenges of dental education in the twenty-first century. J Dent Educ 2007;71(8):1009-19.
7. Formicola AJ, Stavisky J, Lewy R. Cultural competence: dentistry and medicine learning from one another. J Dent Educ 2003;67(8):869-75.
8. Rowland ML, Bean CY, Casamassimo PS. A snapshot of cultural competency education in U.S. dental schools. J Dent Educ 2006;70(9):982-90.
9. Saleh L, Kuthy RA, Chalkley Y, Mescher KM. An assessment of cross-cultural education in U.S. dental schools. J Dent Educ 2006;70(6):610-23.
10. Pilcher ES, Charles LT, Lancaster CJ. Development and assessment of a cultural competency curriculum. J Dent Educ 2008;72(9):1020-8.
11. Agency for Healthcare Research and Quality. 2004 national health care disparities report. Rockville, MD: U.S. Department of Health and Human Services, 2004.
12. Agency for Healthcare Research and Quality. 2006 national health care disparities report. Rockville, MD: U.S. Department of Health and Human Services, 2006.
13. Oral health in America: a report of the surgeon general. Rockville, MD: U.S. Department of Health and Human Services, National Institute of Dental and Craniofacial Research, National Institutes of Health, 2000.
14. Kim JS, Dailey R. Biostatistics for oral health care. Ames, IA: Wiley Munksgaard, 2008.
15. Harkness JA. Improving the comparability of translation. In: Jowell R, Roberts C, Fitzgerald R, Eva G, eds. Measuring attitudes cross-nationally: lessons from the European social survey. London: Sage, 2007:79-94.
16. Harkness JA. Questionnaire translation. In: Harkness JA, Van de Vijver FJR, Mohler PPH, eds. Cross-cultural survey methods. Hoboken, NJ: John Wiley, 2003:33-56.
17. Survey Research Center. Guidelines for best practice in cross-cultural surveys. Ann Arbor, MI: Survey Research Center, Institute for Social Research, University of Michigan, 2010.
18. SurveyMonkey. Response rates and surveying techniques: tips to enhance survey respondent participation, 2009. At: http://s3.amazonaws.com/SurveyMonkeyFiles/Response_Rates.pdf. Accessed: January 25, 2012.
19. Nulty DD. The adequacy of response rates to online and paper surveys: what can be done? Assess Eval Higher Educ 2008;33(3):301-14.
20. Putnam RD, Yonish S. How important is response rate? An evaluation of a "mail panel" survey archive. Working Paper. Cambridge, MA: JFK School of Government, Harvard University, 1999.
21. Scott K, Kennedy C, Dimock M, Best J, Craighill P. Gauging the impact of growing nonresponse on estimates from a national RDD telephone survey. Public Opin Q 2006;70(5):759-79.
22. Holbrook AL, Krosnick JA, Pfent A. The causes and consequences of response rates in surveys by the news media and government contractor survey research firms. In: Lepkowski JM, Tucker C, Brick JM, De Leeuw ED, Japec L, Lavrakas PJ, et al., eds. Advances in telephone survey methodology. New York: Wiley, 2007.
23. Hewlett ER, Davidson PL, Nakazono TT, Baumeister SE, Carreon DC, Freed JR. Effect of school environment on dental students' perceptions of cultural competency curricula and preparedness to care for diverse populations. J Dent Educ 2007;71(6):810-8.
24. Gundersen D, Bhagavatula P, Pruszynski JE, Okunseri C. Dental students' perceptions of self-efficacy and cultural competence with school-based programs. J Dent Educ 2012;76(9):1175-82.

25. Altshuler L, Sussman NM, Kachur E. Assessing changes in intercultural sensitivity among physician trainees using the intercultural development inventory. Int J Intercult Relations 2003;27(4):387-401.
26. Novak KF, Whitehead AW, Close JM, Kaplan AL. Students' perceived importance of diversity exposure and training in dental education. J Dent Educ 2004;68(3):355-60.
27. Smith CS, Ester TV, Inglehart MR. Dental education and care for underserved patients: an analysis of students' intentions and alumni behavior. J Dent Educ 2006;70(4):398-408.
28. Broder HL, Janal M. Promoting interpersonal skills and cultural sensitivity among dental students. J Dent Educ 2006;70(4):409-16.
29. Nakazono TT, Davidson PL, Andersen RM. Oral health belief in diverse populations. Adv Dent Res 1997;11(2):235-44.
30. Damiano PC, Brown ER, Johnson JD, Scheetz JP. Factors affecting dentist participation in a state Medicaid program. J Dent Educ 1990;54(11):638-43.
31. Eklund SA, Pittman JL, Clark SJ. Michigan Medicaid's healthy kids dental program: an assessment of the first twelve months. J Am Dent Assoc 2003;134(11):1509-15.
32. Thind A, Atchison K, Andersen R. What determines positive student perceptions of extramural clinical rotations? An analysis using 2003 ADEA senior survey data. J Dent Educ 2005;69(3):355-62.
33. Singh A, Purohit B. Global oral health course: perception among dental students in central India. Eur J Dent 2012;6(3):295-301.
34. Bimstein E, Gardner QW, Riley JL, Gibson RW. Educational, personal, and cultural attributes of dental students' humanitarian trips to Latin America. J Dent Educ 2008;72(12):1493-509.
35. Wynn LA, Krause DW, Kucine A, Trehan P, Goren AD, Colosi DC. Evolution of a humanitarian dental mission to Madagascar from 1999 to 2008. J Dent Educ 2010;74(3):289-96.
36. Martinez-Mier EA, Soto-Rojas AE, Stelzner SM, Lorant DE, Riner ME, Yoder KM. An international, multidisciplinary, service-learning program: an option in the dental school curriculum. Educ Health 2011;24(1):259.
37. Rubin RW. Developing cultural competence and social responsibility in preclinical dental students. J Dent Educ 2004;68(4):460-7.
38. Magee KW, Darby ML, Connolly IM, Thomson E. Cultural adaptability of dental hygiene students in the United States: a pilot study. J Dent Hyg 2004;78(1):22-9.
39. Huang C, Bian Z, Tai B, Fan M, Chiu-Yin K. Dental education in Wuhan, China: challenges and changes. J Dent Educ 2007;71(2):304-11.
40. Holmgren C, Benzian H. Dental volunteering: a time for reflection and a time for change. Br Dent J 2011; 210(11):513-6.
41. Dickson M, Dickson GG. Volunteering: beyond an act of charity. J Can Dent Assoc 2005;71:865-9.
42. Berg R, Berkey DB. University of Colorado School of Dentistry's advanced clinical training and service program. J Dent Educ 1999;63(12):938-43.
43. Graham BS. Educating dental students about oral health care access disparities. J Dent Educ 2006;70(11):1208-11.