Original Article

Exploring the Effectiveness of Dental Public Health Education in Enhancing Student Competency for Refugee Care

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Abstract

Background: As global migration rises, dental professionals must be prepared to treat refugee communities' particular oral health needs, emphasizing the need of education and training in readiness to treat these underserved groups. **Aim:** The objective of this study was to evaluate the effectiveness of the Dental Public Health (DPH) Field Study course on fifth-year dental students' willingness to provide care for refugee patients. **Methods:** In this descriptive study, fifth-year students at Hacettepe University's Faculty of Dentistry were invited to participate in this study. Students were categorized into two groups based on whether they had completed the DPH field study course. Participants completed a questionnaire assessing their self-reported knowledge, experience, and attitudes toward refugee patients. Data were analyzed using Chi-square and Fisher's exact tests. **Results:** Students who completed the DPH field study course reported gaining most of their knowledge about refugees from the course, whereas those who did not complete the course primarily obtained their information through social media. Furthermore, attitudes toward caring for refugee patients were significantly more positive among students who had completed the course ($P<0.05$). However, the willingness to volunteer for programs providing oral health care to refugee patients was higher among students who had not completed the course. Additionally, a higher rate of volunteering was significantly associated with students who were satisfied with their profession ($P<0.05$) and tended to be higher among female students ($P>0.05$). **Conclusion:** The DPH field study course positively influenced students' knowledge, experience, and willingness to provide care for refugee patients. Moreover, volunteering to participate in oral health care programs was positively correlated with a professional satisfaction and female gender. Further research involving a larger and more diverse group of students from different faculties is recommended to validate these findings.

Keywords: *Cross-cultural training, cultural competence in dentistry, dental education, dental public health, healthcare attitudes, refugee health care*

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Introduction

Throughout history, Turkey has been an 'immigration' and 'emigration' country due to its strategic geographical location. Over the past decade, political turbulence in the Middle East, particularly the Syrian civil war that commenced in 2011, has significantly accelerated immigration rates to their peak, prompting Turkey to adopt an 'open door' policy. Consequently, Turkey has welcomed nearly 3.6 million Syrian refugees, granting them temporary protection status. However, the scarcity of temporary shelters and refugee centers has forced many refugees to integrate into the Turkish population, inducing significant socioeconomic changes within the country.[1]

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By 2013, Turkey became the host to the largest refugee population globally.[2]

Despite ongoing efforts, the lack of a permanent resolution to these migration issues means that the influx of refugees continues to pose substantial challenges across economic, legal, social, and health sectors.[3] From a healthcare perspective, the daily demands on the system have grown, complicated by the increasingly diverse cultural, value, and background spectra of the population.[4]

The concept of deterritorialization encompasses various challenges, notably in health, where emotional, physical, and epidemiological stresses frequently emerge due to displacement conditions.[5,6] Oral health issues, often exacerbated by poor hygiene and limited access to essential healthcare services, represent a critical area of concern.[7] Communication barriers, lack of knowledge, and prevalent negative attitudes further complicate healthcare delivery, emphasizing the need for comprehensive training in cultural competence among healthcare professionals.[8]

Bias toward a certain population among healthcare professionals can form a powerful barrier in front of the delivery of healthcare services. Despite the ethical obligation to treat all community members equally, ingrained societal prejudices can discourage treatment engagement, potentially escalating into broader public health issues.[9] Recognizing oral healthcare as a fundamental human right underscores the imperative for a diverse, culturally adept workforce capable of addressing the needs of vulnerable populations, including refugees.[10,11] It is a fact that the willingness of a dentist toward caring for vulnerable patients can be rooted in his/her dental education.[12-15] Therefore it is the dentistry faculties' duty to engage students in cross-cultural and vulnerable person training,[16] provide cultural competency/transcultural skill building, and arrange their curriculums in order to reduce oral health disparities.[17]

Many dentistry faculties have incorporated "Dental Public Health" (DPH) practical field studies and theoretical courses into their curriculums in order to increase awareness for special needs of vulnerable populations, realize the social determinants of poor oral health, and provide specialized education opportunities for students.[18-22] It has also been stated that such courses assist students to comprehend oral health disparities[23,24] and increase their commitment in providing care for diversified populations.[23,25,26] Although the consequences of these courses seem promising, the effect of education on students' knowledge, experiences, and attitudes toward vulnerable populations has only recently begun to be studied. Therefore, evidence-based data about how dental public health education and students' characteristics may affect their attitudes toward vulnerable populations are required to enhance dental education and to prepare a workforce that can address oral health disparities.

This study aims to explore the impact of the 'DPH Field Study' on fifth-year dental students' knowledge, experience, and readiness to provide care to refugee patients. Additionally, it seeks to analyze the correlation between students' personal characteristics and their propensity to work with refugee populations, with a view to further refining dental education to address oral health disparities effectively.

Materials and Methods

Sample size calculation

To ensure a sufficiently large sample size and enhance the statistical power of the study, the total sample size was calculated using the G-Power software. Chi-square tests indicated a minimum of 59 participants per group to detect an effect size of f =0.3 between the study groups. The predetermined parameters were set at 90% power and a 5% alpha error. However, to further ensure data validity, the number of participants was increased to min. of 60 per group.

Study design

This descriptive study was conducted at Hacettepe University Faculty of Dentistry as part of the "Dental Public Health Field Study" course, which is compulsory for 5th-year dental students. The study protocol was reviewed and approved by the local administrative management of Hacettepe University Faculty of Dentistry. The study population consisted of all final-year dental students (150 students) enrolled at Hacettepe University Faculty of Dentistry during the 2019–2020 academic year. While all students were required to take the course, participation in the study was voluntary, and 131 students consented to participate. The selection of participants was based on convenience sampling as the students who agreed to take part were included in the study due to their availability and willingness to participate. The first group (61 students) had completed the course in the first semester, while the second group (70 students) had just started the course at the time of data collection.

The first group were informed about the ways to benefit from healthcare services for Syrian refugees in Turkey, and they had the chance to communicate with these refugees face-to-face to provide oral and dental health information. The course contained didactic sessions, movie screenings, and field study. The students initially

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attended didactic sessions led by expert guest speakers. These sessions provided information about the refugee population in Turkey, health policies affecting refugees, and current barriers to healthcare access for refugees in the country. Afterward, the students watched a film about refugees, followed by field studies where they conducted intraoral examinations on refugee patients. After the oral examinations, the students informed the patients about their current oral health status and provided guidance on improving their oral hygiene practices. Participation in these activities was entirely voluntary. Students willing to participate were required to sign a written informed consent form and submit it to the responsible investigator. To encourage participation, students were assured that all collected data, including questionnaire responses, would be kept confidential.

Data collection

Data collection occurred during the first week of the second semester, in classrooms, and within school hours. We used a self-administered, structured questionnaire, modeled on similar surveys found in the literature.[6,27-29] Students completed the questionnaire independently and submitted it to the responsible investigator in sealed envelopes. The questionnaire included 17 questions designed to gather personal data as well as participants' knowledge, experience, and willingness to provide care to refugee patients. Questions 1–4 collected sociodemographic information such as gender, date of birth, and province of origin. Questions 5–7 addressed the students' attitudes toward the dentistry profession, and questions 8–17 focused on their knowledge, experience, and attitudes regarding refugee patients. We pilot-tested the questionnaire on 15 randomly selected students from other universities at the same academic level and made minor revisions based on their feedback to enhance question clarity.

The questionnaire featured various types of questions, including 'yes' or 'no', Likert scale, nominal, and open-ended formats. For example, the options for the question 'What is your mood about your profession?' included 'very satisfied', 'satisfied', 'neither satisfied nor dissatisfied', 'dissatisfied', and 'very dissatisfied'. For questions regarding participants' willingness to provide oral and dental healthcare, responses ranged from 'highly willing' to 'highly unwilling', with 'highly willing', 'willing', and 'seeing it as a duty' categorized as positive responses, and 'unwilling' and 'highly unwilling' as negative responses in our statistical analysis.

The students identified challenges they encountered while treating patients by selecting one or more of the following issues: communication difficulties, infection, disrespect, use of impolite language, patients' distrust of intern dentists, priority requests during care and treatment services, and verbal violence. An option for 'other' was provided, allowing for open-ended responses. The participants also evaluated these issues specifically in the context of treating refugee patients.

Statistical analysis

Statistical analysis was carried out by using SPSS Version 20.0 (Chicago, SPSS Inc.). Numbers, percentages for qualitive data, and distribution statistics were estimated for quantitative data. Chi-square and Fisher's exact tests were used to test the significance of the differences between categorical variables. Statistical significance level was accepted as <0.05.

Results

A total of 131 5th-year students (90 female, 41 male) with the mean age of 23.2 ± 0.9 participated in this study. 6.9% of the students were coming abroad, and 44.3% were from Central Anatolia Region, while others were from the rest of Turkey. Fifty students stated that they would like to change their profession, while 123 students stated they chose to study dentistry by their own will and two-third of these students were satisfied or highly satisfied with their profession [Table 1].

Out of 131 students, 61 (46.6%) had completed "DPH Field Study" course in the first semester, while others had not. Two-third (64.9%) of all had a contact with a refugee, while 62.4% of these students had that contact within the scope of the "DPH Field Study" [Table 2]. Twenty-four (34.3%) out of 70 students who did not complete the course stated a contact history with a refugee. The difference of having any contact with refugees/refugees between the students having completed and not completed the course was statistically significant ($P < 0.001$) [Table 2].

The source of knowledge that students had about refugees was significantly different ($P < 0.001$) between both groups according to completion of "DPH Field Study" course. Two-third (65.7%) of the students who did not complete the course stated that they had gained the knowledge about refugees mostly from the social media, while half (52.5%) of the students who completed the course stated that they had gained the knowledge mostly from the "DPH field study "course [Table 2].

Students who completed the 'DPH Field Study' exhibited a more positive attitude toward treating both nonrefugee patients referred to the faculty and refugee patients. Statistically significant differences in mood were observed between the two groups for treating

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Table 1: Some characteristics of the students according to completion of the dph field study

Characteristics	DPH Field Study Not completed		DPH Field Study completed	
	n	(%)	*n*	(%)
Sex				
Female	45	64.3	45	73.8
Male	25	35.7	16	26.2
Age				
	X±sd: 23.4±0.9; median: 23 ;1.Quartile: 23;3. Quartile: 24 ; min: 22 - max: 25		X±sd: 23±0.7; median: 23 ; 1.Quartile: 22-3. Quartile: 24 ; min: 22 - max: 25	
Hometown				
Central Anatolia Region	28	40.0	30	49.2
Marmara Region	11	15.7	17	27.9
Mediterranean Region	9	12.9	6	9.8
Abroad	4	5.7	5	8.2
Aegean Region	6	8.6	2	3.3
Black sea Region	5	7.1	1	1.6
Southeastern Anatolia Region	5	7.1	0	
Eastern Anatolia Region	2	2.9	0	
Choosing Dentistry with own will				
No	4	5.7	4	6.6
Yes	66	94.3	57	93.4
Changing the profession if having an opportunity				
No	27	38.6	22	36.1
Yes	26	37.1	24	39.3
No idea	17	24.3	15	24.6
Mood about profession				
Very satisfied	16	22.9	7	11.5
Satisfied	32	45.7	30	49.2
Neither satisfied nor dissatisfied	18	25.7	20	32.8
Dissatisfied	4	5.7	20	32.8
Very dissatisfied	0		0	

nonrefugee ($P = 0.030$) and refugee patients ($P = 0.023$) as shown in Table 2. Among the participants who exhibited a negative attitude toward caring for refugee patients (n = 21), 16 had not completed the course. Furthermore, while not statistically significant, a higher proportion of students who completed the course and received theoretical education about treating vulnerable groups, such as refugees, showed a greater willingness to provide treatment. On the other hand, a higher rate of participants stated that practical education might negatively impact their willingness to volunteer for treating refugee patients [Table 2]. Among the students, 45.7% had not completed the 'DPH Field Study' course, and 34.4% had volunteered for programs providing oral health care to refugee patients; this difference was statistically significant ($P = 0.014$) [Table 2]. Additionally, a higher percentage of female students volunteered for these programs compared to male students ($P = 0.067$). Specifically, within the group that did not complete the course, females were more willing to volunteer ($P = 0.040$), while no significant difference was observed in the group that completed the course ($P = 0.057$). Moreover, the willingness to volunteer for these programs significantly correlated with participants' general mood about their profession ($P = 0.044$) [Table 3].

The analysis revealed no significant differences in the types of problems encountered during the provision of oral health care, based on whether students had completed the 'DPH Field Study' course [Table 4]. Likewise, the completion of the 'DPH Field Study' course did not significantly influence the nature of problems encountered when treating refugee patients. Concerning course content modifications to enhance students' willingness to volunteer for public health programs that provide oral health care to refugee patients, approximately one-fourth (27.1%, n = 19) of the students had not completed the course and one-fifth (19.7%, n = 12) had abstained from responding to the question.

Among the students who have not completed the course, 8 (11.4%) participants stated "this course needs

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Table 2: Distribution of the students' experiences and knowledge about refugees according to the completion of dph field study

	DPH Field Study		Total	*P**
	Not Completed *n* (%)[a]	Completed *n* (%)[a]	*n* (%)[a]	
Any contact with a refugee				<0.001
No	46 (65.7)	0 (0.0)	46 (35.1)	
Yes	24 (34.3)	61 (100.0)	85 (64.9)	
Total	70 (100.0)	61 (100.0)	131 (100.0)	
Contact was				<0.001**
Within the scope of the "Dental Public Health Field Study"	0 (0.0)	53 (86.9)	53 (62.4)	
In the social life	19 (79.2)	8 (13.1)	27 (31.7)	
In the faculty as a patient	5 (20.8)	0 (0.0)	5 (5.9)	
Total	24 (100.0)	61 (100)	85 (100.0)	
Getting the mostly knowledge about refugees from				<0.001**
Social media	46 (65.7)	15 (24.6)	61 (46.6)	
Dental Public Health Field Study	0 (0.0)	32 (52.5)	32 (24.4)	
Lectures (theoretical)	0 (0.0)	1 (1.6)	1 (0.8)	
News	23 (32.9)	13 (21.3)	36 (27.4)	
Immigrant's oneself	1 (1.4)	0 (0.0)	1 (0.8)	
Total	70 (100.0)	61 (100.0)	131 (100.0)	
Mood related to caring for a non-refugee patient presenting in the faculty				0.030***
Positive manner	64 (91.4)	61 (100.0)	125 (95.4)	
Negative manner	6 (8.6)	0 (0.0)	6 (4.6)	
Total	70 (100.0)	61 (100.0)	131 (100.0)	
Mood related to caring for a refugee patient				0.031***
Positive manner	54 (77.1)	56 (91.8)	110 (84.0)	
Negative manner	16 (22.9)	5 (8.2)	21 (16.0)	
Total	70 (100.0)	61 (100.0)	131 (100.0)	
The influence of theoretical education on volunteering for caring refugees (self-report)				0.738
No	23 (32.9)	18 (29.5)	41 (31.3)	
Yes, in a positive way	38 (54.3)	37 (60.7)	75 (57.3)	
Yes, in a negative way	9 (12.8)	6 (9.8)	15 (11.4)	
Total	70 (100.0)	61 (100.0)	131 (100.0)	
The influence of practical education on volunteering for caring refugees (self-report)				0.957
No	22 (31.4)	19 (31.1)	41 (31.3)	
Yes, in a positive way	40 (57.2)	34 (55.6)	74 (56.5)	
Yes, in a negative way	8 (11.4)	8 (13.2)	16 (12.2)	
Total	70 (100.0)	61 (100.0)	131 (100.0)	
Be a volunteer for the programs providing oral health care for an immigrant/refugee patient				0.014
No	29 (41.4)	19 (31.2)	48 (36.6)	
Yes	32 (45.7)	21 (34.4)	53 (40.5)	
No idea	9 (12.9)	21 (34.4)	30 (22.9)	
Total	70 (100.0)	61 (100.0)	131 (100.0)	

*Pearson Chi-Square Test. **Exact Test. ***Fisher's Exact Test. [a]Column Percentage

to be elective", 14 (20.0%) stated "The course doesn't improve the willingness to volunteer for public health programmes providing oral health care for refugee/refugee patients", 2 (2.9%) stated they have no idea, 11 (15.7%) stated "presentations related with refugees may improve willingness to volunteer for public health programmes providing oral health care for refugee patients", and 16 (23.2%) stated "contacts with refugees in the field conditions may improve willingness to volunteer for public health programmes providing oral health care for refugee patients as well". Among the students who completed the course, 7 (11.5) stated "this course needs to be elective", 5 (8.2%) stated "The course doesn't improve the willingness to volunteer for

Table 3: Distrubution of volunteering rates for the programs providing oral health care for refugee patients according to the students' various characteristics

Characteristic		Be a volunteer for the programs providing oral health care for an immigrant/refugee patient			Total *n* (%)[a]	*P**
		No *n* (%)[a]	Yes *n* (%)[a]	No idea *n* (%)[a]		
Completing the DPH Field study	Sex					
No	Female	14 (31.1)	23 (51.1)	8 (17.8)	45 (100.0)	0.040
	Male	15 (60.0)	9 (36.0)	1 (4.0)	25 (100.0)	
	Total	29 (41.4)	32 (45.7)	9 (12.9)	70 (100.0)	
Yes	Female	14 (31.1)	14 (31.1)	17 (37.8)	45 (100.0)	0.575
	Male	5 (31.2)	7 (43.8)	4 (25.0)	16 (100.0)	
	Total	19 (31.1)	21 (34.4)	21 (34.4)	61 (100.0)	
Total	Female	28 (31.1)	37 (41.1)	25 (27.8)	90 (100.0)	0.067
	Male	20 (48.8)	16 (39.0)	5 (12.2)	41 (100.0)	
	Total	48 (36.6)	53 (40.5)	30 (22.9)	131 (100.0)	
Completing the DPH Field study	Mood about profession					
No	Very satisfied	7 (43.8)	9 (56.2)	0 (0.0)	16 (100.0)	0.675**
	Satisfied	12 (37.5)	15 (46.9)	5 (15.6)	32 (100.0)	
	Neither satisfied nor dissatisfied	8 (44.4)	7 (38.9)	3 (16.7)	18 (100.0)	
	Dissatisfied	2 (50.0)	1 (25.0)	1 (25.0)	4 (100.0)	
	Total	29 (41.4)	32 (45.7)	9 (12.9)	70 (100.0)	
Yes	Very satisfied	1 (14.3)	5 (71.4)	1 (14.3)	7 (100.0)	0.051**
	Satisfied	13 (43.3)	10 (33.3)	7 (23.3)	30 (100.0)	
	Neither satisfied nor dissatisfied	5 (25.0)	5 (25.0)	10 (50.0)	20 (100.0)	
	Dissatisfied	0 (0.0)	1 (25.0)	3 (75.0)	4 (100.0)	
	Total	19 (31.1)	21 (34.4)	21 (34.4)	61 (100.0)	
Total	Very satisfied	8 (34.8)	14 (60.9)	1 (4.3)	23 (100.0)	0.046**
	Satisfied	25 (40.3)	25 (40.3)	12 (19.4)	62 (100.0)	
	Neither satisfied nor dissatisfied	13 (34.2)	12 (31.6)	13 (34.2)	38 (100.0)	
	Dissatisfied	2 (25.0)	2 (25.0)	4 (50.0)	8 (100.0)	
	Total	48 (36.6)	53 (40.5)	30 (22.9)	131 (100.0)	
Completing the DPH Field study	Mood related to caring for an immigrant patient					
No	Positive manner	19 (35.2)	28 (51.9)	7 (13.0)	54 (100.0)	0.118**
	Negative manner	10 (62.5)	4 (25.0)	2 (12.5)	16 (100.0)	
	Total	29 (41.4)	32 (45.7)	9 (12.9)	70 (100.0)	
Yes	Positive manner	15 (26.8)	21 (37.5)	20 (35.7)	56 (100.0)	0.036**
	Negative manner	4 (80.0)	0 (0.0)	1 (20.0)	5 (100.0)	
	Total	19 (31.1)	21 (34.4)	21 (34.4)	61 (100.0)	
Total	Positive manner	34 (30.9)	49 (44.5)	27 (24.5)	110 (100.0)	0.008**
	Negative manner	14 (66.7)	4 (19.0)	3 (14.3)	21 (100.0)	
	Total	48 (36.6)	53 (40.5)	30 (22.9)	131 (100.0)	

*Pearson Chi square. **Exact test. [a]Row percentage

public health programmes providing oral health care for refugee patients", 18 (29.5) stated "within the lesson, the time spent in the field was sufficient", and 19 (30.6%) stated "having contact with refugees in the field conditions may improve the willingness to volunteer for public health programmes providing oral health care for refugee patients".

Discussion

The "DPH Field Study" course provides students with direct engagement opportunities with underserved populations, including individuals with disabilities, the elderly, women, children, and refugees. The objective of this study was to assess the influence of the DPH field

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Table 4: Analysis of problems encountered with refugee and nonrefugee patients during oral health care delivery at the faculty based on completion of the DPH field study by students

Problems	With the immigrants DPH Field Study				With non-immigrant patients at faculty DPH Field Study			
	Not Completed *n* (%)[a]	Completed *n* (%)[a]	Total	*P**	Not Completed *n* (%)[a]	Completed *n* (%)[a]	Total	*P**
Communication				1.000**				0.959
No	4 (5.7)	3 (4.9)	7 (5.3)		29 (65.7)	25 (0.0)	54 (41.2)	
Yes	66 (94.3)	58 (95.1)	124 (94.7)		41 (34.3)	36 (100.0)	77 (58.8)	
Total	70 (100.0)	61 (100.0)	131 (100.0)		70 (100.0)	61 (100.0)	131 (100.0)	
Infection				0.575				0.354
No	22 (31.4)	22 (36.1)	44 (33.6)		38 (54.3)	38 (62.3)	76 (58.0)	
Yes	48 (68.6)	39 (63.9)	87 (66.4)		32 (45.7)	23 (37.7)	55 (42.0)	
Total	70 (100.0)	61 (100.0)	131 (100.0)		70 (100.0)	61 (100.0)	131 (100.0)	
Disrespect				0.968				0.428
No	53 (75.7)	46 (75.4)	99 (75.6)		30 (42.9)	22 (36.1)	52 (39.7)	
Yes	17 (24.3)	15 (24.6)	32 (24.4)		40 (57.1)	39 (63.99)	79 (60.3)	
Total	70 (100.0)	61 (100.0)	131 (100.0)		70 (100.0)	61 (100.0)	131 (100.0)	
Impolite language use				0.089				0.906
No	47 (67.1)	49 (80.3)	96 (73.3)		36 (51.4)	32 (52.5)	68 (51.9)	
Yes	23 (32.9)	12 (19.7)	35 (26.7)		34 (48.6)	29 (47.5)	63 (48.1)	
Total	70 (100.0)	61 (100.0)	131 (100.0)		70 (100.0)	61 (100.0)	131 (100.0)	
Mıstrust				0.916				0.216
No	59 (84.3)	51 (83.6)	110 (84.0)		19 (27.1)	11 (18.0)	30 (22.9)	
Yes	11 (15.7)	10 (16.4)	21 (16.0)		51 (72.9)	50 (82.0)	101 (87.1)	
Total	70 (100.0)	61 (100.0)	131 (100.0)		70 (100.0)	61 (100.0)	131 (100.0)	
Prioritization of Service Requests				0.816				0.760
No	54 (77.1)	46 (75.4)	100 (76.3)		34 (48.6)	28 (45.9)	62 (47.3)	
Yes	16 (22.9)	15 (24.6)	31 (23.7)		36 (51.4)	33 (54.1)	69 (52.7)	
Total	70 (100.0)	61 (100.0)	131 (100.0)		70 (100.0)	61 (100.0)	131 (100.0)	
Verbal violence				0.846				0.325
No	60 (85.7)	53 (86.9)	113 (86.3)		55 (78.6)	52 (85.2)	107 (81.7)	
Yes	10 (14.3)	8 (13.1)	24 (13.7)		15 (21.4)	9 (14.8)	24 (18.3)	
Total	70 (100.0)	61 (100.0)	131 (100.0)		70 (100.0)	61 (100.0)	131 (100.0)	

*Pearson Chi-Square Test. **Fisher' Exact Test. [a]Column Percentage

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study on the experiences, knowledge, and preparedness of dental students in providing treatment for refugee patients. The purpose of the research is to aid dental educators in designing their curricula.

Reis *et al*.[30] suggested that dental institutions should adopt strategies, such as creating outreach programs, to raise student awareness of underserved populations. The willingness of dentists to care for these groups often reflects their educational background.[13,14] In this regard, dental education plays a crucial role in promoting health equity by removing barriers to healthcare accessibility.[17] The knowledge acquired by dental students can significantly shape their attitudes toward vulnerable groups.[29] A study by Dao *et al*.[14] found that clinicians who felt better educated to treat underserved populations had more positive attitudes toward these patients. It was also noted that integrating management of diseases common among refugees into the curriculum not only improved clinicians' attitudes toward refugees[31] but also increased their comfort level in treating them.[32] We consider these findings to be highly significant as they emphasize the importance of dentistry education in promoting cultural competency, transcultural abilities, and addressing healthcare inequities.

Based on the results of this study, 62.4% of the students who reported contact with refugee patients had that interaction through the "DPH field study" course. There is a significant difference in exposure to refugee patients between students who have taken this course and those who have not. This suggests that at the very least, the "DPH field study" provides valuable experience in interacting with refugee patients. Furthermore, since values and attitudes can be influenced by engagement with individuals from different cultural backgrounds or through education,[33] such interactions could beneficially enhance attitudes toward certain underserved groups.

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The students who completed the lesson have reported that they have gained knowledge about refugees through DPH field study, while the students who did not complete had the information from social media. One of the key elements to make medical professionals more effective providing healthcare to underserved patients is increasing their emphatic understanding through the less fortunate.[34] Hunt and Swiggum[35] stated 'Crossing the bridge to otherness by developing a relationship with the "other" allows for the recognition of similarity' as they observed nursing students' experiences during their service work in a homeless shelter. Most dental schools in Turkey incorporated public dental health practices in their curriculum in order to gather the students with underserved patients and influence positive attitudes by inducing development of empathy. According to these studies' results, the DPH field study may be accepted as achieved its one goal, by raising awareness in dental students about refugee patients. However, although the students reported they have gained their information about refugees from DPH field study, it is important which kind of reaction (positive–negative) it triggered. In this context, the decrease of willingness to volunteer in programs providing oral health care for refugee patients in students who completed the DPH field study is tought-provoking. In this study, 45.7% of the students who had not finished the study and 34.4% of the students who had finished the DPH field study said they would volunteer for dental health care programs for refugeesa. It brings to mind that it can be more effective to influence the students in earlier years during dental education. So, the incorporation of DPH field study in curriculums from the beginning of dental education can help to achieve more satisfactory results. Similarly, Habibian *et al*.[18] observed that dental students' attitudes toward underserved population through 4 years of education showed a declining trend. On the other hand, previous studies observed positive intentions toward patients from diverse backgrounds in students who are educated from curriculums containing community service-based studies.[18,36] M. Rashid *et al*.'s[37] review revealed that the incorporation of a refugee-centered component in medical curriculums has resulted in improvement in students' self-perceptions of knowledge, communication skills, and clinical competency when caring for this population. Overall, more studies with larger groups of students should be performed for a better judgement.

However, the students' moods toward caring refugee or nonrefugee patients presenting in the faculty were more in a positive manner among the ones who completed the field study. This indicates that although the field study may have failed to encourage the students to volunteer for programs aimed at refugees, it may well have created a sense of mission on some level to care for them who are seeking medical help. We perceive this as an important achievement for the field study since this kind of motivation can be the foundation of ethics for the medical practice toward underserved groups.

We solicited student recommendations to enhance the course content, aiming to gather insights on their expectations prior to and feedback after participating in the class. Among the students who completed the course, 8.2% indicated that the field study might diminish their willingness to engage, compared to 20% among those who had not completed the course. This suggests that the field study potentially fostered a positive disposition toward caring for refugee patients. Across both groups, a majority of students believed that increased interaction with refugees in field settings could enhance their willingness to provide care. These responses support our earlier assertion that integrating field studies earlier in the dental education curriculum could be beneficial.

Previous studies reported that female students had more positive attitude than male students.[16,38,39] In the present study, overall, although the difference between sexes was not statistically significant, female students were also found to be more willing to be volunteer for dental public health programs providing oral health care for refugees. Supporting this finding, a previous research had shown that females are more likely to help others than males.[40] Diekman and Clark[41] stated that "prosocial behaviours involving sustained caregiving and concern for socially disadvantaged others tends to be enacted more by women than men". This can explain the difference between male and female students' willingness in this study. When the evaluation was deepened, we found out that in the group who did not complete the course; females were significantly more willing to volunteer; however, in the group who completed the study, the difference was not significant. Therefore, we would like to think that the course has influenced the male students toward being more willing to volunteer for dental public health programs providing oral health care for refugees. Also, students who feel satisfied about their profession were found to be more willing volunteering for programs providing oral health care for refugees. In our opinion, this finding is not surprising since it is likely that dentists, who are satisfied with their profession, are more eager to provide care for all individuals.

This study's results emphasize the need for dentistry education programs to enhance their preparation of students for serving underserved communities. It is recommended that dental faculties integrate

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comprehensive training on cultural competence and sensitivity into their curricula. Such training should include both theoretical knowledge and practical experiences as the present study indicates that hands-on field studies, like the 'DPH Field Study', can positively influence students' attitudes toward providing care to refugee and other underserved populations. Additionally, dental programs should consider early and frequent exposure to diverse patient populations to foster empathy and understanding from the beginning of the students' educational experience. To support this, partnerships with community health centers and mobile clinics could be developed, allowing students to acquire practical experience under the supervision of experienced practitioners. Ultimately, by embedding these elements deeply into the dental curriculum, faculties can enhance the preparedness of their students in addressing the diverse requirements of all community members, especially those who lack access to adequate healthcare. This approach, in turn, will contribute to the promotion of more equitable healthcare outcomes.

Regarding study limitations, it is important to note that this study was conducted with a small sample size. While the insights gained have been instrumental in enhancing the effectiveness of the "DPH Field Study" course at our faculty, these findings are not generalizable to all dental students. This is due to the fact that the study only included fifth-year students from a single institution. To obtain a more comprehensive perspective, future research should be conducted with a larger and more diverse sample from multiple institutions. Additionally, a significant limitation of this study is the lack of baseline data from students prior to their participation in the "DPH Field Study" course. The absence of precourse questionnaires means we cannot fully ascertain the effectiveness of the course as any observed changes in attitude might also be influenced by students' inherent personality traits, upbringing, or prior experiences. Furthermore, due to the cross-sectional approach used in this research, it only provides a momentary view without taking into account any changes in students' attitudes or competencies over time. In order to gain a deeper comprehension of the effects of educational interventions on student outcomes, it is recommended that future research employ a longitudinal design that monitors changes over time and across different phases of the dental education program. Finally, conducting comparative assessments among different dental schools that employ diverse curricular approaches to public health education could provide more profound insights into the most efficient techniques for equipping dental students to assist underprivileged communities.

Conclusion

Considering the limitations of this study, we conclude that the 'DPH Field Study' course appears to have had a positive influence on students' self-reported knowledge, experience, and willingness to provide care to refugee patients. However, the enthusiasm of students to participate in oral health care programs varied, suggesting that personal characteristics significantly influence their level of engagement. These findings highlight the importance of personalizing educational approaches to align more effectively with the unique characteristics of individual students which may enhance motivation and effectiveness in clinical settings. Furthermore, it highlights the need for broader curricular adjustments that consider diverse learning styles and backgrounds of students in order to optimize educational outcomes in dental public health.

Author contributions

Ece Meral- Conceptualization; methodology; writing—original draft; writing—review and editing; data curation; investigation; validation.

Cansu Özşin-Özler- writing—review and editing; methodology; data curation; investigation; validation; formal analysis.

Cansu Atalay- writing—review and editing; methodology; investigation; validation.

Meryem Uzamış-Tekçiçek- writing—review and editing; investigation; validation; formal analysis

Esra Ergin- Conceptualization; methodology; writing—review and editing; data curation; investigation; validation.

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Conflicts of interest

There are no conflicts of interest.

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