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ORIGINAL ARTICLE

Community dental visits as a catalyst for understanding oral health disparities in undergraduate dental students

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ABSTRACT

Background: Oral health disparities remain a critical public health issue, highlighting the need for experiential learning in dental education

Objective: To evaluate the impact of community dental visits on undergraduate dental students' awareness, understanding, and attitudes toward oral health disparities in underserved populations.

Methods: A descriptive cross-sectional study was conducted on 150 dental students (2nd to 4th year at Rehman College of Dentistry, Peshawar, Pakistan, from 1st March to 30th June 2023. Purposive sampling was done, and students participating in community dental visits were included. A newly developed questionnaire based on 04 major themes: awareness of students on oral health inequalities, role of community visits in raising awareness, socioeconomic factors underlying oral health disparities, and recommendations by students for dental curriculum modifications was used. SPSS version 22 was used for data analysis. Chi-square test and t-test were applied to compare responses.

Results: A response rate of 49% (73/150) was obtained with a female-to-male ratio of 45:28. Most of the dental students in 2nd, 3rd, and 4th year (82.6%, 83.3% & 95%, respectively) agreed on the lack of oral health prioritization in primary healthcare. Undergraduate dental students of the 2nd year (78-95.6%), 3rd year (76.7-93.3%) & 4th year (85-95%) recommended to increase the integration of community-based dental education in BDS. Across all years, 82–90% of the participants reported heightened motivation to address dental health disparities following community visits. There was a significant difference between responses of dental students of different years regarding awareness of oral health disparities concerning socioeconomic status ($p<0.05$). A greater proportion of fourth-year students (80%) agreed on the relevance of socio-economic status compared to third-year (40%) and second-year (43.4%) dental students.

Conclusion: Community dental visits are an effective educational strategy for enhancing undergraduate dental students' awareness and understanding of oral health disparities. Increasing their frequency may further strengthen students' attitudes toward addressing these disparities in underserved communities.

Key Words: Community Dentistry, Oral Health, Awareness, Students Dental.

DOI: 10.53685/jshmdc.v6i1.151

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Received: 28.02.24, 1st Revision: 25.11.24
2st Revision:27.03.25, 3rd Revision: 20.05.25
Accepted: 28.05.25

How to cite this article: Israr E A, Shah M, Huma Z, Qamar A, Sardar H, Ahmad S. Community dental visits as a catalyst for understanding oral health disparities in undergraduate dental students. J Shalamar Med Dent Coll. 2025; 6(1): 53-59. doi: 10.53685/jshmdc.v6i1.151

INTRODUCTION

It is estimated that oral diseases affect nearly 3.7 billion people globally.[1] Pakistan has a rich culture, with 70% of the rural population and a wide range of ethnic, social, cultural, and geographical diversity.[1,2]

This diversity accentuates the need for cultural competency within dental education frameworks to enhance awareness among undergraduate students about oral health disparities, both within Pakistan and from a global perspective.[1] Like many Southeast Asian countries, Pakistan's dental education system needs a framework that includes cultural competence to enhance students' awareness of oral health

disparities in the diverse population of Pakistan and a global perspective in general.[1] These disparities are defined as differences in oral health care that are avoidable. Familiarization with cultural diversity and acquiring cultural competency is essential for dental healthcare providers; however, their integration into mainstream undergraduate dental curricula is variable.[3]

Integrating cultural competency components into dental curricula effectively enhances students' knowledge, skills, and awareness, empowering them to provide culturally competent care.[4] It also reflects on the lack of awareness of dental students due to the absence of such cultural competency integrating components in dental curricula.[5]

Evidence points to common oral health problems due to inadequate distribution of preventive and dental health promotion activities in underserved communities.[6] as seen in Hispanic (52% dental caries, non-Hispanic blacks in the United States, 50%-60% in Pakistan, and even 80% in certain European countries.[2,7,8]

Inequalities in oral health have been reported in ethnic minorities and diverse cultural groups, with children of lower socioeconomic groups having a higher prevalence of primary teeth decay, periodontal disease, and dental trauma.[9]

In Pakistan, dental care predominantly revolves around treatment rather than prevention, with minimal focus on primary healthcare on oral health, deficient human resources, and inadequate infrastructure.[10] Dental caries have the highest burden, especially in school-going children, due to poor oral hygiene, lack of awareness, and poor oral practices. They are primarily seen in public sector schools catering to children from lower socioeconomic income groups.[10] Many researchers have identified inequalities in oral health due to socioeconomic status and ethnicity.[9]

The role of cultural diversity is also documented in literature, as is the influence of culture in healthcare beliefs, practices, and provisions. Most European cultures have a student-based learning approach, whereas most Eastern school systems work through a teacher-based approach.[11] The Schools play a significant role in raising awareness and inculcating safe oral health practices in children, particularly in preventive dental healthcare. The inclusion of community dentistry as an essential subject in the dental curriculum highlights a shared national effort to address oral health challenges in Pakistan. Khyber Pakhtunkhwa in Pakistan provides a strong example of how this curriculum is being implemented to integrate academic learning with practical community engagement. This practical engagement model can differ in scale and focus based on local community needs, emphasizing urban outreach and others in rural communities. Thus, the curriculum needs modification to increase awareness of community oral health needs by standardizing longer and structured community-based dental education undergraduate programs.

The undergraduate dental curriculum in KP has community dentistry as a significant subject, which enables students to visit public and private schools for awareness of community oral health problems and the disparities in oral health.

The study aimed to evaluate the impact of community dental visits on undergraduate dental students' awareness, understanding, and attitudes toward oral health disparities in underserved populations.

METHODS

A descriptive cross-sectional study was conducted at Rehman College of Dentistry, Peshawar, Pakistan, from 1st March to 30th June 2023. Purposive sampling included all (150) dental students of 2nd, 3rd & 4th year BDS who had completed their community dental visits. The 1st Year dental students were excluded as they had not completed their community visits.

A newly developed questionnaire based on four major themes: awareness of students, role of community dental visits, socioeconomic factors, and students' recommendations for dental curriculum, was developed through expert consultation. Content validity was ensured through expert review, while face validity was assessed via participants' feedback in the pilot study conducted on 10% of the target population after ethical approval. The Reliability Coefficient (Cronbach's alpha) was calculated as 0.78 for the whole questionnaire.

Once we established the questionnaire's internal validity and reliability, it was distributed online via Google Forms. The questionnaire consisted of 20 closed-ended questions related to 04 major themes, addressing oral health disparities on a 3-point Likert scale. Oral health disparities refer to differences in oral health outcomes like access to care linked to factors like socioeconomic status, age, etc, leading to unequal distribution of oral health.

Themes with operational definitions are given below:

1. Awareness of oral health inequalities of students, - how much the students understand the meaning of "disparities" or "Health Inequality"
2. Role of community (public and private school) dental visits in raising awareness– an awareness by the dental students that community visits provide an early opportunity for understanding these inequalities
3. Socioeconomic factors underlying oral health disparities observed by students–the factors followed by students during community visits that contributed to causing the disparities
4. Recommendations by students for dental curriculum modifications to improve community oral health awareness in undergraduate students.

Ethical Approval

The study was conducted from 1st March to 30th June 2023 at Rehman College of Dentistry, Peshawar, Pakistan, after taking approval from the Review Board and Ethical Committee (RMI/RMI-REC/Article Approval /70) of Rehman College of Dentistry, Rehman Medical Institute, Peshawar, Pakistan on 22nd February 2023.

Statistical Analysis

The data obtained were organized and entered into SPSS version 22 for analysis. Descriptive statistics (frequency, mean ± SD) were used to analyze four key indicators of community oral health, with the aim of identifying underlying oral health disparities. The Chi-square test was applied for group comparisons. Despite the reduced sample size, all expected cell frequencies exceeded 05, satisfying assumptions for the Chi-square test. An independent sample t-test was applied to determine the gender differences among undergraduate dental students regarding perception of oral health disparities.

RESULTS

The response rate for this survey was 49% (73/150), obtained over four months. Table 1 shows the gender distribution with more female respondents in the 2nd and 3rd year BDS and more male respondents from the 4th year BDS (p=0.054). There was no significant association between gender and academic year (p=0.054). Although the comparison was not statistically significant, the near-threshold p value suggests a potential trend in gender distribution across academic years.

The demographic composition provides adequate variation to support descriptive and exploratory analyses. However, inferential findings, particularly subgroup comparisons, should be interpreted cautiously due to limited statistical power.

There was no significant (p>0.05) difference regarding perception of oral health disparities between undergraduate dental male and female students. (Table: 2)

Table 1: Gender distribution of the undergraduate dental students across three professional years

	Gender			
Professional Year of study	**Male n (%)**	**Female n (%)**	**Total**	**χ^2/p**
2nd year BDS	8 (28.6)	15(33.3)	23(31.5)	5.86/ 0.054
3rd year BDS	8 (28.6)	22(48.9)	30(41.1)	
4th year BDS	12 (42.9)	8(17.8)	20(27.4)	
Total	28 (100)	45(100)	73(100)	

Chi-square test applied. p<0.05 was statistically significant

Table 2: Perceptions of male and female undergraduate dental students about oral health disparities

Groups	**N**	**mean± SD**	**p value**
Male	28	2.26±0.39	0.499
Female	45	2.31±0.49	

Independent sample t-test was applied. p<0.05 was statistically significant

Data were analyzed under four main themes, as shown in Table 3.

Awareness of oral health disparities:

Table 3 compares undergraduate students' responses across the three years with the main themes inquired about. There was a significant difference between responses of dental students of different years regarding awareness of oral health disparities concerning socioeconomic status (p<0.05). A greater proportion of fourth-year students (80%) agreed on the relevance of socio-economic status compared to third-year (40%) and second-year (43.4%) dental students. Notably, disagreement decreased progressively from the second year (47.8%) to the fourth year (20%). There was no significant difference in knowledge of oral health disparities for the remaining variables across all professional years. The levels of agreement observed among 2nd, 3rd, and 4th-year students were 82.6%, 83.3%, and 95%, respectively, indicating that

they recognized the lack of oral health prioritization in primary healthcare, a key factor contributing to community oral health disparities (Table: 3).

Role of community dental visits (public and private schools)

Students across all professional years unanimously agreed that oral health knowledge dissemination in public school systems was insufficient, as it was not considered a priority. Most participants (2nd, 3rd & 4th) reported the high levels of motivation, 87.6%, 90%, and 85%, respectively, after community (public and private school) dental visits (Table:3).

Socioeconomic and cultural factors

There was an even distribution of opinion regarding socioeconomic factors underlying oral health disparities observed by students, with no significant difference in responses according to the year of study. However, 82.6% of students of the 2nd year BDS agreed compared to others for the difference in quality of education of public & private school systems in Peshawar, who had recently undergone their community school visits (Table 3).

Table 3: Comparison of responses related to the four main themes across dental undergraduate students by year of study

Main themes	Responses									p value
	Agree			Neutral			Disagree			
	2nd yr n (%)	3rd yr n (%)	4th yr n (%)	2nd yr n (%)	3rd yr n (%)	4th yr n (%)	2nd yr n (%)	3rd yr n (%)	4th yr n (%)	
Awareness of oral health disparities										
Socio economic status	10 (43.4)	12 (40)	16 (80)	02 (8.7)	05 (16.7)	0	11 (47.8)	13 (43.3)	04 (20)	**0.038***
Existing oral health disparities	16 (73.9)	03 (63)	01 (80)	01 (4.3)	07 (23.3)	03 (15)	05 (21.7)	04 (13.3)	01 (5)	0.214
Lack of prioritization of dental healthcare	19 (82.6)	25 (83.4)	19 (95)	01 (4.3)	03 (10)	01 (5)	03 (13)	02 (6.7)	0	0.46
Disparities leading to misconceptions of oral health	16 (69.6)	18 (62.1)	14 (70)	05 (21.7)	05 (17.2)	05 (25)	02 (8.6)	06 (20.6)	01 (5)	0.52
Role of public/private school visits										
Public versus private school	11 (47.8)	15 (50)	07 (35)	06 (26.1)	08 (26.7)	04 (20)	06 (26)	07 (23.3)	09 (45)	0.57
Less knowledge about oral hygiene in public/private schools	18 (78.3)	17 (58.6)	14 (70)	01 (4.3)	08 (27.6)	04 (20)	04 (17.3)	04 (13.7)	02 (10)	0.28
Prioritizing oral health care based on socioeconomic factors	02 (8.7)	08 (26.6)	04 (20)	02 (8.7)	03 (10)	05 (25)	19 (82.6)	19 (63.3)	11 (55)	0.19
Motivation to improve practice after witnessing oral health disparities	19 (82.6)	27 (90)	17 (85)	01 (4.3)	03 (10)	03 (15)	03 (13)	0	0	0.096
Socioeconomic & cultural factors										
Cultural	08 (34.8)	15 (50)	09 (45)	08 (34.8)	09 (30)	06 (30)	07 (30.4)	06 (20)	05 (25)	0.85
Religious	05 (21.7)	13 (43.3)	07 (36.8)	04 (17.4)	09 (30)	03 (15.8)	14 (60.8)	08 (26.7)	09 (47.4)	0.14
Immigration	05 (47.8)	39 (53.4)	30 (40)	06 (26.1)	08 (26.7)	11 (50)	06 (26.1)	06 (20)	01 (5)	0.15
Quality of education in public versus private schools	19 (82.6)	21 (70)	12 (60)	03 (13)	05 (16.7)	03 (15)	01 (4.3)	04 (13.3	05 (25)	0.38
Disparities are more evident in public institutions	16 (69.6)	15 (50)	09 (45)	06 (26.1)	11 (36.7)	05 (25)	01 (4.3)	04 (13.3)	06 (30)	0.14
Students' recommendations for dental curriculum modifications										
School visit's role	20 (91.3)	24 (80)	17 (85)	01 (4.3)	05 (16.7)	02 (10)	01 (4.3)	01 (3.3)	01 (5)	0.72
Increase in community placements of undergraduate dental students	20 (87)	26 (86.7)	18 (90)	03 (13)	02 (6.7)	02 (10)	0	02 (6.7)	0	0.49
Understanding oral health disparities through community visits	22 (95.6)	24 (90)	17 (85)	01 (4.3)	04 (13.3)	02 (10)	0	02 (6.7)	01 (5)	0.57
Free Dental camps in undergraduate dental education	19 (86.3)	28 (93.3)	18 (90)	01 (4.5)	01 (3.3)	01 (5)	02 (9.1)	01 (3.3)	01 (5)	0.92
Provision of community oral healthcare versus mere knowledge	18 (78.3)	23 (76.7)	17 (85)	04 (17.4)	03 (10)	03 (15)	01 (4.3)	04 (13.3)	0	0.39

*Chi-square test was applied. *p<0.05 was taken as statistically significant*

Students' recommendations for dental curriculum modifications

Dental students across second, third, and fourth years demonstrated strong and consistent support for incorporating community-based experiences into the undergraduate curriculum, but this response was not statistically significant ($p>0.05$ for all items). A notably high percentage of students agreed that school visits are valuable in dental education, over 81% across all years. Similarly, among all the years 85% and 87% supported increased community placements and participation in free dental camps respectively. Furthermore, over 83% agreed that community visits enhance understanding of oral health disparities, and 77% preferred active provision of community oral healthcare over passive knowledge acquisition (Table: 3).

DISCUSSION

Students gain direct exposure to diverse populations by participating in school visits, strengthening their cultural competence and improving their patient care abilities. The present study was conducted to evaluate the impact of community dental visits on undergraduate dental students' awareness, understanding, and attitudes toward oral health disparities in underserved populations. Most of the dental students agreed on the lack of oral health prioritization in primary healthcare. Undergraduate students recommend increasing the integration of community-based dental education in BDS. Across all years, most of the participants reported heightened motivation to address dental health disparities following community visits.

Community-based programs are vital tools in teaching skills like the cultural, economic & social determinants of health. However, the value of community programs in dentistry is still unclear in most parts of the world, including Pakistan.[12]

Oral health disparities were closely tied to socioeconomic status and more evident in public institutions, reinforcing students' shared concern over the lack of prioritization of dental healthcare. Differences in education quality between public and private schools were also noted, particularly by 2nd-year students who had recently undergone community school visits. These experiences shaped perspectives on intervention strategies, with younger students advocating for school visits and community placements, while senior students emphasized free dental camps and broader outreach initiatives.[13]

Pakistan, a low-middle-income country, has an unstructured primary healthcare system with little to no provision for oral healthcare and a prevalence of 50-70% of dental caries, exacerbated by a community-dentistry program that lacks cultural competence and inadequate public health policy.[14,15] The present study identified similar findings among dental students. Previous studies reported a disparity in the quality of oral healthcare information provided to children in private and public sector schools.[16,17] The students also rendered community visits, community dental hospital/clinics placements, and dental camps integral to undergraduate training. This is in line with a study conducted in Qatar, which emphasized the integration of community dental education in undergraduate curricula to ensure teaching community dental health principles.[18] In the present study, these observations differed slightly across the years of student training, with the main emphasis on more extended community placements compared to shorter medical camps. This was also reflected in studies in Iran and Karachi, on the importance of flexible & adaptable community-based dental education.[19]

The students agreed on the impact of socioeconomic status affecting dental practices, as evidenced by the differences between public and private schools. The profound effect of attending a private school is that it provides a better opportunity to access quality primary oral care, as identified by the scoping reviews.[20,21] The inclusion of cultural competency and the need to address cultural diversity in the undergraduate dental curriculum were other critical factors, especially in developing countries like Pakistan. In a study by Chuenjitwongsa a comparison was drawn between Western and Eastern cultural influences, with Western being more student-centered and Eastern being more passive learners.[22] With the recent changes in dental curricula, the importance of applied community-based dentistry is emphasized,[23,24] it has also been reported in the present study.

Students in the present study pointed out the role of dental curricula in providing the proper knowledge and skills to reduce dental health disparities. They favored the inclusion of community visits, community placements, and dental camps in later years of the undergraduate dental curriculum rather than confining it to the 2nd year BDS.

This study highlighted the critical role of community-based dental visits in enhancing the understanding of oral health disparities of dental students. A structured integration of school visits, clinical placements, public outreach initiatives, and a strong emphasis on cultural competence can significantly contribute to a more community-responsive dental curriculum. Embedding cultural awareness training within these experiences will better equip future qualified dentists to address diverse patient needs effectively.

CONCLUSION

Community placements, school visits, restructuring dental curricula, cultural competency awareness, and the role of primary oral health are essential components for understanding oral health disparities. Community dental visits are an effective educational strategy for enhancing undergraduate dental students' awareness and understanding of oral health disparities. Increasing their frequency may further strengthen students' attitudes toward addressing these disparities in underserved communities.

Limitations of study and future recommendations

It was a single-centre study in an urban setting, which may be enhanced by adding colleges in a more rural environment with stronger community outreach programs. Input from other stakeholders, such as faculty and patients' perceptions, was not taken due to a shortage of time. Larger surveys may be required to gain an adequate insight into the effectiveness of dental visits in addressing oral health disparities. Future research should explore multi-institutional approaches to validate these findings and develop a standardized model for Pakistan's culturally competent community dental education.

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AUTHOR'S CONTRIBUTIONS:

- **AEI:** Conception of study, study design, data acquisition, manuscript drafting
- **MS:** Data collection and manuscript drafting
- **ZH:** Conception of study, data analysis, critical review
- **AQ:** Interpretation of data, manuscript drafting, critical review
- **HS:** Data collection, interpretation of data, manuscript drafting
- **SA:** Design of work, interpretation of data for the work, and review it critically for important intellectual content

All authors approved the final version to be published and agreed to be accountable for all aspects of the work, ensuring that any questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

CONFLICT OF INTEREST:

None

GRANT SUPPORT AND FINANCIAL DISCLOSURE:

Authors declared no specific grant for this research from any funding agency in the public, commercial or non-profit sectors

DATA SHARING STATEMENT:

The data are available from the corresponding author upon request.