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# Factors affecting access to dental care among people treatment - An experience from a tertiary care hospital in Lahore

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## ABSTRACT

**Background and Objective:** Access to oral healthcare is vital for overall well-being, yet it is influenced by a complex interplay of social, cultural, economic, structural, and geographic factors. This study aimed to identify and analyze the socio-demographic characteristics and attitudes affecting access to dental care among residents of the Sheikh Zayed Hospital residential colony in Lahore, Pakistan.

**Methods:** A cross-sectional survey was conducted using a mixed-methods approach, incorporating both qualitative and quantitative data collection techniques. A questionnaire based on Andersen and Aday's behavioral model of healthcare service use was developed and pretested through cognitive interviews to ensure clarity and relevance. Convenience sampling was employed to select 125 participants from the residential colony. Data collection involved door-to-door household surveys, demographic information gathering, and questionnaire responses. Statistical analysis was performed using Statistical Package for the Social Sciences, focusing on descriptive statistics for categorical variables.

**Results:** The study included 125 respondents, with a majority being female (70.4%) and a mean age of 38.98 years. Educational attainment varied, with 6.4% uneducated, 44% having less than 12 years of education, and 49.6% with more than 12 years. Most respondents (61.6%) had a monthly income of ≤ 40,000 Pakistani rupees. Perceived oral health was reported as good by 53.6%. Brushing twice or more daily was practiced by 57.6% of participants. Although 90.4% preferred dental care, only 52.8% had visited a dentist in the past year. Key barriers to accessing dental care included work overload (43.2%), the time for dentist availability (85.6%), dependency on family members (28%), dental anxiety (19.2%), and dissatisfaction with service quality (17.6%).

**Conclusion:** Despite free dental services, psycho-social barriers limit access to care in the study population. Improving clinic availability, extending hours, and enhancing service quality could increase utilization and improve oral health outcomes.

**Keywords:** Dental care, Oral health, Barriers, Socio-demographics, Free dental services.

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## Introduction

Access to oral healthcare is not only important for the maintenance of dental health but also plays a major role in overall health and well-being. Oral diseases such as dental caries and periodontal disease affect not only the oral cavity but also have a profound impact on the entire body. Clear linkages have been documented between these oral diseases and systemic conditions such as respiratory disease, diabetes, and cardiovascular disease. The consequences of inadequate access to dental care are complex and far-reaching, often resulting in poor oral health and adverse health outcomes<sup>1,2</sup>.

Disparities in oral healthcare are stark; dental caries and periodontal disease disproportionately affect vulnerable and underserved populations. The problem of access to oral care is multifactorial, influenced by social, cultural, economic, structural, and geographic factors. For example, limited dental coverage and a lack of oral health literacy contribute significantly to poor access<sup>3</sup>.

Individuals who receive oral healthcare benefit from preventive and educational services, early detection of disease, and restorative care. In contrast, lack of access to dental services is associated with higher morbidity and mortality due to delayed diagnoses and untreated

conditions<sup>4</sup>. Importantly, limited access to dental care affects not only underprivileged and underserved populations but also the affluent segments of both developing and developed countries. As a result, millions of people worldwide have unmet oral health needs<sup>5,6</sup>.

Poor oral health literacy contributes to limited understanding of oral diseases and the importance of seeking timely dental care<sup>7</sup>. Although the issue of access to dental care affects all population groups, certain groups bear a higher burden of disease and unmet need. These include children and teenagers, pregnant women, the elderly, individuals with special healthcare needs and disabilities, populations of lower socioeconomic status, and racial and ethnic minorities<sup>5</sup>. In Pakistan, oral health has historically received low priority within healthcare services, resulting in significant unmet dental treatment needs and limited access to care<sup>8</sup>. In many public healthcare settings, basic restorative dental services are offered free of cost to selective groups.

This unique setting presents an ideal opportunity to examine other factors affecting access to dental care, such as socio-demographics, oral health knowledge, attitudes, and practices. While existing literature highlights the link between oral diseases and systemic health, and documents disparities in dental care access across various populations, limited research has been conducted in environments where services are freely available and geographic access is not a constraint, particularly in Pakistan.

Most studies to date have focused on economic, geographic, and structural barriers, while fewer have explored the roles of socio-demographic characteristics, oral health literacy, and cultural attitudes in influencing access. Therefore, this study was designed to investigate factors beyond geographic proximity, specifically socio-demographic variables, knowledge, attitudes, and practices that influence access to dental care.

By focusing on a population within a controlled environment where dental services are free and easily accessible, this research aims to identify key barriers and facilitators of oral healthcare utilization and to highlight gaps in current approaches to ensuring equitable access to dental services.

## Methods

The research was a cross-sectional survey, designed using both qualitative and quantitative methods for causal comparison. A literature review was conducted to develop the instruments for data collection. These instruments included a questionnaire and clinical examination using the Decayed, Missing, and Filled Teeth (DMFT) Index.

The questionnaire was developed using the Behavioral Model of Healthcare Service Use proposed by Andersen

and Aday<sup>9</sup>. This model not only guided the development of the survey instrument but also supported data analysis and the identification and selection of relevant variables. The questionnaire included sections covering demographic information, knowledge, attitudes, and practices, dental care-seeking behavior, and barriers affecting access to dental care. Before conducting the main survey, the questionnaire was pretested through cognitive interviews in a pilot study. In one-on-one sessions with 15 respondents from the target population but not included further in the study, a trained interviewer read the questions aloud and recorded the participants' explanations or interpretations of each question and their answers. Errors and issues identified during this process were corrected, and necessary changes were made to improve the clarity of the questionnaire. The sample size of 125 residents was estimated by using the following

formula  $n = \frac{Z^2 p(1-p)}{m^2}$ , with a 95% confidence level and a

5% level of significance. A door-to-door household survey was carried out at the residential colony of Sheikh Zayed Hospital, Lahore, Pakistan, and data were collected based on the questionnaire responses taken from 125 residents, each from a different or separate residence. The survey included demographic data, completion of the questionnaire, and clinical examination for DMFT, bleeding gums, and calculus. The inclusion criteria were residents of the Sheikh Zayed Hospital Residential Colony (verified by colony card) living there for more than 6 months and who were entitled to free dental treatment, age 18 years and above, with no known acute or chronic illness, and able to communicate in Urdu or English and complete survey requirements. Exclusion criteria included mentally or physically challenged individuals and those with chronic debilitating illnesses or unfit according to DMFT criteria.

All participants gave a written informed consent, and the study was approved by the Institutional Ethical Review Board of Sheikh Zayed Hospital, Lahore.

## Statistical analysis

Data were analyzed using Statistical Package for the Social Sciences (version 20). Continuous variables such as age and DMFT scores were summarized as means  $\pm$  standard deviation (SD), while categorical variables, including income (three strata), educational status, oral-hygiene maintenance, and so on, were presented as frequencies and percentages. Group differences were assessed using chi-square tests for categorical variables and *t*-tests. Statistical significance was set at  $p < 0.05$  (two-sided).

## Results

Data were collected from 125 subjects. The majority of respondents were females (70.4%), while male participants

comprised 29.6%. The mean age ( $\pm$ SD) of respondents was  $38.98 \pm 11.04$  years. It was found that the majority (44%) of subjects had less than 12 years of education. Respondents' income was categorized into two groups: 61.6% reported earning 40,000 Pakistani rupees or less per month, while 53.6% perceived their oral health as good, and 13.6% rated it as neither good nor bad (Table 1).

In terms of oral hygiene practices, 57.6% reported brushing twice or more daily. Toothbrush usage was reported by 94.4% of participants, while 2.4% used miswak and 3.2% used tooth powder. A preference for dental care was expressed by 90.4%. Dental visits during the past year were reported by 52.8% of respondents, and 13.6% had never visited a dentist. Among all participants, 63.2% sought dental care for pain or trauma, whereas only 11.2% went for a routine checkup (Table 2).

Of the respondents, 78.4% reported no difficulty during their past dental visits. Satisfaction with communication in the dental clinics was reported by 76.8% (0.036). Awareness of entitlement to free dental treatment was reported by 77.6% of respondents. Among the participants, 21.6% were unable to receive dental care because they were dependent on their husbands, and 6.4% due to dependence on other family members. However, 72% reported no dependency on others to visit a dentist. Regarding cultural or religious barriers, only 2.4% stated that these factors limited their access to dental care. Work overload during the day prevented 43.2% of respondents from seeking dental care. The association between dental care and most variables observed was statistically significant (Table 3).

Only 4.8% reported indirect costs, such as loss of income due to missed work, as a barrier to care, while 85.6% indicated that they had difficulty accessing dental care before 2 PM and therefore needed services available after 2 PM. Conversely, 14.4% reported no need for dental services after that time. Regarding satisfaction with dental services, 74.4%

reported no issues. However, 5.6% raised concerns about improper sterilization, 2.4% noted overcrowding, and 17.6% felt that only junior doctors were available. Dental anxiety or fear prevented 19.2% of respondents from receiving care. Access to dental care was evaluated based on treatment-seeking behavior. It was found that 36% received routine treatment, 20% received emergency care, and 44% did not seek any form of dental treatment (Table 3).

## Discussion

Access to oral healthcare is a complex issue, particularly in the developing world, where the poor make the least use of effective interventions<sup>10</sup>. In fact, the first stylized fact about this issue is the underutilization of services, and the second is that utilization is lowest among the poor. This scenario raises critical concerns regarding the efficiency and equity of healthcare services provided. Currently, the concept of

**Table 2.** Knowledge, attitudes, and practices related to oral health among study participants.

Variables		n (%)
Perceived oral health	Good	67 (53.6%)
	Bad	41 (32.8%)
	Neither good nor bad	17 (13.6%)
Brushing frequency	Twice or more daily	72 (57.6%)
	Once daily	53 (42.4%)
Tooth cleaning method	Tooth brush	118 (94.4%)
	Miswak	3 (2.4%)
	Tooth powder	4 (3.2%)
Preferred treatment for dental problems	Dental care	113 (90.4%)
	Other	12 (9.6%)
Last dental visit	Past year	66 (52.8%)
	1-5 years ago	42 (33.6%)
	Never	17 (13.6%)
Private dentist visit	Yes	31 (25%)
	No	94 (75%)
Reason for visiting dentist	Tooth pain/trauma	79 (63.2%)
	Regular visit	14 (11.2%)
	Cavity	8 (6.4%)
	Stains removal	7 (5.6%)
Preferred treatment for dental problems	Dental care	113 (90.4%)
	Other	12 (9.6%)
Last dental visit	Past year	66 (52.8%)
	1-5 years ago	42 (33.6%)
	Never	17 (13.6%)
Private dentist visit	Yes	31 (25%)
	No	94 (75%)
Reason for visiting dentist	Tooth pain/trauma	79 (63.2%)
	Regular Visit	14 (11.2%)

**Table 1.** Socio-demographic characteristics of study participants.

Variables		n (%)
Gender	Male	88 (70.4%)
	Female	37 (29.6%)
Age (Mean $\pm$ SD years)		38.98 years $\pm$ 11.04
Educational status	Uneducated	8 (6.4%)
	Less than secondary education	55 (44%)
	More than secondary education	62 (49.6%)
Monthly income	$\leq$ 40,000	77 (61.6%)
	>40,000	48 (38.4%)

**Table 3.** Factors affecting access to dental care among study participants.

Variables		n (%)	p-value
Difficulty during past visit	Yes	10 (8%)	0.2191
	No	98 (78.4%)	
	Not sure	17 (13.6%)	
Satisfaction with communication	Highly satisfied	96 (76.8%)	0.036
	Partly satisfied	5 (4%)	
	Not satisfied	7 (5.6%)	
Knowledge of free dental treatment	Yes	97 (77.6%)	0.012
	No	28 (22.4%)	
Dependency on others to visit dentist	Dependent (on husband, Brothers, parents and family persons)	35 (28%)	0.089
	Not dependent	90 (72%)	
Cultural/Religious barriers to dental care	Yes	3 (2.4%)	0.342
	No	122 (97.6%)	
Work overload preventing dental care	Yes	54 (43.2%)	0.813
	No	71 (56.8%)	
Indirect cost to dental care	Yes	6 (4.8%)	0.686
	No	119 (95.2%)	
Need for dentist availability after 2 PM	Yes	107 (85.6%)	0.512
	No	18 (14.4%)	
Problems with dental department services	No problem	93 (74.4%)	0.011
	Sterilization issue	7 (5.6%)	
	Crowded	3 (2.4%)	
	Only junior doctors available	22 (17.6%)	
Dental anxiety	Yes	24 (19.2%)	0.019
	No	92 (73.6%)	
	Sometimes	9 (7.2%)	
Treatment seeking behavior	Routine treatment	45 (36%)	0.0037
	Emergency treatment	25 (20%)	
	No treatment	55 (44%)	

p-value < 0.05 is taken as significant.

access goes beyond availability to include patient-based factors such as perceived need for care, cultural preferences, and language. These factors directly influence the demand for dental care, independent of its availability. Therefore, when considering access to dental care, it is essential to address both the availability of services and the patient's willingness to seek care. Issues of access in relation to coverage and affordability in healthcare are well documented<sup>11</sup>.

Identifying internal barriers can support the development of policies that better integrate preventive and treatment services, along with health promotion activities, to increase demand for oral healthcare. The present study explored these patient-based factors among a population residing within hospital premises and entitled to free dental care. Our study was grounded in the Andersen and Newman<sup>12</sup>

model, which proposes that an individual's access to and utilization of health services is influenced by three categories: predisposing factors, enabling resources, and need factors<sup>12</sup>. This framework is simple yet realistic, as these population characteristics interact to shape health behaviors, including personal practices and healthcare utilization. In this study, we integrated knowledge, attitudes, and practices with perceived need and socio-demographic factors to analyze their combined effect on access to dental care. Treatment-seeking behavior (treatment sought vs. not sought) was used as a proxy for access. Multiple factors were found to influence dental care access. More than half of the respondents reported seeking dental treatment only in cases of pain or emergency, rather than for regular check-ups. Even when experiencing pain, many preferred emergency care over

routine follow-up. This indicates that toothache is a strong predictor of dental visits and often drives patients toward emergency care, regardless of age, gender, or education level. Similar findings were reported in a Nigerian study, which concluded that irregular dental attendance is attributable to poor perception of dental needs or the absence of pain<sup>13</sup>. In our study, perceived oral health status was not significantly associated with treatment-seeking behavior. However, 63.2% of participants still visited a dentist only due to pain, despite having access to free dental services. This further underscores a general lack of concern for preventive oral health.

An interesting finding was that many participants cited work overload during the day as a barrier to accessing care, since dental services at the hospital are available only until 2 PM. Yet, those who considered work overload a barrier were more likely to seek regular treatment compared to those who did not cite it as a barrier. This contrasts with a study from USA, which found that work overload tends to reduce dental attendance and preventive visits<sup>14</sup>. Dental anxiety, a known barrier to dental care, was also reported by many participants - particularly among females. Prior studies support this finding, documenting that dental anxiety significantly impacts care utilization and access-related behaviors<sup>5,15</sup>. The findings indicate that awareness of free dental services, satisfaction with provider communication, and cultural or logistical facilitators play a decisive role in shaping care-seeking behavior, whereas work-related constraints appear less influential. These patterns suggest that improving patient education, reinforcing trust in service quality, and addressing context-specific barriers may yield greater impact than expanding service hours alone. Overall, utilization of dental care in this setting seems to be driven more by perceptions and socio-demographic factors than by geographic accessibility.

### Limitations of the study

This study has a few limitations that should be considered. First, the research was conducted within a specific group of people living in a hospital residential colony, so the findings may not apply to other populations. Second, because the data were collected through self-reports, there is a chance that participants may not have been entirely accurate in describing their behaviors or attitudes. Additionally, the study didn't fully address cultural or language barriers that might affect access to dental care. Since the study is cross-sectional, it only gives a snapshot of the situation at one point in time, meaning we cannot make conclusions about cause and effect. Finally, while we focused on socio-demographic factors, knowledge, and attitudes, we didn't explore other factors, such as psychological issues or broader healthcare

system problems, that may also influence access to dental care.

### Conclusion

The study reveals that while most respondents are aware of their oral health and prefer dental care, barriers such as work overload, limited clinic hours, and dependency on family members hinder access. Additionally, dental anxiety and dissatisfaction with the quality of services also contribute to reduced treatment-seeking behavior. Improving clinic availability and addressing these barriers could enhance access to dental care.

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### List of Abbreviations

DMFT	Decayed, Missing, and Filled Teeth Index
IRB	Institutional Review Board
SPSS	Statistical Package for the Social Sciences
PKR	Pakistani Rupee
SD	Standard Deviation

### Conflict of interest

None to declare.

### Grant support and Financial disclosure

None to disclose.

### Ethical approval

The ethical approval of the study was obtained from the Institutional Review Board of the Federal Postgraduate Medical Institute, National Health Research Complex, Sheikh Zayed Hospital, Lahore vide Reference: F-38/NHRC/1102B/310 dated: 09-08-2022.

### Authors' contributions

**MMK, AAK:** Concept & design of study, data collection, critical intellectual input, drafting of manuscript

**FAQ, ER, AK:** Drafting of manuscript, critical intellectual input, acquisition and analysis of data

**ALL AUTHORS:** Approval and responsibility of the final version of the manuscript to be published. .

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## References

1. Crocombe LA, Chrisopoulos S, Kapellas K, Brennan D, Luzzi L, Khan S. Access to dental care barriers and poor clinical oral health in Australian regional populations. *Australian Dental J*. 2022;67(4):344–51. <https://doi.org/10.1111/adj.12938>
2. Erwin J, Horrell J, Wheat H, Axford N, Burns L, Booth J, et al. Access to dental care for children and young people in care and care leavers: a global scoping review. *Dentist J*. 2024;12(2):37. <https://doi.org/10.3390/dj12020037>
3. Thomas M, Tillman P, Buelow J. The role of social determinants in health care: student reflections on patient needs, community resources, and interprofessional development. *Health, Interprofessional Pract and Educ*. 2020;4(1):2113–17. <https://doi.org/10.7710/2641-1148.2113>
4. Peres MA, Macpherson LM, Weyant RJ, Daly B, Venturelli R, Mathur MR, et al. Oral diseases: a global public health challenge. *Lancet*. 2019;394(10194):249–60. [https://doi.org/10.1016/S0140-6736\(19\)31146-8](https://doi.org/10.1016/S0140-6736(19)31146-8)
5. Northridge ME, Kumar A, Kaur R. Disparities in access to oral health care. *Ann Rev Public Health*. 2020;41:513–35. <https://doi.org/10.1146/annurev-publhealth-040119-094318>
6. Dutra LD, de Lima LC, Neves ÉT, Gomes MC, de Araújo LJ, Forte FD, et al. Adolescents with worse levels of oral health literacy have more cavitated carious lesions. *PLoS One*. 2019;14(11):e0225176. <https://doi.org/10.1371/journal.pone.0225176>
7. Das D, Menon I, Gupta R, Arora V, Ashraf A, Ahsan I. Oral health literacy: a practical strategy towards better oral health status among adult population of Ghaziabad district. *J Fam Med Prim Care*. 2020;9(2):764–70. [https://doi.org/10.4103/jfmpc.jfmpc\\_1043\\_19](https://doi.org/10.4103/jfmpc.jfmpc_1043_19)
8. Jawaid SA. Plight of dentistry in Pakistan. *Pakistan J Med Sci*. 2020;36(3):299. <https://doi.org/10.12669/pjms.36.3.2292>
9. Andersen R, Aday LA. Access to medical care in the US: realized and potential. *Med Care*. 1978;16(7):533–46. <https://doi.org/10.1097/00005650-197807000-00001>
10. Kandelman D, Arpin S, Baez RJ, Baehni PC, Petersen PE. Oral health care systems in developing and developed countries. *Periodontology*. 2000. 2012;60(1):98–109. <https://doi.org/10.1111/j.1600-0757.2011.00427.x>
11. Buchmueller TC, Levy HG. The ACA's impact on racial and ethnic disparities in health insurance coverage and access to care. *Health Affairs*. 2020;39(3):395–402. <https://doi.org/10.1377/hlthaff.2019.01394>
12. Andersen R, Newman JF. Societal and individual determinants of medical care utilization in the United States. *Milbank Mem Fund Q Health Soc*. 1973;51(1):95–124. <https://doi.org/10.2307/3349613>
13. Olajide M, Babalogbon S, Ladeji A M, Fasasi O, Abah A, Akinleye A. Pattern and distribution of patients' dental attendance in a Nigerian Tertiary Centre. *Saudi J Oral Dent Res*. 2021;6(6):251–60.
14. Wang TT, Mehta H, Myers D, Uberoi V. Applying behavioral economics to reduce broken dental appointments. *J Am Dent Assoc*. 2021;152(1):3–7. <https://doi.org/10.1016/j.adaj.2020.10.010>
15. Milgrom P, Newton JT, Boyle C, Heaton LJ, Donaldson N. The effects of dental anxiety and irregular attendance on referral for dental treatment under sedation within the National Health Service in London. *Community Dent Oral Epidemiol*. 2010;38(5):453–9. <https://doi.org/10.1111/j.1600-0528.2010.00552.x>