BMC Oral Health

Assessment of treatment needs, barriers, and self-perception regarding oral health among female university students: a cross-sectional study

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Abstract

Background The study aimed to compare the self-perceived oral health status measured through a self-administered questionnaire with clinically determined oral health status measured by decayed-missing-filled teeth (DMFT) and community periodontal index of treatment need (CPITN) indices in university going females. In addition, access barriers to treatment related to oral healthcare were also determined.

Methods A 3-month analytical cross-sectional study was designed for consenting university going females (aged 18–22 years) in Islamabad, Pakistan. The self-perceived oral health was recorded through a questionnaire requesting information regarding socio-demographics, self-perception of oral health, frequency of dental visits and barriers to seeking oral health. Seven independent examiners performed intraoral clinical examination and assessed the oral health status using globally standardized oral health assessment indices (DMFT and CPITN).

Results A total of 400 students were included in the final sample. The study revealed a significant disparity between self-perceived oral health and clinical assessment. Although perceived oral health was considered "good" by 80.0% of the respondents, clinical examination revealed moderate DMFT scores (mean 2.95 ± 1.41) and periodontal disease requiring treatment in 89.5% of the individuals. The most common barriers in seeking dental care were lack of knowledge, dental phobia, affordability issue and false self-perception.

Conclusion The present study demonstrated a notable discrepancy between self-perception of oral health and clinically assessed oral health. These results emphasize the importance of focused educational programs and community outreach programs, especially directed towards this demographic. Prioritizing such initiatives will help individuals to recognize their actual oral health condition thus encouraging positive oral health behaviors and outcomes.

Keywords CPITN, Oral health, Self perception, Treatment needs, Oral health barriers

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Introduction

According to the World Health Organization (WHO), oral health is a significant part of a person's general health and is vital to maintain the quality of life. Good oral health boost an individual's confidence to participate in society and thus achieve their potential [1]. Common non-communicable infectious oral diseases such as dental caries, gingivitis and periodontitis are highly prevalent in South-East Asia. According to estimates from 2019, over 900 million cases of untreated dental caries; severe periodontal diseases; and edentulism were recorded in the region [2]. According to the global burden of disease study, tooth decay affects about 3.1 billion people in the world and is one of the most common unmet health needs. It is estimated that 52% of tooth decay in high-income communities and 100% of tooth decay in low-income communities remain untreated [3, 4]. The prevalence of dental caries in Pakistan is estimated at 60%. This remains uniform across the 4 provinces. The prevalence of periodontitis is documented at 37% in Punjab; 40% in Sindh; 20% in Khyber Pakhtunkhwa; and 3% in Baluchistan [5]. Neglect of oral health is a common phenomenon in Pakistan, especially by Pakistani women, who are less likely to seek dental care than their male couter parts [5–7]. This is despite oral health care being considered an integral part of the primary health care system. Studies show that oral health neglect is influenced by gender, ethnicity, access to care, time constraints, dental anxiety and lack of awareness in both the patients and the health system decision-makers [6, 7].

In addition, self-perception of oral health is an important determinant of whether an individual will utilize the available oral health services. This perception is affected by various factors including gender, educational level, personal experiences, hygiene habits, general health, and oral health consciousness [8–10]. However, self-perception of oral health is a subjective measure, which may not always be a true representation of the actual oral health as determined by clinical assessment of teeth, gums, oral tissues, and oral hygiene practices [11, 12].

Aware patients are more likely to engage in healthy oral hygiene habits and seek appropriate dental care timely [9]. Such proactive behaviour consisting of regular dental visits and good oral hygiene practices (such as regular brushing and flossing) are important for maintaining overall well-being. According to a study, dental students had a worse self-perception of oral health compared to engineering students. Additionally, nursing students who flossed and brushed regularly were more likely to seek dental care than their counterparts who did not. [13, 14]. Furthermore, women generally demonstrate a poorer self-perception of oral health, and a higher education level is associated with an inferior self-perception of oral health. [8, 10]. Given that awareness of oral hygiene and education determinants are important factors in self-perception of oral hygiene, we chose to sample university students in an urban city that has students from diverse socioeconomic backgrounds. The purpose of this investigation was to determine self-perceived oral health of university going female students (age 18–22) using a questionnaire and compare it with clinically determined oral health status measured by decayed-missing-filled teeth (DMFT) and community periodontal index of treatment need (CPITN) indices. In addition, access barriers to treatment related to oral health were also determined.

Methods

Ethical approval

Ethical approval was received from the institutional review board at Riphah International University, Pakistan prior to proceeding with the study.

Study design

An analytical cross-sectional study design was used to recruit university going females between the ages of 18 and 22 years in urban Islamabad, Pakistan during a period of 3 month (March 2023 to May 2023).

Sample size and study participants

The sample size was estimated using the WHO calculator with 5% confidence interval and 95% confidence level [15]. A list of female students enrolled in the 1st semester of two universities in Islamabad was taken from their respective admission offices. A total of 450 female students were invited to participate in the study through text messages. Participation was entirely voluntary and not a requirement of the course curriculum. The students enrolled in all disciplines offered in the university were approached. These included computer sciences, social sciences, humanities and biological sciences. The students were excluded if they failed to provide written consent, were absent on the day of the oral health examination, or did not fit into the specified age criterion of 18 to 22 years. This left a total of 400 students.

Data collection procedure

Training of examiners

As a part of the dental public health initiative of Riphah International University, seven qualified dentists screened the participants. The examiners were trained for greeting, taking consent, remaining neutral and polite, performing clinical oral examination, and probing techniques. Examiners were also familiarized with the questionnaire and data collection software (Kobo Toolbox-Harvard Humanitarian Initiative) [16]. Training on ethical consideration of research included procedure to take informed consent, issues of

confidentiality of data and privacy of individuals was also done.

Research instrument

A unique questionnaire was developed after detailed literature search (Study questionnaire: Supplementary file attached). One week before the clinical examination, a self-administered questionnaire entered into Kobo tool software was distributed to the participants. Data collection occurred within the computer labs of the respective universities, where Kobo software was integrated into the lab computers. Each form required approximately 20 min for completion. The self-administered questionnaire comprised of three sections that included information about sociodemographic factors, self-perception of oral health, frequency of dental visits, and finally barriers to treatment related to oral health. Since self-perceived oral health status is a latent construct, participants' subjective opinion was registered on a 5-item Likert scale: excellent, very good, good, poor, very poor option. Self-assessed bleeding and periodontal health were also assessed using simple yes and no questions.

Pretesting

The questionnaire was pre-tested on 5% of the sample. Respondents were briefed about the study and written consent was taken. The data were collected in the computer labs of the respective universities during university operating hours. Reliability testing on this pilot data rendered Cronbach alpha of 0.95.

Clinical examination

For the clinical examination, a globally standardized oral health assessment form developed by WHO was used to assess the oral health status. After the examiners obtained the written informed consent, clinical examinations of the participants were conducted in well-lighted areas. The participants were examined whilst seated on a chair using a torchlight and a plain dental mirror, a WHO periodontal probe, and disposable gauze. No radiographs were obtained in this study to diagnose caries lesions.

Inter examiner reproducibility

The findings of the examiners were unknown to each other. To establish inter-examiner reproducibility, two benchmark examiners re-examined 10% of the sample. The examiners were trained to bring their diagnostic standards as close as possible. Both were compared to the reference examiner (principal investigator) to perform calibration. The re-examination was performed by the benchmark examiners after every 10th student. The WHO guidelines were used to diagnose dental caries by the DMFT index and periodontal health by the CPITN index.

Data analysis

Data was entered into the software using the Kobo data collection tool and later exported to Microsoft Excel v 2016. The data quality check was made to identify any missing values and eliminate errors and duplications. Statistical analysis was performed using SPSS software v 26.0 (SPSS Inc, Chicago, IL, USA). All databases were password-protected to ensure the confidentiality of patient information. A descriptive representation of data regarding sociodemographic, self-perception of oral health, dental visits, and barriers regarding treatments was calculated. Fisher's Exact Test was used to compare self- perception and intervention urgency.

Results

Sociodemographic characteristics

Data was collected from 400 female students. Respondent's age ranged between 18 and 22 years, mean age 19.91 ± 1.22. About 40.5% ($n=162$) of the girls were 19 years or below, while 59.5% ($n=238$) were 20 years or above. Nearly 90.5% ($n=362$) of girls were living at home with their families while 9.5% ($n=30$) were living in university accommodations. A total of 92.5% ($n=379$) were unmarried. Approximately 96% ($n=382$) of the female students were not working. The majority of the females came from educated families, 96.5% ($n=386$) of student's father and 72.5% ($n=290$) of mothers had an education more than secondary school. Only 23.7% ($n=95$) had received formal oral health care knowledge before. These results are summarized in Table 1.

Self-perception of oral health

The self-perceived oral health was categorized as poor, good or excellent. 7.5% ($n=30$) of the participants rated their oral health as poor, 80% ($n=320$) as good, and 12.5% ($n=50$) as excellent. 18% ($n=72$) of the sample thought that they have bad breath, while 7.5% ($n=30$) were unaware about it and 74.5% ($n=298$) thought that they don't have bad breath. 5.5% ($n=96$) had some sort of dryness, or difficulty in swallowing while 94.5% ($n=378$) had never experienced it. 60% ($n=240$) had observed bleeding from their gums while brushing or otherwise. Only 8.7% ($n=35$) believed that they have some gum disease while 72.5% ($n=290$) considered their oral health as normal. These results are summarized in Table 2.

DMFT index

The mean DMFT score for the study population was found to be 2.95 ± 1.41 (range=1 to 18) classified as "moderate" for the whole population.

Table 1 Sociodemographic factors

Variable	Number (n) total sample size 400	Percentage (%)
Age in completed years		
≤19	162	40.5
>19	238	59.5
Currently living		
At home with family	362	90.5
Hostel	38	9.50
Marital status		
Unmarried (not engaged)	379	92.5
Engaged to be married	30	7.50
Part time Job		
Yes	18	4.50
No	382	95.6
Family Education		
Father educated	386	96.5
Mother educated	290	72.5
Have received oral health care knowledge		
Yes	95	23.7
No	307	76.7

Table 2 Self- perception of oral health

Variables	Number (n) total sample size 400	Percentage (%)
Overall how would you rate the health of your teeth and gums?		
Poor	30	7.50
Good	320	80.0
Excellent	50	12.5
Do you think you have bad breath?		
Yes	72	18.0
No	298	74.5
Don't Know	30	7.50
Do you feel dryness in mouth or difficulty in swallowing?		
Yes	22	5.50
No	378	94.5
Did you ever noticed bleeding gums while brushing or otherwise?		
Yes	240	60.0
No	160	40.0
Do you think you might have gum disease?		
Yes	35	8.70
No	290	72.5
May be	75	18.7

Treatment index

The findings of the CPITN are shown in Table 3. Only 10.5% (*n*=42) individuals did not require any treatment, 10% (*n*=40) needed oral hygiene improvement. 35.7%

Table 3 Community periodontal index of treatment needs

Variable	Number (n)	Percentage (%)
No periodontal treatment required	42	10.50
Oral hygiene improvement	40	10.00
Calculus removal and oral hygiene improvement	143	35.70
Complex periodontal treatment and oral hygiene improvement	175	43.75

(*n*=143) needed scaling and deep cleaning, and 43.7% needed complex periodontal treatment and oral hygiene improvement (Table 3).

Intervention urgency and self-perception

Among the individuals who self-rated their oral health as poor (*n*=30), 73.3% (*n*=22) needed immediate treatment, while 26.6%(*n*=8) needed prompt treatment (including scaling).Among them 80% (*n*=320) of participants considered their oral health as good. 45.3% (*n*=145) needed immediate treatment, 32.8% (*n*=105) needed prompt treatment and 10.9% (*n*=35) needed preventive or routine treatment.

Oral health was rated as excellent by a total of 12.5% (*n*=50) participants while 16% (*n*=8) needed immediate treatment due to dental origin pain or infection, 60% (*n*=30) needed prompt treatment due to disease of gum origin, 10% (*n*=5) needed preventive treatment while only14.0% (*n*=7) participants had healthy gums and teeth (Table 4).

Barriers to treatment

Table 5 shows the barriers related to receiving dental treatment. About 57.5% of individuals (*n*=230) reported fear of dental anxiety as a deterrent to seeking dental care while 18.7% of individuals (*n*=75) expected their dental problems would go away on their own. Approximately 13.2% percent (*n*=53) rated affordability as their number one reason for not seeking dental care, while 10.5% (*n*=42) have issues with the working hours of the clinic.

When asked about their perception of visiting the dental clinic; 27.5% (*n*=110) responded that they will look forward to it as an enjoyable experience if they have an idea about the procedures and are aware of what will happen at the clinic, 8.0% (*n*=32) would be uneasy and avoid going to the clinic and 15.0% (*n*=60) wouldn't care one way or other. Approximately 49.5% (*n*=198) answered that they would be frightened because of a lack of control over the procedures.

Discussion

The present study compared the self-perceived oral health status and clinically determined oral health status measured by intraoral examination in female university

Table 4 Intervention urgency and self- perception of participants

Intervention urgency					Total N (%) 400
Self-Perception of Oral Health		No treatment needed N (%)	Preventive or routine treatment needed N (%)	Prompt treatment (including scaling) N (%)	Immediate treatment needed due to pain or infection of dental origin N (%)	
	Poor	0 (0%)	0 (0%)	8 (26.6%)	22 (73.3%)	30 (7.5%)
	Good	35 (10.9%)	35 (10.9%)	105 (32.8%)	145 (45.3%)	320 (80%)
	Excellent	7 (14.0%)	5 (10.0%)	30 (60.0%)	8(16.0%)	50 (12.5%)

Table 5 Barriers to needed dental treatment

Variables	N total sample size 400	%
Reasons for not getting the needed dental care		
Could not afford the cost	53	13.2
The dental office is not open at convenient times	42	10.5
Afraid of going to the dentist	230	57.5
Did not think anything serious was wrong/expected dental problems to go away.	75	18.7
Perception while visiting dental clinic		
Look forward to it as a reasonably enjoyable experience if have an idea of the procedure and process	110	27.5
Would be a little uneasy about it and would avoid going	32	8.0
Wouldn't care one way or other	60	15.0
Would be very frightened of what the dentist might do	198	49.5
Do you think that lack of knowledge about dental issues acted as a barrier to getting the needed treatment?		
Yes	320	80.0
No	80	20.0

students. Furthermore, access barriers to treatment related to oral healthcare were also determined. Our results demonstrated that self-perception of oral hygiene and clinical assessment measured through DMFT and CPITN were not coordinated. Although the majority of our respondents perceived their oral health positively as good, the clinical assessment showed a high DMFT and a high prevalence of periodontal disease with individuals requiring at least some form of oral treatment. Some of the most common barriers to seeking dental care included lack of knowledge, dental phobia, affordability issues, time constraints, lack of control and ideas, and self-perception. Individuals may perceive their oral health to be good if they have no noticeable pain, swelling, bleeding gums, or visible signs of decay. In contrast, a few individuals may be more critical of their oral health, recognizing minor issues that they feel need to be addressed [17].

Prior literature has shown that a person aware of his/her oral condition is more likely to seek clinical dental care and to adhere more firmly to it. Therefore, it is believed that self-perception and clinical condition of oral health are directly proportional [18]. Therefore, it is believed that self-perception and clinical condition of oral health are directly proportional. The majority of our participants were part of the earlier category where the lack of an obvious issue gave them a perception of good oral health although they needed dental intervention according to the clinical parameters set forth by the WHO (CPITN and DMFT). Prior studies have shown similar results where positive self-perception indices were accompanied by poor clinical oral health [19–21]. A study from Brazil showed a limited association between self-perception and clinical oral health [22]. This unrealistic view of one's oral health can be attributed to several factors like lack of oral health awareness and a belief that dentistry is only for esthetic reasons. Individuals unaware of the extent of their oral health problems may underestimate the severity and implications of their issues and therefore believe that their oral health is better than it is [23].

Women tend to have a low perception of oral health [24]. This has been attributed to the level of awareness and psychosocial factors [25, 26]. The number of individuals in our sample reporting bad breath was notably lower compared to findings from previous study [28]. Prior studies show that the prevalence of malodor is comparable in men and women. However, women tend to be more aware about the changes in their oral health when compared to men [27, 28].

Education is directly associated with maintaining oral health. Patients with higher education have been reported to have lower CPITN and DMFT indices [21]. Since our sample population was pursuing a university education, it would explain moderate values for DMFT. However, our high CPITN values would indicate limited awareness about oral health. A prior study has shown that despite awareness, dental students and dental auxiliaries need to be formally educated in oral hygiene measures to ensure compliance [29, 30].

In this study, only one-fifth of our sample population had visited the dentist within the previous 6 months which was significantly less than prior studies [31–34].

According to the theoretical model put forth by Andersen, the barriers to acquiring dental treatment can be multifaceted and broadly classified into psychological, financial, logistical, and information factors [35]. One prominent barrier highlighted by 80% of the individuals in the current study is the lack of oral health awareness. This encompasses a limited understanding of preventive dental care practices and a failure to recognize early signs and symptoms of dental problems [11, 36]. This may cause some individuals to underestimate the urgency of addressing dental issues, leading to delays in seeking treatment and allowing conditions to progress.

Dental anxiety was another significant factor in preventing patients from seeking dental care [37, 38]. This fear may stem from anxiety about the procedures themselves or discomfort with the clinical environment. Addressing these barriers requires efforts to enhance dental health literacy through educational initiatives emphasizing the importance of preventive care, community outreach programs and easily accessible information that ensures individuals have an accurate understanding of the various oral health procedures [38].

The financial cost of dental care may deter individuals from seeking treatment [39]. About one-tenth of our participants reported financial constraints as a deterrent to seeking oral care. Interestingly, a notable percentage of our participants did not perceive their dental issues as serious and expected to resolve them on their own. This perception also reflects a potential lack of oral health awareness.

The findings of this study emphasize the importance of oral health promotion programs targeting the young adult population as it could help to improve their attitude and oral health behaviour leading to positive outcomes. The research has a broader scope of encouraging the development of a healthy institutional environment and culture. While the health sector may lead the overall response to health addressing broad determinants of health and wellbeing requires a multisector approach and action. Since school and university environments can play a vital role in spreading awareness and filling the gaps, we recommend building policies to develop a healthy institutional environment and culture.

Limitations of our study include the absence of a control population for comparison and self-reporting questionnaires.

Conclusion

In conclusion, there are differences between self-perceived oral health and clinical oral health as measured through DMFT and CPITN indices. In addition, lack of awareness, dental anxiety, fear of the unknown, and financial constraints play a role in delaying necessary care. These results emphasize the importance of focused educational programs and community outreach programs for all demographics; even those with university education. By prioritizing such initiatives, we can educate individuals in recognizing features of oral disease thus bridging the gap between perception and reality along with positively influencing oral health behaviors. It will foster a proactive approach that helps prevent the advancement of dental issues, ultimately leading to better overall oral health outcomes.

Supplementary Information

Data availability
Data will be made available by the corresponding author upon reasonable request.

Declarations

Ethics approval and consent to participate
The research protocol was approved by institutional review committee, Riphah International University (Approval no: IIDC/IRC/2020/02/012). Informed consent was obtained from each participant through written consent forms, which clearly outlined the purpose of the study and the rights of the participants. Participation was entirely voluntary and not a requirement of the course curriculum.

Consent for publication
Not applicable.

Competing interests
The authors declare no competing interests.

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