

ORAL HYGIENE PRACTICE AND DENTAL CARIES STATUS AMONG FEMALE MEDICAL STUDENTS RESIDING IN HOSTELS AT KMU-IMS KOHAT: A CROSS-SECTIONAL ANALYSIS

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Abstract

Background: Poor oral hygiene and dental caries are frequently encountered issues yet often neglected, especially among young adults. Medical students in spite of their future roles in healthcare may often adopt unhealthy oral hygiene practices

Objective: The study aimed to determine the oral hygiene status and dental caries prevalence among hostelite female medical students at KMU-IMS, Kohat, KPK, Pakistan, and to identify the associated factors influencing their dental health.

Material and Methods: A cross-sectional study was conducted from April to June 2023 in KMU Institute of Medical Sciences, Kohat. Census sampling was employed, and all 203 eligible female hostelite students were considered for inclusion; 190 students consented to participate. Data were collected using a structured questionnaire and oral examinations. Oral health status was assessed using the Oral Hygiene Index Simplified (OHI-S) and the DMFT (Decayed, Missing, Filled Teeth) index. The examination was conducted by trained researchers under the supervision of dentists. Data were analyzed using SPSS version 22, using descriptive and chi-square test for inferential analysis to assess associations between oral hygiene, caries status, and related factors.

Results: The mean age of the participants was 21.91 ± 1.78 years. The average OHI-S score was 2.11 ± 1.14 , indicating that 118 (62.1%) participants had fair oral hygiene. The mean DMFT score was 0.89 ± 1.35 . Associations between oral hygiene status and related factors were assessed using the chi-square test. Significant factors associated with poor oral hygiene included brushing once a day, lack of use of dental floss or mouthwash, and frequent consumption of carbonated drinks (all $p < 0.001$).

Conclusion: Although the prevalence of dental caries was low, the majority of participants had fair oral hygiene. The findings highlight the need for improved oral health education focused on promoting better habits to enhance overall oral hygiene and prevent dental caries.

Keywords: Oral hygiene, dental caries, OHI-S, DMFT, dental health, female medical students residing in hostels, Pakistan.

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Introduction:

The word "dental caries" describes both the condition and the lesion that develops as a result. The caries process takes place in the biofilm that's always active during pH changes, and a cavitated lesion develops in the hard tissues of the teeth. In recent years, there have been major changes in the treatment of dental caries. Early caries prevention and detection is the cornerstones of the most modern practical strategies.

Additionally, they are predicated on the diagnosis of risk factors and risk indicators¹⁻³. The goal of the new management techniques is to maintain healthy tissue, in line with the ideas of minimally invasive dental treatment⁴. Since dental caries is the most common disease across the world, it poses a serious threat to healthcare. Dental caries affect nearly all adult individuals. Despite being readily preventable,

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the disease is concentrated in poor socioeconomic groups^{5, 6}. Despite being largely avoidable, dental caries is the most common health problem worldwide, affecting over 35% of adults and being the most common among all age groups⁷. Recent global reports further emphasize the growing oral health burden and the need for preventive oral health strategies and universal access to oral healthcare services.^{22, 23}

Dental caries is the outcome of a complicated interaction between personal susceptibility, dental hygiene routines, and dietary habits. Dental plaque, a sticky biofilm made of bacteria that feeds on the carbohydrates in food, is the first step in the process. If treatment is not received, the acids produced by these bacteria's metabolism of sugars may erode tooth enamel, causing demineralization and the eventual development of cavities,⁹. It takes good oral hygiene habits to break this cycle and lower the risk of carries, including flossing, brushing with fluoride toothpaste on a regular basis, and getting frequent dental exams^{10, 11}. Recent studies among students have also demonstrated associations between dietary patterns, lifestyle behaviors, BMI, and oral hygiene practices with oral health outcomes.¹⁸⁻²⁰ Dental caries have societal and economic ramifications that go beyond personal discomfort because they raise healthcare expenses and reduce productivity because of dental-related problems^{12, 13}.

The rationale for studying oral hygiene and dental caries status among female medical students stems from their role as educated and influential members of society, expected to advocate for health promotion, including oral health. Despite their education, unique physiological, social, and behavioral factors may still affect their oral health practices. The Health Belief Model (HBM) provides a useful framework to understand these behaviors, as it explains health-related actions through perceived susceptibility, severity, benefits, barriers, cues to action, and self-efficacy. Examining their habits and caries status highlights potential gaps in knowledge or behavior and offers insights into broader community health implications. This study aims to bridge these gaps through targeted interventions, promoting proactive oral health management among educated women.

Material and Method:

Study Design:

A cross-sectional study was conducted.

Study Setting:

The study was conducted in all female hostels of KMU-IMS Kohat.

Study Duration:

A cross-sectional study was conducted in all female hostels of KMU-IMS, Kohat, from April 2023 to June 2023 after obtaining approval from the KIMS Research Ethics Committee (KIMS-REC/ECC/23/05).

Sampling Technique: Census sampling was employed, and all 203 eligible female hostelite students (obtained from the Students Affairs Section, KIMS, 2022) were considered for inclusion. Out of these, 190 students consented to participate in the study. All female hostelite students willing to participate were included, while those unavailable during the three-month data collection period were excluded from the study.

Inclusion Criteria: After approval from the KIMS Research Cell, the research team visited all female hostels to assess the oral health status of the participants. Informed consent was obtained prior to data collection. A predesigned questionnaire consisting of two parts was used to collect the required information. The first part included demographic details such as age, domicile, and academic year, along with questions regarding oral hygiene practices, including frequency of tooth brushing, use of additional oral cleaning aids such as dental floss and mouthwash, frequency of dental visits, consumption of carbonated drinks, and frequency of toothbrush replacement. The second part assessed oral hygiene and dental caries status using the Oral Hygiene Index Simplified (OHI-S) developed by Greene and Vermillion and the DMFT (Decayed, Missing, Filled Teeth) Index developed by Klein *et al.* Oral examinations were performed using reusable dental mirrors which were sterilized in OT after each use, explorers, dental probes, and clinical pen torches after proper training and demonstration by KIDS dentists. The examinations were conducted under the supervision of dentists from the Community Dentistry Department of KIDS.

Exclusion Criteria: The Oral Hygiene Index was used to assess oral hygiene status and was calculated by summing the debris and calculus indices. Based on the total score, oral hygiene was categorized as excellent (0), good (0.1–1.2), fair (1.3–3), and poor (3.1–6). A missing tooth was defined as a tooth lost due to dental caries, excluding teeth missing for other reasons. A decayed tooth included carious teeth, filled teeth with recurrent decay, or teeth with retained roots only. A filled tooth referred to a tooth that had undergone permanent restoration without secondary caries. The DMFT index was used to calculate the average number of decayed, missing, and filled teeth per participant, thereby quantifying lifetime caries experience in permanent dentition.

DATA ANALYSIS PROCEDURE:

SPSS version 22 was used for data analysis. Descriptive statistics (mean and standard deviation) were calculated for continuous variables such as age, while frequencies and percentages were computed for categorical variables, including debris levels (no debris, soft debris, soft debris covering 2/3rd) Categorized by oral hygiene status (excellent, good, fair, poor), as well as decayed, missing, and filled teeth. The chi-square test was applied to assess

associations between oral hygiene status and brushing frequency, use of dental floss or mouthwash, and consumption of carbonated drinks. A p-value of <0.05 was considered statistically significant.

Results:

The study results revealed that the participants had an average age of 21.91 ± 1.776 years. The Debris Index, which measures plaque levels on teeth, had a mean score of 1.819 ± 1.0366 , while the Calculus Index, indicating tartar buildup, had a mean of 0.286 ± 0.3905 . The Oral Hygiene Index Simplified (OHI-S), which evaluates overall oral hygiene, averaged 2.108 ± 1.1409 . The DMFT (Decayed, Missing, Filled Teeth) score was 0.89 ± 1.349 . Regarding oral hygiene status, 3 (1.6%) of the participants were classified as having excellent hygiene, 40 (21.1%) had good hygiene, 118 (62.1%) had fair hygiene, and 29 (15.3%) had poor hygiene. (Figure 1)

The relationship between brushing frequency and oral hygiene status was statistically significant ($p < 0.001$). (Table 1). A significant association was also found between the use of additional oral cleaning aids and oral hygiene status ($p < 0.001$). (Table 2). The frequency of dentist visits also showed a significant association with oral hygiene status ($p < 0.001$). (Table 3). In terms of the frequency of consuming carbonated drinks, there was a statistically significant association with oral hygiene ($p < 0.001$). The frequency of changing toothbrushes did not show a significant association with oral hygiene status ($P = 0.18$).

Table 1.Stratification of oral hygiene index with frequency of brushing teeth							
		Frequency of brushing teeth	Total	P value	Frequency of brushing teeth	Total	P value
Oral Hygiene Index	Excellent	0	1	1	1	3	0.0001
		0.0%	33.3%	33.3%	33.3%	100.0%	
	Good	0	13	27	0	40	
		0.0%	32.5%	67.5%	0.0%	100.0%	
	Fair	3	83	32	0	118	
		2.5%	70.3%	27.1%	0.0%	100.0%	
	Poor	6	20	3	0	29	
		20.7%	69.0%	10.3%	0.0%	100.0%	
Total		9	117	63	1	190	
		4.7%	61.6%	33.2%	0.5%	100.0%	

Table 2. Stratification of oral hygiene index with use of additional oral cleaning aids							
		Use of additional oral cleaning aids					P value
		dental floss	mouth wash	tooth shower	Any other	do not use any	
Oral Hygiene Index	Excellent	1	0	1	1		0.0001
		33.3%	0.0%	33.3%	33.3%	0.0%	
	Good	11	17	0	2	10	
		27.5%	42.5%	0.0%	5.0%	25.0%	
	Fair	17	22	1	11	67	
		14.4%	18.6%	0.8%	9.3%	56.8%	
	Poor	2	4	1	2	20	
		6.9%	13.8%	3.4%	6.9%	69.0%	
Total		31	43	3	16	97	
		16.3%	22.6%	1.6%	8.4%	51.1%	

Table 3. Stratification of oral hygiene index with frequency of dentist visit				
		Frequency of dentist visit		P value
		dental problem only	routine check up	
Oral Hygiene Index	Excellent	1		0.001
		33.3%	66.7%	
	Good	34	6	
		85.0%	15.0%	
	Fair	111	7	
		94.1%	5.9%	
	Poor	28	1	
		96.6%	3.4%	
Total		174	16	
		91.6%	8.4%	

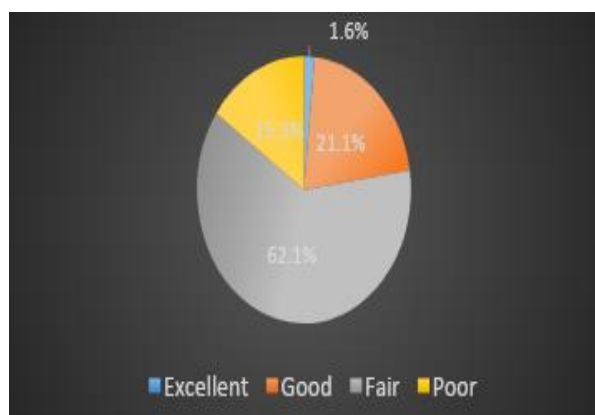


Figure 1 Oral hygiene index

Discussion:

The participants in our study had an average age of 21.91 ± 1.776 years similar to the populations examined in studies like Yadav Ket *al.*¹⁴, where medical students were also the focus. The young age of the participants in both studies suggests that this group is generally more aware of personal hygiene practices, but there is still room for improvement in their daily routines.

In terms of oral health, the Debris Index in our study averaged 1.819 ± 1.0366 , while the Calculus Index was 0.286 ± 0.3905 . These indices, which reflect plaque and tartar buildup, are similar to findings from other studies, such as Sajjad F, where 80% of female college students reported brushing their teeth daily.¹⁵ However our results indicate that 61.6% of the participants brushed their teeth only once per day, which could explain the moderate levels of plaque and calculus observed.

The DMFT score in our study was 0.89 ± 1.349 , indicating a low prevalence of dental caries. This contrasts with Sajjad F's study, where the mean DMFT score was higher, at 2.30.¹⁵ The lower DMFT score in our study may be due to better access to dental care or healthier dietary habits, but it also underscores the variability in caries prevalence across different populations.

In terms of oral hygiene status, most participants in our study had fair hygiene (62.1%), with smaller proportions having good (21.1%) or poor (15.3%) hygiene and only 1.6% achieving excellent hygiene. This distribution is similar to that observed by Dasgupta U et al., who reported that 68.9% of their participants had dental caries largely due to inadequate oral hygiene practices.¹⁶

The use of additional oral cleaning aids, such as dental floss and mouthwash, was significantly associated with better oral hygiene in our study but a large proportion of participants (51.1%) did not use any additional cleaning aids. This finding echoes the results of Yadav K et al, who found that medical students were more likely to use such aids compared to non-medical students.¹⁴

The frequency of dental visits is another important factor in oral health. In our study, 91.6% of participants only visited the dentist when they had a problem, with only 8.4% attending routine check-ups. This is consistent with findings from Elavarasu S et al., who noted that routine dental visits were less common among females, particularly those from lower socioeconomic backgrounds.¹⁷

The consumption of carbonated drinks was another significant factor influencing oral hygiene in our study. Participants who consumed these beverages more frequently had poorer oral hygiene scores, a pattern also observed by Sajjad F.¹⁵

Conclusion:

In conclusion, the findings indicated that while the overall oral health status of female medical students residing in hostels at KIMS is satisfactory in terms of low caries prevalence. There are several areas that require attention, particularly in terms of daily oral hygiene practices, the use of cleaning aids, and preventive dental care. To improve oral health outcomes, targeted educational interventions focusing on these associated factors are recommended.

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