

THE EVALUATION OF ORAL HEALTH STATUS BASED ON DMFT INDEX IN MEDICAL AND DENTAL COLLEGE STUDENTS OF KOHAT

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Abstract

Background: The Decayed, Missing, and Filled Teeth (DMFT) index is a useful tool for measuring and tracking dental health in a population. Keeping this in mind, the present study was initiated to investigate the oral health status and related characteristics among students studying at Medical and Dental College Kohat using the DMFT index

Objective: To assess the oral health status of medical and dentistry students in Kohat, Khyber Pakhtunkhwa, using the DMFT index and identify the contributing factors influencing their oral health.

Material and Methods This cross-sectional descriptive analytical study was conducted at Khyber Medical University, Institute of Medical Sciences (KMU-IMS) and Institute of Dental Sciences (KMU-IDS), Kohat, from November 2023 to November 2024, conducted on 250 students, aged 19-26 years old. Using a questionnaire, data were collected by three trained dental students. The dependent variable was the DMFT index. Data were analyzed using SPSS-26 for T-test, ANOVA and multiple regressions.

Results: In all, 250 persons between the ages of 19 and 26 participated in the study, 150 of them were between the ages of 19 and 22 and 100 were between the ages of 23 and 26. The mean ($\pm$ SD) values of DT, MT, and FT indices in the partakers were 2.66 ± 0.6 , 1.09 ± 1.5 , and 2.5 ± 2.4 , respectively. The mean ($\pm$ SD) value of total DMFT index was 6.25 ± 2.4 in all the subjects, 5.8 ± 2.7 in students aged 19-22 years old, and 6.7 ± 2.1 in students aged 23-26 years old.

Conclusion: A relatively high DMFT score was observed among the participants. However, owing to the cross-sectional nature of the study and the absence of direct assessment of stress and other potential confounding factors, no causal relationship can be established. The findings suggest that oral hygiene behaviors were associated with oral health status among the study population. Changing behavioural routines (such brushing, mouthwash, and tooth floss) and raising parental and individual education levels can enhance oral and dental health.

Keywords: DMFT, WHO, Oral Health, QOL.

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Introduction:

Oral health impacts daily activities, including eating, talking, social interactions, and appearance. Dental caries is the most common oral illness globally, with varying occurrence among countries, regions, and social/ethnic groups¹. Contrary to appearances, oral and dental conditions have a greater negative influence on QoL. WHO has documented oral health as one of the most crucial public health problems

globally due to the substantial impact it has on people's everyday lives². Oral health is still a public health concern, even in industrialized nations, and it is considerably more of an issue in underdeveloped nations, despite the World Health Organization's strong emphasis on it. Even those who are less fortunate in Western side of the European nations with highly developed dental care structure have modest

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dental health³. Dental caries affects 60% to 90% of pupils and 100% of adults worldwide. Approximately 30% of individuals worldwide between the ages of 65 and 74 lack natural teeth⁴.

The DMFT index has been the most significant indicator for evaluating the state of oral & dental health for more than 70 years. Furthermore, in epidemiological examinations of the community's health state, this index is the most significant one⁵. This index calculates the no. of teeth that have caries, the no. of teeth that have been treated, and the no. of teeth that have been lost because of caries. By crafting guidelines & initiatives in this field, this tool is applied to assess & spur community oral health efforts. In many nations, research on the oral & dental health of the elderly and children two high-risk groups continues⁶. Adult dental caries &

oral health status have received less attention, even though tooth decay has been a noteworthy concern for adult populations in both industrialized & evolving countries throughout the previous ten years⁷.

The frequency of dental caries & the aspects influencing it have been examined using a variety of techniques in several research conducted worldwide. Gender, age, educational attainment, brushing habits, oral and dental health literacy, and socioeconomic status were the most significant risk factors for dental caries⁵⁻⁸.

In Pakistan, dental caries is very common. Approximately 50% of youngsters aged 12 have dental cavities. Rendering to the findings of a study in 2022 by Masood *et al*⁹ & by Khan *et al*¹⁰, the mean DMFT score for adults between the ages of 35 and 45 was 11.0, whereas the mean score for young entities aged 18 was 3.4. Furthermore, 53% of people between the ages of 35 and 44 developed periodontal pockets. The most productive demographic in the society is that of people between the ages of 20 and 35, & poor dental health can restrict with their day-to-day activity. However, compared to children and the elderly, there is less information available on the frequency of dental caries and oral health status in this demographic.

Thus, the aim of this study was to examine the oral health status and contributing factors of medical and dentistry students in Kohat using the DMFT index.

Material and Method:

Study design and study participants: This cross-sectional descriptive analytical study was conducted at Khyber Medical University, Institute of Medical Sciences (KMU-IMS) and Institute of Dental Sciences (KMU-IDS), Kohat, from November 2023 to November 2024. The KMU-IDS Kohat Ethics Committee gave its approval to the study under the number KIDS-IRBB/ECC/23-1/05. Prior to taking part in the study, each subject gave their verbal consent. The study

population comprised undergraduate medical and dental students enrolled in both institutions

Sampling Technique: A convenience sampling method was used to collect data.

Sample Size Calculation: The minimum required sample size was calculated using the Epi Info software (version 26, CDC, Atlanta, USA). With a total population of 1255 students, an expected prevalence of dental caries of 29% based on a previous reference study¹¹, a 95% confidence level, and a 5% margin of error, the calculated sample size was 250 participants.

Inclusion and Exclusion Criteria: All consenting students enrolled in MBBS and BDS programs during the study period were eligible to participate. Students who declined to participate or were unwilling to provide informed consent were excluded from the study.

Data Collection Procedure: Data were collected using a pre-tested structured questionnaire and clinical oral examination. The questionnaire assessed demographic information and oral health-related behaviors. Clinical examinations were conducted inside classrooms under natural daylight conditions, with both examiner and student seated near a window. A sterile dental mirror and dental probe were used for inspection. Three trained dental students, who received prior calibration and instruction, served as examiners to ensure consistency in data collection. The decayed, missing, and filled teeth index (DMFT) was used to record oral health status. For each participant, the number of decayed, missing due to caries, and filled teeth were recorded, and the DMFT score was calculated accordingly. Following each examination, results were immediately entered into the questionnaire.

Statistical Analysis: SPSS 26 software was used to conduct statistical analysis in this study at a significance level of $P < 0.05$. The gathered data was described using descriptive statistics (mean, standard deviation (SD), and frequency distribution tables). The DMFT index was evaluated at various levels of the independent variables using the T-test and ANOVA. For a $P < 0.05$ in the univariate analysis, the variables were added to the multiple regression model. Ultimately, the variables that showed significance in the stepwise backward regression test were kept in the model.

Results:

In all, 250 persons between the ages of 19 and 26 participated in the study; 150 of them were between the ages of 19 and 22 and 100 were between the ages of 23 and 26. The mean (SD) values of DT, MT, and FT indices in the partakers were 2.66 ± 0.6 , 1.09 ± 1.5 , and 2.5 ± 2.4 , respectively. The mean (SD) value of total DMFT index was 6.25 ± 2.4 in all the subjects, 5.8 ± 2.7 in students aged 19-22 years old, and 6.7 ± 2.1

in students aged 23-26years old. Of the participants, 170 (68%) said they brushed their teeth once a day. Furthermore, 237 (94.8%) and 160 (64%) of the participants, respectively, stated that they did not use mouthwash and dental floss daily. The ANOVA's findings demonstrated a relationship between the

DMFT score and the frequency of daily brushing ($P=0.001$), daily dental floss use ($P=0.001$), & daily mouthwash use ($P=0.001$). Those who did not use mouthwash (DMFT=6.6), dental floss (DMFT=7.74), or clean their teeth (DMFT=10.2) had lower scores on this index (Table 1)

Variable		N (%)	D Mean (SD*)	M Mean (SD)	F Mean (SD)	DMFT Mean (SD)	P-value**
Total		250 (100)	2.66 (0.6)	1.09 (1.5)	2.5 (2.4)	6.25 (2.4)	
Age groups	19-22	150 (60)	2.74 (1.1)	1.96 (1.0)	1.1 (0.6)	5.8 (2.7)	0.001
	23-26	100 (40)	2.19 (0.9)	2.98 (0.8)	1.53 (0.4)	6.7 (2.1)	
Frequency of tooth brushing per day	0	15 (06)	3.0 (1.9)	4.2 (3.1)	1.7 (1.1)	8.9 (6.1)	0.001
	1	170 (68)	2.2 (0.7)	1.1 (0.6)	3.3 (1.7)	6.6 (3.0)	
	>2	65 (26)	1.3 (0.3)	0.7 (1.0)	3.1 (1.6)	5.1 (2.9)	
Frequency of dental flossing per day	0	160 (64)	3.2 (1.6)	1.4 (1.1)	3.3 (1.8)	7.9 (4.5)	0.001
	1	75 (30)	2.1 (1.2)	0.7 (0.9)	3.1 (1.8)	5.9 (3.9)	
	>2	15 (06)	1.5 (1.4)	0.6 (0.9)	3.0 (1.3)	5.1 (3.6)	
Frequency of using mouthwash per day	0	237 (94.8)	3.2 (1.8)	1.2 (2.0)	3.5 (1.8)	7.9 (5.6)	0.001
	1	10 (04)	1.9 (1.5)	0.4 (0.8)	3.0 (1.3)	5.3 (3.6)	
	>2	03 (1.2)	1.3 (0.8)	0.1 (0.4)	2.4 (1.4)	3.8 (2.6)	

*SD: Standard Deviation

**P-values represent overall one-way ANOVA results. Significant pair wise differences were further examined using Tukey's post-hoc test

Participants who did not use mouthwash, dental floss, or brush their teeth regularly had significantly higher DMFT scores, indicating poorer oral health status (Table 2).

Variables	B(Coefficient)	Std. B	Beta	T	P-value	95%CI* for (B)
Age	0.21	0.078	0.081	3.45	0.001	
Frequency of dental flossing	-1.46	0.097	-0.285	-15.014	0.001	- 1.65 to -1.27
Frequency of using mouthwash	-0.83	0.117	-0.132	-7.011	0.001	-1.06 to -0.61
Frequency of tooth brushing	-0.89	0.097	-0.171	-10.030	0.001	-1.17 to -0.70

*Confidence Interval

Discussion:

According to WHO, the DMFT index was unfavorable at 6.25 for all participants, 5.8 for students aged 19–22, and 6.7 for students aged 23–26. The lack of administration support for community-based oral health promotion activities, limited financial accessibility because of discovering such services, and inadequate attention brought on by study stress are most likely the causes. For those between the ages of 20 and 30, the DMFT index was 10.8 in Turkey¹², 12.28 in Japan¹³, 12.10 in Malaysia¹⁴, 5.2 in South Korea¹⁵, and 14.8 in Iran¹⁶. Iran, Japan, Malaysia, South Korea, and Turkey had DMFT indices of 4.10, 3.24, 2.9, 3.57, and 2.3 for individuals between the ages of 35 and 45. The results of this investigation demonstrated that the DMFT index gets worse with age. Because there are often more decaying, missing, and filled teeth as people age, the WHO establishes a higher DMFT index for older individuals. The DMFT index increased as age increased. Furthermore, some additional research have demonstrated a link between aging and worse oral health¹⁷. Structured surveys may have limits, as children may report socially desired answers like regular dental cleaning. Objective measures, such as clinical

examination, were utilized to address this restriction. The study found that most students cleaned their teeth regularly, which corresponded to clinical plaque buildup levels. Compared to comparable research in impoverished nations, students having dental appointments reported better oral health¹⁸. The findings of this study specified that the DMFT index was low in students practicing brushing, flossing, and using mouthwash. Good oral hygiene practices, such as those listed above, have been shown in several studies to improve oral and dental health. Inappropriate dental hygiene practices can result in worse oral health and raise the risk of oral infections. Additionally, there is a correlation between a lower risk of tooth decay and behavioral practices including brushing, using mouthwash & floss, maintaining a composed diet, and seeing a dentist on a regular basis¹⁹.

Conclusion:

A relatively high DMFT score was observed among the participants. However, owing to the cross-sectional nature of the study and the absence of direct assessment of stress and other potential confounding factors, no causal relationship can be established. The findings suggest that oral hygiene behaviors were associated with oral health status among the study population . Changing

behavioural routines (such brushing, mouthwash, and tooth floss) and raising parental and individual education levels can enhance oral and dental health.

LIMITATION: Although DMFT is a count variable, its distribution was approximately normal; therefore, parametric tests and linear regression were applied. Future studies may employ Poisson or negative binomial regression models for greater statistical robustness.

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