

ORIGINAL ARTICLE

Oral Health Related Habits, Knowledge, and Frequency of Dental Floss use among Undergraduate Medical and Dental Students in a Public Health Sector University in Pakistan: A Comparative Study

HINA SHAH¹, SANAA AHMED², SADAF TALHA³, SUMBUL AYAZ⁴, TALHA BIN SAEED⁵, MARIUM IRSHAD⁶

¹BDS, MDS, CHPE, Assistant Professor, Community & Preventive Dentistry, Sindh Institute of Oral Health Sciences, Jinnah Sindh Medical University, Karachi

²BDS, MS (OMFS), MHPE, Assistant Professor Oral Medicine, Sindh Institute of Oral Health Sciences, Jinnah Sindh Medical University, Karachi

³BDS, FCPS part II Trainee Orthodontics, Liaquat College of Medicine and Dentistry

⁴BDS, Lecturer Community & Preventive Dentistry, Sindh Institute of Oral Health Sciences, Jinnah Sindh Medical University, Karachi

⁵BDS, MCPS Trainee, Department of Dentistry, Pakistan Telecommunication Company Limited, Karachi

⁶BDS, Sindh Institute of Oral Health Sciences, Jinnah Sindh Medical University, Karachi

Correspondence to: Hina Shah, Email: shahhina052@gmail.com, Cell: 0315 8750511

ABSTRACT

Objective: The current study aimed to evaluate oral health related habits, knowledge, and frequency of dental floss use among undergraduate medical and dental students.

Methods: A cross-sectional study was undertaken at two institutes, Sindh Institute of Oral Health Sciences (SIOHS) and Sindh Medical College (SMC) of Jinnah Sindh Medical University (JSMU), Karachi, Pakistan, between March to May 2022. All undergraduate medical and dental students irrespective of gender, cast, creed, or socioeconomic status were eligible to partake in the study. The data on demographics including the age, gender, primary way of cleaning teeth, frequency of dental flossing, general oral health habits, assessment of knowledge of interdental cleaning aids etc. were recorded in a structured questionnaire.

Results: The majority of the students acknowledged the importance of the role of students in promoting dental floss use among the community. Years of study in Bachelor of Dental Surgery (BDS) students was significantly associated with cleaning frequency ($p < 0.0001$) and primary cleaning method ($p = 0.001$). Interdental cleaning aid awareness, frequency of interdental cleaning, issues from not cleaning the interdental spaces, the role and use of dental floss were all significantly correlated with year of study among BDS students. Use of secondary methods was significantly associated with years of study among Bachelor of Medicine, Bachelor of Surgery (MBBS) students ($p < 0.001$).

Conclusion: The present study concluded that years of study significantly correlated with the knowledge, awareness, and habits of dental students with respect to dental flossing.

Keywords: dental hygiene, dental floss, interdental cleaning, oral health, dentist, medicine

INTRODUCTION

The most common chronic oral health conditions affecting the global population include dental caries and periodontal diseases like gingivitis and periodontitis. The World Health Organization's fact sheet on oral health describes oral diseases as mostly preventable. Dental caries i.e. tooth decay resulting from plaque formation affects 2 billion adults and around 500 million children around the world. Dental caries result from inadequate plaque removal which provides an optimal environment for bacteria to grow and convert ingested sugars into acids causing enamel damage leading to local infections, systemic complications, psychosocial issues and eventual tooth loss.¹⁻³

Several national studies have concluded that dental caries is extremely prevalent in Pakistan affecting people of all age groups.⁴ These findings have been further solidified within reports presented by the World Health Organization (WHO) on this matter. As a consequence, inter-dental caries and periodontal diseases are also widespread. Prevalence of the latter is documented to be 98% as per the National Oral Health Survey with advanced severe periodontitis at 31%.⁵

These staggering statistics necessitate further investigation into the preventive oral hygiene and healthcare practices of the general population. Students of undergraduate programs in medicine and dentistry are the foundation of the country's future healthcare system and as such are expected to follow the best preventive oral healthcare practices. They are also expected to endorse these practices and educate the population on oral health.

As expected the literature suggests that dentistry students exhibit better knowledge and practices with regards to oral hygiene indicating the importance of education being imparted. Yao, Ke et al. conducted a cross-sectional study on oral hygiene practices and oral health amongst medical and dental students and found a dire lack of best practices and knowledge especially among medical students.⁶ Munz, Stephanie M et al. also found similar results with their study. Dental students had overall better knowledge and practice when compared to medical students of the

same academic year and both knowledge and practice of oral hygiene improved as both sets of students progressed academically.⁷ Naseem, Sajida et al. showed the lack of proper cleaning technique used by medical students.⁷

The benefits of dental floss in reducing caries and thus improving health outcomes is supported by the literature, especially when paired with regular tooth brushing with proper technique.^{8,9} Interdental plaque removal with regular flossing theoretically prevents interdental caries and thus periodontal disease. Hujoel, P P et al. report no substantial benefit of self-flossing in adolescents but did report benefit of flossing done by a professional in children.¹⁰

This study aims to investigate the knowledge and oral hygiene practices of undergraduate medical and dental students with emphasis on dental flossing and presence of interdental caries. The study further compares the two groups and discusses the relevance of education and its impact on the quality of preventive oral hygiene practices. This information can prove beneficial in establishing the importance of flossing and in introducing reforms to better oral health education and ultimately oral health itself.

The study aimed to evaluate oral health related habits, knowledge, and frequency of dental floss use among undergraduate medical and dental students in a public health sector university in Pakistan.

METHODS AND MATERIAL

A cross-sectional study was undertaken at two institutes, Sindh Institute of Oral Health Sciences (SIOHS) and Sindh Medical College (SMC) of Jinnah Sindh Medical University (JSMU), Karachi, Pakistan, between March to May 2022, after approval from the Institutional review board of JSMU.

For the enrollment of participants, a non-probability convenience sampling technique was employed. For sample size estimation, select statistics electronic software was used. Knowledge regarding flossing was reported to be 87.14% among

the undergraduates of medical and dental institutes. Keeping 87.14%, 8 as the sample proportion, and a population of undergraduate students who know the use of dental floss in Sindh as 144 (74.29%)¹⁰, the margin of error as 5%, and a confidence level of 95%, a sample size of 233 was calculated.

All undergraduate medical and dental students irrespective of gender, cast, creed, or socioeconomic status were eligible to partake in the study. All participants aged above 18 years were included. The entire teaching and non-teaching medical and dental faculty were excluded from the study. Moreover, graduated students and house officers were also excluded.

Structured questionnaire was designed to collect data from the undergraduate medical and dental students of SIOHS and SMC, JSMU. The questionnaire consisted of close-ended questions. The structured questionnaires were self-administered.

The data on demographics including the age, gender, primary way of cleaning teeth, frequency of dental flossing, general oral health habits, assessment of knowledge of interdental cleaning aids etc. were recorded in a predefined structured questionnaire.

All data was entered and analyzed using SPSS version 26. Percentages and frequencies were calculated to assess the knowledge and implementation of that knowledge amongst the undergraduate medical and dental students. Comparative association between fields (MBBS versus Dental) and the use of dental floss was done using chi square test. A p-value of < 0.05 was set as the cut off for statistical significance.

All the individuals who gave their verbal and written consent were included in the study. The participants were assured that the maintenance of their anonymity and confidentiality throughout the period of the study. No personal identifiers such as full names, address, home number etc. were documented or collected. The data remained accessible to the principal author and co-author at all times.

RESULT

The study demographics of the study participants are given in table 1.

Table 1: Demographics of the study participants

Parameters	MBBS (250)	BDS (200)	p-value
Age			0.93
18-20	76 (30.4%)	58 (29%)	
21-23	172 (68.8%)	140 (70%)	
24-26	2 (0.8%)	2 (1%)	
Gender			0.005
Male	92 (36.8%)	49 (24.5%)	
female	158 (63.2%)	151 (75.5%)	
Year			< 0.0001
1	59 (23.6%)	54 (27%)	
2	59 (23.6%)	49 (24.5%)	
3	49 (19.6%)	45 (22.5%)	
4	47 (18.8%)	50 (25%)	
5	36 (14.4%)	2 (1%)	

Oral health related habits were compared between MBBS and BDS students. It was found that dental floss use was more likely in BDS students (<0.0001) than MBBS students (Table 2).

Table 2: Oral health related habits (MBBS versus BDS)

Habits	BDS	MBBS	p-value
Primary cleaning			0.823
toothbrush with toothpaste	193 (96.5%)	240 (96%)	
Toothbrush with tooth powder	4 (2%)	4 (1.6%)	
Miswak	3 (1.98%)	4 (1.6%)	
Other	0 (0%)	2 (0.8%)	
Clean frequency			0.123
Once a day	58 (29%)	92 (36.8%)	
Twice a day	137 (68.5%)	156 (62.4%)	
Alternate days	5 (2.5%)	0 (0%)	
Rarely	0 (0%)	2 (0.8%)	
Secondary method			<0.0001
Mouthwash	74 (37%)	127 (50.8%)	
Dental floss	85 (42.5%)	47 (18.8%)	
Toothpick	13 (6.5%)	51 (20.4%)	
Interdental brushes	19 (9.5%)	0 (0%)	
Others	9 (4.5%)	25 (10%)	

Table 3: Association of knowledge and frequency of use of dental floss (MBBS versus BDS)

Parameters	BDS 200	MBBS 250	p-value
Interdental Cleaning aid awareness			< 0.0001
dental floss	112 (56%)	115 (46%)	
interdental brushes	10 (5%)	4 (1.6%)	
waterjets	6 (3%)	6 (2.4%)	
rubber tips	4 (2%)	0 (0%)	
wooden toothpicks	10 (5%)	82 (32.8%)	
all	58 (29%)	43 (17.2%)	
Importance of Interdental cleaning			0.01
not important	4 (2%)	8 (3.2%)	
somewhat important	2 (1%)	18 (7.2%)	
important	25 (12.5%)	53 (21.2%)	
very important	32 (16%)	57 (22.8%)	
extremely important	137 (68.5%)	115 (46%)	
Frequency of Interdental cleaning			0.001
once a day	68 (34%)	119 (47.6%)	
twice a day	76 (38%)	51 (20.4%)	
once a week	18 (9%)	15 (6%)	
twice a week	23 (11.5%)	15 (6%)	
don't know	13 (6.5%)	49 (19.6%)	
other	2 (1%)	0 (0%)	
Issues from not cleaning interdental			0.377
plaque in gum line	79 (39.5%)	115 (46%)	
interdental caries	74 (37%)	98 (39.2%)	
calculus	36 (18%)	23 (9.2%)	
bad breath	9 (4.5%)	10 (4%)	
other	2 (1%)	4 (1.6%)	
Use dental floss	114 (57%)	76 (30.4%)	< 0.0001
What is Dental floss			0.057
thread to clean b/w teeth	182 (91%)	197 (78.8%)	
aid to whiten teeth	4 (2%)	18 (7.2%)	
not sure	14 (7%)	35 (14%)	
Role of dental floss			0.131
remove food particles from teeth	157 (78.5%)	172 (68.8%)	
prevent calculus buildup	23 (11.5%)	19 (7.6%)	
prevent/remove stains	4 (2%)	6 (2.4%)	
not sure	9 (4.5%)	27 (10.8%)	
ticked 3 or more	7 (3.5%)	25 (10%)	
Reason for the use of dental floss			<0.0001
recommended by doctor	14 (7%)	12 (4.8%)	
recommended by friend/relative	6 (3%)	20 (8%)	
encouraged by medical/dental curriculum	36 (18%)	12 (4.8%)	
personal choice	144 (72%)	207 (82.8%)	
Floss frequency			<0.0001
Once a day	60 (30%)	35 (14%)	
Once a week	23 (11.5%)	31 (12.4%)	
Twice a week	27 (13.5%)	10 (4%)	
Never	77 (38.5%)	158 (63.2%)	
Other	13 (6.5%)	16 (6.4%)	
Time of dental flossing			0.002
Morning	34 (17%)	20 (8%)	
Night	30 (15%)	35 (14%)	
After meal	49 (24.5%)	31 (12.4%)	
Other	87 (43.5%)	164 (65.6%)	
Floss before or after brushing			0.044
before	40 (20%)	20 (8%)	
after	54 (27%)	61 (24.4%)	
N/A	106 (53%)	170 (68%)	
Importance of floss			0.002
not important	8 (4%)	16 (6.4%)	
important	30 (15%)	72 (28.8%)	
very important	58 (29%)	82 (32.8%)	
extremely important	104 (52%)	80 (32%)	
Flossing Issues			0.031
difficulty	30 (15.5%)	27 (10.8%)	
bleeding gums	23 (11.5%)	57 (22.8%)	
time consuming	36 (18%)	18 (7.2%)	
creates spaces	22 (11%)	16 (6.4%)	
not easily available	4 (2%)	12 (4.8%)	
other	4 (2%)	8 (3.2%)	
N/A	77 (38.5%)	100 (40%)	
all	4 (2%)	14 (5.6%)	
Plan to start/continue floss	177 (88.5%)	174 (69.6%)	0.001

BDS students had significantly greater information on interdental cleaning aid (<0.0001), knew significantly more about the importance of interdental cleaning (p=0.01), more frequently

used dental floss, and had significantly greater awareness about dental floss as illustrated in Table 3.

It was also found that the majority of the students acknowledged the importance of the role of students in promoting dental floss use among the community. We also found that the dental students were more likely to recommend use of dental floss than the medical students ($p=0.001$).

Years of study in BDS students was significantly associated with cleaning frequency ($p<0.0001$) and primary cleaning method ($p=0.001$) (Table 4).

Table 4: Association of oral health related habits with Year of Study (BDS)

Parameter	Year 1 55	Year 2 50	Year 3 45	Year 4 50	p-value
Primary cleaning					0.001
toothbrush with toothpaste	50 (90.9%)	45 (90%)	45 (100%)	50 (100%)	
Toothbrush with tooth powder	1 (1.8%)	5 (10%)	0 (0%)	0 (0%)	
Miswak	4 (7.3%)	0 (0%)	0 (0%)	0 (0%)	
Clean frequency					<0.0001
Once a day	30 (54.5%)	13 (26%)	11 (24.4%)	5 (10%)	
Twice a day	25 (45.5%)	33 (66%)	32 (71.1%)	45 (90%)	
Alternate days	0 (0%)	4 (8%)	2 (4.4%)	0 (0%)	
Secondary method					0.733
Mouthwash	16 (29.1%)	16 (32%)	17 (37.8%)	20 (40%)	
Dental floss	19 (34.5%)	18 (36%)	18 (40%)	21 (42%)	
Toothpick	5 (9.1%)	5 (10%)	2 (4.4%)	3 (6%)	
Interdental brushes	13 (23.6%)	7 (14%)	6 (13.3%)	4 (8%)	
Others	2 (3.6%)	4 (8%)	2 (4.4%)	2 (4%)	

Table 5: Association of knowledge and awareness regarding dental floss with Year of Study (BDS)

Parameter	Year 1 55	Year 2 50	Year 3 45	Year 4 50	p-value
Interdental Cleaning aid awareness					<0.0001
dental floss	22 (40%)	13 (26%)	38 (84.4%)	37 (74%)	
interdental brushes	5 (9.1%)	7 (14%)	0 (0%)	0 (0%)	
Waterjets	4 (7.3%)	2 (4%)	0 (0%)	0 (0%)	
rubber tips	4 (7.3%)	1 (2%)	0 (0%)	0 (0%)	
wooden toothpicks	9 (16.4%)	2 (4%)	0 (0%)	0 (0%)	
all	13 (23.6%)	25 (50%)	7 (15.6%)	13 (26%)	
Importance of Interdental cleaning					0.045
not important	2 (3.6%)	1 (2%)	0 (0%)	0 (0%)	
somewhat important	2 (3.6%)	2 (4%)	0 (0%)	0 (0%)	
important	14 (25.5%)	2 (4%)	6 (13.3%)	4 (8%)	
very important	8 (14.5%)	11 (22%)	7 (15.6%)	7 (14%)	
extremely important	29 (52.7%)	34 (68%)	32 (71.1%)	39 (78%)	
Frequency of Interdental cleaning					<0.0001
once a day	7 (12.7%)	18 (36%)	25 (55.6%)	18 (36%)	
twice a day	26 (47.3%)	12 (24%)	9 (20%)	27 (54%)	
once a week	5 (9.1%)	7 (14%)	5 (11.1%)	2 (4%)	
twice a week	4 (7.3%)	11 (22%)	5 (11.1%)	3 (6%)	
don't know	11 (20%)	2 (4%)	0 (0%)	0 (0%)	
other	2 (3.6%)	0 (0%)	0 (0%)	0 (0%)	
Issues from not cleaning interdental					<0.0001
plaque in gum line	18 (32.7%)	16 (32%)	7 (15.6%)	36 (72%)	
interdental caries	22 (40%)	16 (32%)	31 (68.9%)	5 (10%)	
calculus	7 (12.7%)	15 (30%)	7 (15.6%)	7 (14%)	
bad breath	8 (14.5%)	1 (2%)	0 (0%)	2 (4%)	
other	0 (0%)	2 (4%)	0 (0%)	0 (0%)	
What is Dental floss					<0.0001
thread to clean b/w teeth	39 (70.9%)	48 (96%)	45 (100%)	50 (100%)	
aid to whiten teeth	2 (3.6%)	2 (4%)	0 (0%)	0 (0%)	
not sure	14 (25.5%)	0 (0%)	0 (0%)	0 (0%)	
Role of dental floss					<0.0001
remove food particles from teeth	29 (52.7%)	32 (64%)	40 (88.9%)	48 (96%)	
prevent calculus buildup	11 (20%)	11 (22%)	4 (8.9%)	0 (0%)	
prevent/remove stains	4 (7.3%)	2 (4%)	0 (0%)	0 (0%)	
not sure	9 (16.4%)	1 (2%)	0 (0%)	0 (0%)	
ticked 3 or more	2 (3.6%)	4 (8%)	2 (4.4%)	2 (4%)	

Interdental cleaning aid awareness, frequency of interdental cleaning, issues from not cleaning the interdental spaces, the role and use of dental floss were all significantly correlated with year of study among BDS students as illustrated in table 5.

Table 6 illustrates the association between use of dental floss with year of study among dental students. It was found that timing of flossing and habit of flossing before or after brushing significantly improved with increase in year of study ($p<0.001$). Moreover, the importance of flossing was significantly higher in final year dental students than the junior students ($p<0.0001$).

Table 6: Association of frequency of use of dental floss with Year of Study (BDS)

Parameter	Year 1 55	Year 2 50	Year 3 45	Year 4 50	p-value
Use dental floss	25 (45.5%)	31 (62%)	31 (68.9%)	25 (50%)	0.073
Why dental floss					0.594
recommended by doctor	32 (58.2%)	22 (44%)	16 (35.6%)	14 (28%)	
recommended by friend/relative	15 (27.3%)	22 (44%)	22 (48.9%)	25 (50%)	
encouraged by curriculum	8 (14.5%)	6 (12%)	7 (15.6%)	11 (22%)	
Floss frequency					0.127
Once a day	4 (7.3%)	3 (6%)	0 (0%)	3 (6%)	
Once a week	5 (9.1%)	14 (28%)	16 (35.6%)	12 (24%)	
Twice a week	14 (25.5%)	9 (18%)	13 (28.9%)	18 (36%)	
Other	2 (3.6%)	5 (10%)	2 (4.4%)	2 (4%)	
Never	30 (54.5%)	19 (38%)	14 (31.1%)	25 (50%)	
When floss					0.001
Morning	6 (10.9%)	5 (10%)	10 (22.2%)	14 (28%)	
Night	4 (7.3%)	13 (26%)	14 (31.1%)	2 (4%)	
After meal	15 (27.3%)	13 (26%)	7 (15.6%)	9 (18%)	
Other	30 (54.5%)	19 (38%)	14 (31.1%)	25 (50%)	
Floss before or after brushing					<0.0001
before	10 (18.2%)	15 (30%)	19 (42.2%)	0 (0%)	
after	15 (27.3%)	16 (32%)	12 (26.7%)	25 (50%)	
N/A	30 (54.5%)	19 (38%)	14 (31.1%)	25 (50%)	
Importance of floss					<0.0001
not important	8 (14.5%)	1 (2%)	0 (0%)	0 (0%)	
important	11 (20%)	7 (14%)	11 (24.4%)	2 (4%)	
very important	14 (25.5%)	11 (22%)	9 (20%)	21 (42%)	
extremely important	22 (40%)	31 (62%)	25 (55.6%)	27 (54%)	
Flossing Issues					0.012
difficulty	5 (9.1%)	7 (14%)	4 (8.9%)	11 (22%)	
bleeding gums	3 (5.5%)	9 (18%)	7 (15.6%)	2 (4%)	
time consuming	5 (9.1%)	11 (22%)	13 (28.9%)	5 (10%)	
creates spaces	7 (12.7%)	2 (4%)	7 (15.6%)	4 (8%)	
not easily available	0 (0%)	1 (2%)	0 (0%)	1 (2%)	
other	4 (7.3%)	1 (2%)	0 (0%)	0 (0%)	
N/A	30 (54.5%)	19 (38%)	14 (31.1%)	25 (50%)	
all	1 (1.82%)	0 (0%)	0 (0%)	2 (4%)	
Plan to start/continue floss	45 (81.8%)	40 (80%)	43 (95.6%)	46 (92%)	0.058

Use of secondary methods was significantly associated with years of study among MBBS students ($p<0.001$) (Table 7).

Table 7: Association of oral health related habits with Year of Study (MBBS)

Parameters	Year 1 59	Year 2 59	Year 3 49	Year 4 47	Year 5 36	p-value
Primary cleaning						0.279
toothbrush with toothpaste	55 (93.2%)	57 (96.6%)	49 (100%)	43 (91.5%)	36 (100%)	
Toothbrush with tooth powder	4 (6.8%)	2 (3.4%)	0 (0%)	0 (0%)	0 (0%)	
Miswak	0 (0%)	0 (0%)	0 (0%)	4 (8.5%)	0 (0%)	
Clean frequency						0.071
Once a day	14 (23.7%)	31 (52.5%)	22 (44.9%)	8 (17%)	17 (47.2%)	
Twice a day	43 (72.9%)	28 (47.5%)	27 (55.1%)	39 (83%)	19 (52.8%)	
Alternate days	2 (3.4%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	
Secondary method						<0.0001
Mouthwash	24 (40.7%)	43 (72.9%)	18 (36.7%)	18 (38.3%)	25 (69.4%)	
Dental floss	8 (13.6%)	6 (10.2%)	10 (20.4%)	16 (34%)	7 (19.4%)	
Toothpick	28 (47.5%)	6 (10.2%)	10 (20.4%)	8 (17%)	0 (0%)	
Others	0 (0%)	4 (6.8%)	12 (24.5%)	6 (12.8%)	4 (11.1%)	

Only the interdental cleaning awareness, its significance, and issues from not flossing significantly changed among MBBS students with respect to year of study as demonstrated in Table 8.

Table 8: Association of knowledge and awareness regarding dental floss with Year of Study (MBBS)

Parameters	Year 1 59	Year 2 59	Year 3 49	Year 4 47	Year 5 36	p-value < 0.0001
Interdental Cleaning aid awareness						
dental floss	37 (62.7%)	28 (47.5%)	29 (59.2%)	14 (29.8%)	8 (22.2%)	
interdental brushes	0 (0%)	0 (0%)	0 (0%)	0 (0%)	4 (11.1%)	
waterjets	2 (3.4%)	4 (6.8%)	0 (0%)	0 (0%)	0 (0%)	
wooden toothpicks	10 (16.9%)	19 (32.2%)	12 (24.5%)	31 (66%)	9 (25%)	
all	10 (16.9%)	8 (13.6%)	8 (16.3%)	2 (4.3%)	15 (41.7%)	
Importance of Interdental cleaning						0.017
not important	2 (3.4%)	0 (0%)	4 (8.2%)	0 (0%)	0 (0%)	
somewhat important	2 (3.39%)	4 (6.78%)	8 (16.33%)	0 (0%)	4 (11.11%)	
important	4 (6.78%)	22 (37.3%)	10 (20.4%)	16 (34.1%)	4 (11.11%)	
very important	16 (27.1%)	8 (13.6%)	15 (30.6%)	4 (8.5%)	13 (36.1%)	
extremely important	35 (59.3%)	26 (44.1%)	12 (24.5%)	27 (57.5%)	15 (41.7%)	
Frequency of Interdental cleaning						0.415
once a day	33 (55.9%)	26 (44.1%)	21 (42.9%)	19 (40.4%)	19 (52.8%)	
twice a day	12 (20.3%)	20 (33.9%)	2 (4.1%)	10 (21.3%)	7 (19.4%)	
once a week	0 (0%)	4 (6.8%)	4 (8.16%)	6 (12.77%)	2 (5.56%)	
twice a week	2 (3.39%)	2 (3.39%)	6 (12.24%)	2 (4.26%)	4 (11.11%)	
other	12 (20.3%)	8 (13.6%)	16 (32.6%)	10 (21.3%)	4 (11.11%)	
Issues from not cleaning interdental						0.195
plaque in gum line	35 (59.3%)	30 (50.8%)	12 (24.5%)	23 (48.9%)	15 (41.7%)	
interdental caries	20 (33.9%)	21 (35.6%)	19 (38.8%)	22 (46.8%)	15 (41.7%)	
calculus	0 (0%)	6 (10.17%)	12 (24.5%)	2 (4.26%)	4 (11.11%)	
bad breath	4 (6.78%)	0 (0%)	4 (8.16%)	0 (0%)	2 (5.56%)	
other	0 (0%)	2 (3.39%)	2 (4.08%)	0 (0%)	0 (0%)	
What is Dental floss						0.749
thread to clean b/w teeth	43 (72.9%)	45 (76.3%)	41 (83.7%)	39 (83%)	28 (77.8%)	
aid to whiten teeth	4 (6.8%)	6 (10.2%)	4 (8.2%)	4 (8.5%)	0 (0%)	
not sure	12 (20.3%)	8 (13.56%)	4 (8.16%)	4 (8.51%)	8 (22.22%)	
Role of dental floss						0.117
remove food particles from teeth	35 (59.3%)	41 (69.5%)	41 (83.7%)	27 (57.5%)	26 (72.2%)	
prevent calculus buildup	0 (0%)	6 (10.17%)	0 (0%)	6 (12.77%)	8 (22.22%)	
prevent/remove stains	2 (3.39%)	2 (3.39%)	0 (0%)	0 (0%)	0 (0%)	
not sure	10 (16.9%)	4 (6.78%)	2 (4.08%)	10 (21.3%)	2 (5.56%)	
ticked 3 or more	12 (20.4%)	6 (10.17%)	6 (12.24%)	2 (4.26%)	0 (0%)	
Why use dental floss?						0.001
recommended by doctor	0 (0%)	4 (6.78%)	0 (0%)	4 (8.51%)	4 (11.11%)	
recommended by friend/relative	16 (27.1%)	4 (6.78%)	0 (0%)	0 (0%)	0 (0%)	
encouraged by medical/dental curriculum	0 (0%)	4 (6.78%)	6 (12.24%)	0 (0%)	2 (5.56%)	
personal choice	43 (72.9%)	47 (79.7%)	43 (87.8%)	43 (91.5%)	30 (83.3%)	
Floss frequency						0.561
Once a day	6 (10.2%)	12 (20.3%)	2 (4.1%)	12 (25.5%)	4 (11.1%)	
Once a week	4 (6.8%)	8	6 (12.2%)	6	7 (19.4%)	

		(13.56%)		(12.77%)		
Twice a week	2 (3.4%)	2 (3.39%)	4 (8.2%)	0 (0%)	2 (5.6%)	
Never	45 (76.3%)	35 (59.3%)	35 (71.4%)	24 (51.1%)	19 (52.8%)	
Other	2 (3.4%)	2 (3.39%)	2 (4.1%)	6 (12.8%)	4 (11.1%)	
Time of dental flossing						0.102
Morning	2 (3.4%)	12 (20.3%)	3 (6.1%)	0 (0%)	2 (5.6%)	
Night	8 (13.6%)	4 (6.8%)	4 (8.2%)	10 (21.3%)	7 (19.4%)	
After meal	12 (20.3%)	6 (10.2%)	4 (8.2%)	6 (12.8%)	4 (11.1%)	
Other	37 (62.7%)	37 (62.7%)	37 (75.5%)	29 (61.7%)	23 (63.9%)	
Floss before or after brushing						0.218
before	4 (6.78%)	2 (3.39%)	4 (8.16%)	8 (17.02%)	2 (5.56%)	
after	8 (13.56%)	20 (33.9%)	8 (16.33%)	10 (21.3%)	15 (41.7%)	
N/A	47 (79.7%)	37 (62.7%)	37 (75.5%)	29 (61.7%)	19 (52.8%)	
Importance of floss						0.152
not important	0 (0%)	0 (0%)	4 (8.16%)	0 (0%)	0 (0%)	
important	16 (27.2%)	12 (20.3%)	23 (46.9%)	18 (38.3%)	15 (41.7%)	
very important	24 (40.7%)	20 (33.9%)	10 (20.4%)	14 (29.8%)	15 (41.7%)	
extremely important	20 (33.9%)	28 (47.5%)	12 (24.5%)	16 (34.1%)	6 (16.7%)	
Flossing Issues						0.002
difficulty	6 (10.17%)	10 (16.9%)	4 (8.16%)	0 (0%)	7 (19.44%)	
bleeding gums	20 (33.9%)	21 (35.6%)	6 (12.24%)	6 (12.77%)	4 (11.11%)	
time consuming	10 (16.9%)	2 (3.39%)	2 (4.08%)	4 (8.51%)	0 (0%)	
creates spaces	0 (0%)	4 (6.78%)	2 (4.08%)	10 (21.3%)	0 (0%)	
not easily available	2 (3.39%)	6 (10.17%)	4 (8.16%)	0 (0%)	0 (0%)	
other	4 (6.78%)	0 (0%)	2 (4.08%)	0 (0%)	0 (0%)	
N/A	18 (30.5%)	14 (23.7%)	25 (51.1%)	25 (53.2%)	17 (47.2%)	
all	0 (0%)	0 (0%)	4 (8.16%)	2 (4.26%)	8 (22.22%)	
Plan to start/continue floss	41 (69.5%)	41 (69.5%)	25 (51.1%)	41 (87.2%)	23 (63.9%)	0.197

DISCUSSION

As a part of the future healthcare body, medical and dental students must not only have appropriate oral health knowledge but also abide by the protocols and conduct of oral hygiene as it is vital in influencing not only their health and quality of life but also their oral health attitude and behavior. Hence, it is critical to determine their oral health knowledge, behavior, and status, all of which are extremely important to them and their patients.

Even as freshers, over 90% of students cleaned their teeth by primary methods at least twice a day, which was far greater than 36% of adults recorded in a survey of the Pakistani population by Asadi et al who clean their teeth every day.¹¹ An even better percentage was demonstrated by a survey carried out by Rahardjo et al among dental students in four Asian countries,¹² thereby indicating a progressively improving awareness and practices based on the oral health of the recent generations. In support of the preceding statistics, another study by Maher et al demonstrated that the percentage of periodontally healthy persons at age 12 was recorded to be three times greater than subjects aged 50 or more.¹³

For thorough cleaning of teeth, flossing is just as important as brushing. As demonstrated by a Turkish study by Peker et al, about 32% of Turkish dental students flossed regularly, but just 16% of Indian dental students flossed regularly thereby indicating that there is a lack of flossing awareness and practice in the region of the subcontinent.¹⁴ However, in the present study, while comparing the medical and dental students, no significant growing pattern of awareness of the flossing technique and its benefits was observed among the dental students over the increasing year of

study. Rather, an even more random distribution of percentages among the medical students was recorded across their years of study. The dental students were relatively better at abiding by the dental hygiene parameters than the medical subset.

It was observed in the present study including various other studies that dental students surpassed medical students in oral health knowledge and cleaning techniques, particularly about the floss method, its importance, frequency, and accuracy. However, both subsets of students shared a relatively similar ratio of understanding the effects of poor hygiene, plaque buildup, and the issues like bad breath, caries, bleeding, etc that stem from not incorporating floss in their dental hygiene routine. The dental students can still understand interventions to avert oral diseases and the commonly linked systemic diseases,¹⁵ owing to the fact that dental students receive greater oral health instruction from numerous sources in dental college on the relevant subject as it aligns with their professional course outline and future career prospects.

Periodontal issues should never be disregarded as they are a potential risk factor for the development of heart disease, diabetes, cancer, and hypertension, among other diseases that can pose a danger to human health. Alongside, the development of dental lesions like caries can be easily deterred with good oral hygiene practices that include the usage of dental floss, interdental brushes, mouthwash, nutritional management, fluoride treatment, antimicrobials, sealants, etc.¹⁶ Our study could not identify any significance amid the increasing level of year of study and the use of dental floss overall. Even though the use of dental floss in conjunction with regular teeth brushing is generally suggested for the prevention of gingival diseases,¹⁷ global data are not promising,¹⁸ thus the therapeutic regimen must be individualized and must bear only the relevant corrective measures. In the present study, as compared to toothbrush and toothpaste users, the percentage of people who use dental floss is substantially lower. This is consistent with many other studies including Madan et al.¹⁹ thereby causing the senior dentists to form a strong consensus that flossing should be taught in schools, allowing for early acceptance.

Studying the oral health-related conditions in Pakistani dentistry and medical schools and the relevant health practices can induce an educational reform for better outcomes by collecting and comparing self-reported surveys. Despite the use of anonymous surveys, the self-reported design may create bias due to the socially-oriented responses.

CONCLUSION

The present study concluded that years of study significantly correlated with the knowledge, awareness, and habits of dental students with respect to dental flossing. The junior year students had a lower level of knowledge and less frequently engaged in dental flossing. However, medical students' level of knowledge and awareness did not significantly change between the junior years and seniors years. However, the interdental cleaning awareness,

its significance, and issues from not flossing significantly changed among MBBS students with respect to year of study.

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