



Oral Health Knowledge, Attitude, and Practices Among Dental and Medical Students in Herat University in 2025

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Article Info	ABSTRACT
Article type: Research Article Received: 23/03/2026 Accepted: 21/07/2026 Published: 23/09/2026	Background and Objective: Oral health is an important component of overall health, and healthcare students are expected to possess adequate oral health knowledge, attitudes, and practices (KAP). This study compared oral health KAP between dental and medical students at Herat University, Afghanistan. Method: A cross-sectional study was conducted among 301 undergraduate dental and medical students at Herat University using proportionate stratified random sampling. Data were collected using a 23-item self-administered questionnaire assessing oral health knowledge, attitudes, and practices. Descriptive statistics, Chi-square tests, and Mann-Whitney U tests were performed using SPSS version 27.0, with statistical significance set at $p < 0.05$. Findings/Results: Dental students demonstrated higher oral health knowledge, attitudes, and practices than medical students. Median knowledge scores were higher among dental students (75.00% vs. 65.62%; $p < 0.001$), as were attitude scores (58.82% vs. 52.94%; $p = 0.016$) and practice scores (75.00% vs. 67.50%; $p < 0.001$). Significant differences were observed in knowledge of recommended brushing techniques, fluoride toothpaste use, flossing, regular dental visits, and perceptions of gingival bleeding. Dental students also reported more favorable preventive oral health behaviors, including flossing and routine dental attendance. Conclusion: Dental students exhibited superior oral health knowledge, attitudes, and practices compared with medical students.

Incorporating additional oral health education into undergraduate medical curricula may help improve oral health awareness and preventive behaviors among future healthcare professionals.

Keywords: Oral health, knowledge, attitude, practice, dental students, medical students

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دانش، نگرش و عملکرد حفظ الصحة جوف دهان و دندان در بین محصلین پوهنهی

ستوماتولوژی و طب در پوهنتون هرات سال ۱۴۰۴

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اطلاعات مقاله	چکیده
نوع مقاله: پژوهشی	زمینه و هدف: سلامت دهان و دندان یک بخش مهمی از سلامت عمومی است و انتظار می‌رود محصلین علوم صحتی از دانش، نگرش و عملکرد (KAP) مناسبی در زمینه سلامت دهان و دندان برخوردار باشند. این مطالعه با هدف مقایسه دانش، نگرش و عملکرد مرتبط با حفظ الصحة دهان و دندان میان محصلین طب دندان و طب معالجوی در پوهنتون هرات، افغانستان انجام شد.
صفحات: ۷۲-۵۵	روش: این مطالعه مقطعی بر روی ۳۰۱ محصل دوره لسانس طب دندان و طب معالجوی پوهنتون هرات با استفاده از روش نمونه‌گیری تصادفی طبقه‌ای متناسب انجام شد. داده‌ها از طریق یک پرسشنامه خودایفا شامل ۲۳ سؤال برای ارزیابی دانش، نگرش و عملکرد در زمینه حفظ الصحة دهان و دندان جمع‌آوری گردید. تجزیه و تحلیل داده‌ها با استفاده از نرم‌افزار SPSS نسخه ۲۷،۰ انجام شد و از آمار توصیفی، آزمون Chi-square و Mann-Whitney U استفاده گردید. سطح معنی‌داری آماری $p < 0.05$ در نظر گرفته شد.
تاریخ دریافت: ۱۴۰۵/۰۱/۰۳	یافته‌ها: محصلین طب دندان در مقایسه با محصلین طب معالجوی، دانش، نگرش و عملکرد به‌طور معنی‌داری بالاتری در زمینه سلامت دهان و دندان داشتند. میان نمره دانش در محصلین طب دندان بیشتر بود (۷۵،۰۰٪ در مقابل ۶۵،۶۲٪) همچنین میان نمره نگرش (۵۸،۸۲٪ در مقابل ۵۲،۹۴٪) و عملکرد (۷۵،۰۰٪ در مقابل ۶۷،۵۰٪) در محصلین طب دندان بالاتر بود. تفاوت‌های معنی‌داری در آگاهی از روش صحیح مسواک
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زدن، استفاده از خمیردندان حاوی فلوراید، استفاده از نخ دندان، مراجعات منظم دندانپزشکی و نگرش نسبت به خونریزی لثه مشاهده شد. علاوه بر این، محصلین طب دندان رفتارهای پیشگیرانه مطلوب‌تری از جمله استفاده منظم از نخ دندان و مراجعه دوره‌ای به داکتر دندان را گزارش کردند.

نتیجه‌گیری: محصلین ستوماتولوژی از سطح بالاتری از دانش و عملکرد در زمینه سلامت دهان و دندان نسبت به محصلین طب برخوردار بودند. تقویت آموزش سلامت دهان و دندان در برنامه‌های درسی مقطع لیسانس طبی می‌تواند به بهبود ارائه خدمات سلامت در آینده کمک کند.

کلیدواژه‌ها: نگرش، محصلین ستوماتولوژی، دانش، محصلین طب، عملکرد، سلامت دهان و دندان

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1. Introduction

Oral health is an essential component of overall well-being and quality of life. A healthy oral cavity enables fundamental functions such as mastication, speech, and social interaction, while also contributing to psychological comfort and self-confidence.

Growing evidence indicates associations between oral diseases and systemic conditions, including cardiovascular disorders, diabetes, and adverse pregnancy outcomes. As a result, oral health promotion extends beyond dentistry and requires engagement from all healthcare professionals. Future members of the healthcare workforce are therefore expected to develop adequate knowledge, positive attitudes, and appropriate practices regarding oral health care.

A substantial body of international research has examined knowledge, attitudes, and practices (KAP) related to oral health among health sciences students. Overall, dental students tend to demonstrate higher knowledge levels than their medical counterparts^[1-4]. They also more frequently report favorable oral hygiene practices, such as regular tooth brushing and routine dental visits^[5,6]. Variations in preventive oral health practices across health-related disciplines have been widely reported, particularly in relation to brushing habits and preventive care behaviors^[7-10]. In addition, awareness of fluoride use in toothpaste appears to be greater among dental students compared with students in other health fields^[11,12]. Collectively, these findings suggest that exposure to dental education is associated with improved oral health awareness and more consistent self-care practices.

Despite this growing evidence base, local evidence remains limited. No previous study has directly compared oral health knowledge, attitudes, and practices between dental and medical students at this institution. Differences in educational curricula, sociocultural context, and access to healthcare services may influence students' knowledge, attitudes, and practices, limiting the applicability of findings from other settings. This gap highlights the need for locally generated evidence.

Therefore, this study aimed to compare oral health knowledge, attitudes, and practices between dental and medical students at Herat University. It was hypothesized that dental students would demonstrate higher knowledge levels and more favorable attitudes and practices than medical students.

The findings may provide baseline information on oral health-related knowledge and attitudes among health sciences students and may assist in identifying areas for curricular improvement. Such evidence can support the integration of more targeted oral health education within health professional training programs.

2. Research Methodology

2.1 Research Design

This study employed a quantitative cross-sectional survey to assess oral health knowledge, attitudes, and practices among dental and medical students at Herat University. A cross-sectional design was selected to provide a snapshot of students'

oral health knowledge, attitudes, and practices, allowing comparison between the two groups.

2.2 Population and Sampling

The target population comprised all undergraduate medical and dental students enrolled at Herat University (N = 953; 658 medical and 295 dental students). The required sample size was calculated using the Raosoft calculator^[13] with a 95% confidence level and a 5% margin of error, resulting in a minimum sample of 274 students. To account for possible non-response, the sample size was increased by 10%, yielding a final sample size of 301 students. A proportionate stratified random sampling approach was used. The faculties of medicine and dentistry were considered separate strata. The total sample size was first allocated proportionally between the two faculties according to the number of enrolled students in each faculty. Then, within each faculty, the sample was further distributed proportionally across the academic years (medical: 7 years, dental: 6 years) based on the number of students in each year. The required number of participants from each class was determined proportionally according to class size by dividing the number of students in each class by the sampling interval ($953/301 = 3.16$). Student attendance lists were obtained from the class records, and random numbers were generated using an online random number generator^[14] to select the required students from each class. This procedure continued until the total sample of 301 students was achieved, consisting of 92 dental students and 209 medical students. The inclusion criteria were enrollment in the undergraduate dental or medical program, willingness to participate, and the ability to read and understand the English-language questionnaire. Students who declined participation, submitted incomplete questionnaires, or were absent during the data collection period were excluded from the study.

2.3 Data Collection Instruments

Data were collected using a self-administered structured questionnaire written in Persian, the participants' primary language, to facilitate comprehension and accurate completion. The questionnaire was organized into 4 parts: The first part elicited information on the demographic attributes of students including faculty (medical or dental) and academic year. Gender was not recorded because all enrolled students were male during the study period.

The second part assessed the participant's oral health knowledge and included 8 questions and assessed participants' understanding of oral health topics such as the purpose of tooth brushing, the recommended type of toothbrush, the interval for changing toothbrushes, flossing, the relationship between oral health and general health, and gum bleeding.

The third part assessed participants' attitudes and included five questions regarding oral health and dental care.

The fourth part assessed oral health practices using 10 questions on dental visits, tooth brushing, flossing, tongue cleaning, and the use of additional oral hygiene aids.

The questionnaire was adapted from previously published oral health KAP instruments, particularly the validated questionnaire used by Kumar et al. and Verma et al. ^[15-16], with minor wording modifications to improve clarity and suitability for the local study population. To establish content validity, the adapted questionnaire was reviewed by three senior faculty members from the Faculty of Dentistry, and their feedback was incorporated into the final version of the questionnaire.

2.4 Data Collection Procedures

Data were collected in classrooms at Herat University over a defined period. After explaining the purpose of the study, eligible students were invited to participate. Students who agreed to participate completed the self-administered questionnaire in the classroom setting. The researcher remained available during data collection to clarify unfamiliar words or terms when requested by participants. Completed questionnaires were collected immediately after completion to ensure completeness and minimize missing data.

2.5 Data Analysis Methods

Data were entered and analyzed using SPSS version 27.0. Descriptive statistics included frequencies and percentages for categorical variables and medians with interquartile ranges (IQRs) for non-normally distributed continuous variables. Means and standard deviations were also reported to facilitate comparison with previous studies. The normality of the overall knowledge, attitude, and practice scores was assessed using the Shapiro–Wilk test. Because the domain scores violated the assumption of normality ($p < 0.05$), the non-parametric Mann–Whitney U test was used to compare the scores between dental and medical students. Effect sizes were reported using the rank-biserial correlation for the Mann–Whitney U test and Cramer's V for Chi-square tests. For categorical variables, frequencies and percentages were compared using the Chi-square test of independence or Fisher's exact test when the expected cell count was less than 5. A p -value < 0.05 was considered statistically significant.

2.6 Ethical Considerations

Ethical approval for this study was obtained from the Herat University Ethics Committee on 14/01/2026 (Protocol No. 10). Informed consent was obtained from all participants prior to data collection. Participants were assured that all responses would remain confidential and anonymous. Participation was entirely voluntary, and students had the right to refuse participation or withdraw from the study at any time without any consequences.

3. Findings / Results

A total of 301 students participated in the study, including 92 dental and 209 medical students. Table 1 shows the faculty and academic year of the participants.

Table 1: Faculty and Academic year distribution of the students

Years		1st year	2nd year	3rd year	4th year	5th year	6th year	7th year	Total
Faculty	Dental	18	15	17	12	12	18	0	92
	Medical	24	29	44	30	31	23	28	209
	Total	42	44	61	42	43	41	28	301

Dental students demonstrated significantly higher levels of knowledge across several domains of oral health. Nearly all dental students (95.65%) recognized the necessity of regular dental visits compared with 71.77% of medical students ($p = 0.001$, Cramer's $V = 0.30$). Similarly, consistent use of fluoride toothpaste ("always") was reported by 60.86% of dental students versus 44.49% of medical students, reaching borderline statistical significance ($p = 0.050$, Cramer's $V = 0.16$).

Knowledge regarding the recommended brushing technique differed markedly between groups. A majority of dental students (61.95%) correctly identified the circular brushing method, compared with only 31.10% of medical students ($p = 0.001$, Cramer's $V = 0.28$). In addition, 41.30% of dental students selected the comprehensive oral hygiene approach (toothbrush, toothpaste, and flossing) versus 10.04% of medical students ($p = 0.001$, Cramer's $V = 0.35$). Understanding of gingival bleeding also varied significantly. While 44.97% of medical students reported that gum bleeding occurs during brushing, only 18.47% of dental students selected this response ($p = 0.001$, Cramer's $V = 0.27$). Differences were also observed in tongue-cleaning practices, with dental students more frequently reporting toothbrush use (66.30% vs. 43.54%), whereas medical students more commonly reported using tongue cleaners (41.14% vs. 18.47%) ($p = 0.001$, Cramer's $V = 0.24$). No statistically significant difference was observed regarding the perceived necessity of mouthwash use (77.17% vs. 70.33%; $p = 0.221$) or preferred toothbrush type (soft toothbrush: 56.52% vs. 44.97%; $p = 0.078$). Overall, dental students consistently demonstrated superior knowledge in key evidence-based oral health practices compared to medical students. Table 2 presents the detailed comparison of dental and medical students' knowledge.

Table 2: Comparison of dental and medical students in terms of knowledge of oral health

Question	Dental	%	Medical	%	Total	%	<i>p-value</i>	<i>Cramer's V</i>
Is it necessary to visit a dental surgeon regularly?							0.001	0.30
Yes	88	95.65	150	71.77	238	79.07		
No	4	4.34	59	28.22	63	20.93		
Is it necessary to use mouthwash to maintain oral hygiene?							0.221	0.08
Yes	71	77.17	147	70.33	218	72.43		
No	21	22.82	62	29.66	83	27.57		
When do you use fluoride toothpaste when brushing?							0.050	0.16
always	56	60.86	93	44.49	149	49.50		
often	18	19.56	42	20.09	60	19.93		
rarely	7	7.60	38	18.18	45	14.95		
never	5	5.43	14	6.69	19	6.31		
I don't know	6	6.52	22	10.52	28	9.30		
Which brushing method is recommended for cleaning teeth?							0.001	0.28
Horizontal	13	14.13	68	32.53	81	26.91		
Vertical	10	10.86	33	15.78	43	14.29		
Circular	57	61.95	65	31.10	122	40.53		
I don't know	10	10.86	41	19.61	51	16.94		
What type of toothbrush is recommended for daily use?							0.078	0.15
Soft	52	56.52	94	44.97	146	48.50		
Medium	31	33.69	76	36.36	107	35.54		
Hard	2	2.17	8	3.82	10	3.32		
None	3	3.26	3	1.43	6	1.99		
I do not know	4	4.34	28	13.39	32	10.63		

What method is recommended to maintain good oral hygiene?							0.001	0.35
Tooth brush and tooth paste and flossing	38	41.30	21	10.04	59	19.60		
Brushes and powder, traditional tooth brushes	9	9.78	34	16.26	43	14.26		
Traditional toothbrushes, mouthwashes	11	11.95	31	14.83	42	13.95		
Mouthwashes, dental flosses	8	8.69	22	10.52	30	9.96		
Toothbrushes and toothpaste, traditional toothbrushes	8	8.69	22	10.52	30	9.96		
Brushes and powder, mouthwashes	9	9.78	41	19.16	50	16.61		
Traditional toothbrushes, dental floss	9	9.78	38	18.18	47	15.61		
when does the gum bleeding usually occur?							0.001	0.27
After waking up	4	4.34	3	1.43	7	2.33		
When brushing your teeth	17	18.47	94	44.97	111	36.88		
Sometimes spontaneously	1	1.08	7	3.34	8	2.66		
When flossing your teeth	13	14.13	5	2.39	18	5.98		
By what means can the tongue be cleaned?							0.001	0.24
Toothbrush	61	66.30	91	43.54	152	50.49		
Tongue cleaners	17	18.47	86	41.14	103	34.21		
I don't know	14	15.21	32	15.31	46	15.28		

A statistically significant difference was observed regarding self-perception of oral malodor (p = 0.001, Cramer's V = 0.21). Only 11.95% of dental students reported feeling that their

mouth smells bad compared with 26.31% of medical students. Additionally, 32.05% of medical students indicated uncertainty (“I don’t know”) compared with 12.73% of dental students. No significant difference was found in having received professional treatment for bad breath ($p = 0.298$). Regarding the timing of perceived bad breath, significant differences were observed between groups ($p = 0.037$, Cramer’s $V = 0.18$). More than half of medical students (52.63%) reported experiencing bad breath after waking up compared with 38.04% of dental students. In contrast, a higher proportion of dental students (39.13%) reported experiencing bad breath when hungry compared with medical students (25.63%). Attitudes toward dental floss use differed significantly between groups ($p = 0.021$, Cramer’s $V = 0.15$). A greater proportion of dental students (72.82%) considered flossing important compared with 58.85% of medical students. Attitudes regarding gingival bleeding also demonstrated a statistically significant difference ($p = 0.008$, Cramer’s $V = 0.17$). More than half of medical students (54.54%) considered bleeding gums to be normal, whereas 61.95% of dental students correctly reported that gingival bleeding is not normal. Table 3 presents the detailed comparison of dental and medical students’ attitudes.

Table 3: Comparison of dental and medical students in terms of attitude of oral health

Question	Dental	%	Medical	%	Total	%	<i>p-value</i>	<i>Cramer's V</i>
Do you feel like your mouth smells bad?							0.001	0.21
Yes	11	11.95	55	26.31	66	21.93		
No	60	65.21	85	40.66	145	48.17		
I don’t know	20	12.73	67	32.05	87	28.90		
Have you ever received any treatment for bad breath from a dentist or general practitioner?							0.298	0.07
Yes	11	11.95	35	16.74	46	15.28		
No	79	85.86	171	81.81	250	83.06		
When do you feel bad breath during the day?							0.037	0.18
After waking up	35	38.04	110	52.63	145	48.17		
When hungry	36	39.13	54	25.63	90	29.90		
When thirsty	4	4.34	13	6.22	17	5.65		
When talking to other people	1	1.08	7	3.34	8	2.66		
When tired	0	0	4	1.91	4	1.33		
During work	1	1.08	0	0	1	0.33		
Morning	5	5.43	15	7.17	20	13.7		
Afternoon	1	1.08	0	0	1	0.33		

Do you think using dental floss is important?							0.021	0.15
Yes	67	72.82	123	58.85	190	63.12		
No	25	27.17	86	41.14	111	36.88		
Do you think bleeding gums is normal?							0.008	0.17
Yes, I do	35	38.04	114	54.54	149	49.50		
No, I don't	57	61.95	95	45.45	152	50.50		

With regard to the consumption of sweet drinks between meals, a statistically significant difference was observed between dental and medical students ($p = 0.005$, Cramer's $V = 0.19$). A higher proportion of dental students reported consuming sweet drinks once daily (41.30%) compared with medical students (23.44%). Flossing practices also differed significantly between the two groups ($p = 0.015$, Cramer's $V = 0.16$). Dental students more commonly reported flossing after each meal (40.21%) compared with medical students (24.88%), whereas a greater proportion of medical students reported never flossing (26.79%) compared with dental students (13.04%). Dental attendance patterns showed highly significant differences ($p = 0.001$, Cramer's $V = 0.34$). Regular biannual dental visits were substantially more common among dental students (40.21%) than medical students (5.74%). In contrast, 32.05% of medical students reported never visiting a dentist for a check-up compared with 15.21% of dental students. Similarly, the timing of the last dental check-up differed significantly between groups ($p = 0.003$, Cramer's $V = 0.22$). No statistically significant differences were observed in tongue cleaning practices ($p = 0.475$), toothbrush replacement frequency ($p = 0.158$), rinsing after eating ($p = 0.270$), or brushing duration ($p = 0.130$). However, mouthwash use differed significantly between groups ($p = 0.023$, Cramer's $V = 0.14$), with 46.73% of dental students reporting usage compared with 33.01% of medical students.

Regarding tooth brushing frequency, a significant difference was found ($p = 0.001$, Cramer's $V = 0.25$). Notably, a higher proportion of medical students reported brushing twice daily (58.85%) compared with dental students (45.65%). However, dental students were more likely to brush once daily (44.56% vs. 15.31%). Despite the higher frequency of twice-daily brushing among medical students, dental students exhibited significantly more comprehensive and evidence-based oral hygiene practices overall, as reflected in their significantly higher mean practice scores (75.05% vs. 67.34%, $p < 0.001$). Table 4 summarizes the comparative analysis of oral health practices between dental and medical students.

Table 4: Comparison of dental and medical students in terms of practice of oral health

Question	Dental	%	Medical	%	Total	%	<i>p-value</i>	<i>Cramer's V</i>
How often do you drink a sweet drink other than tea or coffee between meals?							0.005	0.19
Once a day	38	41.30	49	23.44	87	28.90		
Twice a day	7	7.60	25	11.96	32	10.63		
More than twice a day	4	4.34	24	11.48	28	9.30		

Never	12	13.04	47	22.48	59	19.60		
Occasionally	31	33.69	64	30.62	95	31.56		
How often do you floss your teeth?							0.015	0.16
Sometimes	29	31.52	70	33.49	99	32.89		
Once a day	14	15.21	31	14.83	45	14.95		
After each meal	37	40.21	52	24.88	89	29.57		
never	12	13.04	56	26.79	68	22.59		
How often do you visit the dentist for a dental check-up?							0.001	0.34
						0.00		
Once every six months	31	40.21	12	5.74	43	14.29		
Once every year	5	5.43	26	12.44	31	10.30		
Once in my lifetime	41	44.56	102	48.8	143	47.51		
Never	14	15.21	67	32.05	81	26.91		
When was your last dental checkup?							0.003	0.22
						0.00		
Less than six months ago	40	43.47	49	23.44	89	29.57		
Between six and twelve months ago	7	7.60	32	15.31	39	12.96		
Between one and two years ago	14	15.21	26	12.44	40	13.29		
Never	17	18.47	42	20.09	59	19.60		
I don't remember	14	15.21	58	27.75	72	23.92		
Do you clean your tongue?							0.475	0.05
Yes	56	60.86	118	56.45	174	57.81		
No	36	39.13	91	43.54	127	42.19		
How often do you change your toothbrush?							0.158	0.12
Three months	57	61.95	105	50.23	162	53.82		
Six months	18	19.56	36	17.22	54	17.94		
One year	4	4.34	19	9.09	23	7.66		
Never	3	3.26	15	7.17	18	5.98		
I don't pay attention	10	10.86	34	16.26	44	14.61		
Do you rinse your mouth after eating?							0.270	0.07
Yes, I do	80	86.95	171	81.81	251	83.39		
No, I don't	12	13.04	38	18.18	50	16.61		
Do you use mouthwash?							0.023	0.14
Yes, I do	43	46.73	69	33.01	112	37.21		
No, I don't	49	53.26	140	66.98	189	62.79		
How long do you brush your teeth?							0.130	0.13
Less than a minute	14	15.21	35	16.74	49	16.28		
Two minutes	49	53.26	86	41.14	135	44.85		
Three minutes	11	11.95	31	14.83	42	13.95		
Five minutes	9	9.78	42	20.09	51	16.94		
I don't pay attention	9	9.78	15	7.17	24	7.97		

How many times a day do you brush your teeth?							0.001	0.25
Twice a day	42	45.65	123	58.85	165	54.82		
Once a day	41	44.56	32	15.31	73	24.25		
After each meal	4	4.34	24	11.48	28	9.30		
Once a week	0	0	11	5.26	11	3.65		
Sometimes	2	2.17	15	7.17	17	5.65		
never	3	3.26	4	1.91	7	2.33		

A comparison of the overall domain scores revealed consistently higher performance among dental students compared with medical students across all three domains (Table 4). Because the domain scores violated the assumption of normality (Shapiro-Wilk $p < 0.05$), the non-parametric Mann-Whitney U test was utilized. The median knowledge score was substantially higher in dental students (75.00%, IQR = 18.75) than in medical students (65.62%, IQR = 12.50), a difference that was statistically significant ($U = 6425.5$, $p < 0.001$, rank-biserial $r = 0.332$). Similarly, dental students demonstrated a higher median attitude score (58.82%, IQR = 11.76) compared with their medical counterparts (52.94%, IQR = 11.76; $U = 7962.5$, $p = 0.016$, rank-biserial $r = 0.172$). In the practice domain, dental students also achieved significantly higher median scores (75.00%, IQR = 25.62) than medical students (67.50%, IQR = 10.00; $U = 6886.0$, $p < 0.001$, rank-biserial $r = 0.284$). Overall, dental students outperformed medical students across all three domains, indicating stronger overall oral health-related competencies, despite medical students reporting a higher frequency of brushing twice daily. Table 5 shows the comparison of oral health knowledge, attitude, and practice scores between dental and medical students.

Table 5. Comparison of Overall Knowledge, Attitude, and Practice Scores Between Dental and Medical Students

Variable	Group	N	Mean (%)	SD	Median (IQR)	Test Statistic (U)	p-value	Effect Size (Rank-biserial r)
Knowledge	Dental	92	73	13.22	75.00 (18.75)	6425.5	<0.001	0.332
	Medical	209	66.28	11.62	65.62 (12.50)			
Attitude	Dental	92	59.46	10.41	58.82 (11.76)	7962.5	0.016	0.172
	Medical	209	57.16	9.71	52.94 (11.76)			
Practice	Dental	92	75.05	16	75.00 (25.62)	6886	<0.001	0.284
	Medical	209	67.34	10.9	67.50 (10.00)			

Note: Data are presented as Mean $\pm$ SD or Median (IQR). Comparisons were made using the Mann-Whitney U test due to non-normal distribution of scores.

4. Discussion

Oral health promotion is a fundamental responsibility of future healthcare professionals. Consequently, dental and medical students are expected to demonstrate adequate knowledge and adopt appropriate preventive practices that can later influence patient education and community health outcomes. In the present study conducted at Herat University (n = 301), dental students showed significantly higher overall knowledge scores (73%) compared with medical students (66.28%), indicating a clear disciplinary difference in oral health knowledge. Similar findings were reported by Kumar et al.^[15], who observed significantly greater knowledge and practice scores among dental students than medical students ($P < 0.05$). Likewise, Mohan et al.^[17] demonstrated progressive improvement in oral health knowledge and practice with advancement in dental training, emphasizing the impact of structured professional education. Verma et al.^[16] also reported favorable knowledge levels among postgraduate students, highlighting the role of academic exposure in strengthening preventive orientation.

Brushing frequency differed significantly between the two faculties ($p = 0.001$). Interestingly, a higher proportion of medical students reported brushing twice daily (58.85%) compared to dental students (45.65%). However, brushing frequency alone does not necessarily reflect the quality or comprehensiveness of oral hygiene. Dental students demonstrated significantly more comprehensive oral hygiene practices overall, as reflected in their higher mean practice scores (75.05% vs. 67.34%, $p < 0.001$). They were more likely to use proper brushing techniques (circular method), fluoride toothpaste, and interdental cleaning methods such as dental floss. These findings suggest that although medical students may brush more frequently, dental students' professional education equips them with more effective and evidence-based oral hygiene practices. Similar findings have been reported in previous study by Pradhan D et al.^[18], where dental students demonstrated more favorable oral health behaviors and oral hygiene practices than medical students. Together, these

findings indicate that the quality and comprehensiveness of oral hygiene behaviors may be more important determinants of effective oral health maintenance than brushing frequency alone.

Fluoride toothpaste use was more frequently reported by dental students (60.86%) than medical students (44.49%) ($P = 0.050$), suggesting a greater emphasis on preventive oral health practices among dental students. This finding reflects the influence of professional training on preventive awareness. Similar patterns were observed by Ehsan et al.^[19], who reported moderate levels of oral health knowledge among health profession students; however, this knowledge was not always translated into consistent oral health behaviors. The observed knowledge–practice gap in the present study is consistent with findings from other academic populations, indicating that knowledge alone is insufficient to ensure optimal preventive oral health practices.

Use of fluoride toothpaste and flossing were significantly more prevalent among dental students compared with medical students. Although medical students reported brushing twice daily more frequently, dental students demonstrated more comprehensive evidence-based oral hygiene behaviors overall, including greater use of fluoride toothpaste and dental floss. Similar higher levels of combined preventive oral hygiene practices among dental students have been reported in a previous study^[20], highlighting the role of curriculum-based education and clinical training in shaping daily oral care behaviors.

Interdental cleaning practices also differed significantly. Dental students demonstrated higher flossing rates compared with medical students ($P = 0.015$). This observation aligns with the findings of Li et al.^[20], who reported better oral health practice among dental undergraduates. Additionally, evidence from a network meta-analysis conducted by Kotsakis et al.^[21] confirmed that interdental cleaning methods significantly reduce clinical indices of inflammation, supporting the importance of incorporating these practices into routine oral hygiene.

Preventive dental attendance was markedly higher among dental students. Regular biannual visits were significantly more common in the dental group ($P = 0.001$). This result is consistent with international comparative studies demonstrating that dental students are more likely to seek preventive care than medical students^[15]. Such differences may reflect increased awareness of oral diseases and early diagnosis principles emphasized in dental curricula.

Self-perceived oral malodor was reported less frequently among dental students than medical students ($P = 0.001$). Similar studies have documented varying prevalence rates of halitosis among dental populations. Hasan^[22] and Setia et al.^[23] identified significant associations between oral hygiene practices and self-perceived halitosis ($P < 0.01$). These findings suggest that improved hygiene practices may contribute to reduced perception of oral malodor.

Overall, the results of this study indicate that dental students demonstrate superior oral health knowledge and preventive practices compared with medical students. This pattern is consistently supported by prior comparative research^[9,15,21–27]. The findings suggest that specialized dental training is associated with better oral health competencies. However, as this is a cross-sectional study, causal inferences cannot be definitively drawn; longitudinal studies are needed to confirm the direct impact of curriculum changes on student behaviors. The findings highlight the need to strengthen oral health education within medical curricula to reduce knowledge–practice gaps and promote interdisciplinary oral health awareness.

Several limitations must be acknowledged in this study. First, the reliance on self-reported data introduces the potential for recall bias and social desirability bias, which may affect the accuracy of the reported responses. Second, the study was conducted at a single institution (Herat University), which limits the generalizability of the findings to other settings and populations. Third, the absence of clinical oral examinations means that actual oral health status could not be objectively assessed, and findings are based solely on self-reported behaviors and perceptions. Fourth, important demographic and socioeconomic variables such as socioeconomic status, place of residence, parental education level, and access to dental care services were not collected, resulting in potential unmeasured confounding. Fifth, although the questionnaire was adapted from previously validated instruments and underwent expert review to establish content validity, its internal consistency reliability (e.g., Cronbach's alpha) was not assessed in the present study. Finally, the study included only male students, which further limits the generalizability of the findings. Future research should address these limitations by incorporating clinical assessments, evaluating the psychometric properties of the questionnaire in the local population, and including more diverse, multi-center study populations.

5. Conclusion and Recommendations

5.1 Conclusion

This study assessed oral health knowledge, attitudes, and practices among dental and medical students at Herat University. Dental students had higher knowledge levels and more positive attitudes, likely due to their specialized training. However, shortcomings in proper oral health practices were observed in both groups, particularly among medical students. The findings suggest that improving and better integrating preventive oral health education into undergraduate programs may potentially contribute to enhancing future healthcare professionals' preparedness, which could in turn support improved community oral health outcomes.

5.2 Recommendations

To improve oral health outcomes, undergraduate curricula for both medical and dental students at Herat University should place greater emphasis on preventive care, early detection of oral diseases, and appropriate referral practices, while encouraging dental students to model consistent personal oral health behaviors. Collaborative initiatives, such as joint workshops and community outreach programs, can further promote oral health awareness. Future research should use longitudinal and multi-institutional designs, include clinical oral examinations alongside surveys for more accurate data, and explore barriers that prevent students from translating knowledge into daily oral health practices.

Conflict of Interest

There are no conflicts of interest.

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