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Oral Health Status, Awareness, and Hygiene Practices among Medical and Nursing Students

Divya Sahu, Trishal Sandeep Dandekar, Rohit David

ABSTRACT

Introduction: Oral health is a vital component of overall health and well-being, yet it remains one of the most neglected aspects of preventive healthcare in India. Poor oral hygiene practices contribute significantly to dental caries, periodontal disease, and systemic health risks. This study aims to evaluate oral health status, oral hygiene practices, and oral health awareness among undergraduate healthcare trainees in Rajnandgaon, Chhattisgarh.

Results: Among 386 participants, 98.96% recognized the link between oral and systemic health, and 85.23% demonstrated a positive oral health attitude (OHVS score >36). Overall, 67.1% brushed twice daily, 73.1% used soft-bristled toothbrushes, 73.3% used fluoride toothpaste, and 94.8% practiced daily tongue cleaning. However, 34.9% never flossed, 31.9% did not use any interdental cleaning aid, and 33.9% had never visited a dentist. B.Sc. Nursing students exhibited significantly better oral hygiene practices than MBBS students across most practice indicators. Female students demonstrated superior oral hygiene behaviors, including twice-daily brushing (72.4% vs. 46.2%) and use of soft toothbrushes (77.3% vs. 56.4%), whereas tobacco use (6.4% vs. 1.0%) and alcohol consumption (9.0% vs. 0.6%) were significantly higher among males ($p<0.05$).

Conclusion: Undergraduate medical and nursing students in Rajnandgaon showed satisfactory oral health knowledge and predominantly positive attitudes (85.23% positive OHVS score), with favorable practices including twice-daily brushing (67.1%), near-universal toothbrush use (98.96%), and regular tongue cleaning (94.82%). However, key gaps persisted: 34.97% never flossed, only 14.8% used interdental aids, 17.88% were unsure of their toothpaste's fluoride content, and 33.94% had never visited a dentist. B.Sc. Nursing students outperformed MBBS students on nine of ten practice variables, and females outperformed males across all domains, while males showed higher tobacco (6.4% vs. 1.0%) and alcohol use (9.0% vs. 0.6%). These findings highlight the need for structured, skills-based oral health education and routine dental screening within undergraduate curricula to close the knowledge-practice gap and prepare future providers as effective preventive health advocates.

Keywords: oral health, dental hygiene, health care professionals

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INTRODUCTION

Oral health is a vital component of overall health and well-being, yet it remains one of the most neglected aspects of preventive healthcare in India. Poor oral hygiene practices contribute significantly to dental caries, periodontal disease, and systemic health risks.[1,2]The oral cavity is a recognized site of infection and proper oral hygiene has been shown to prevent the majority of common oral diseases .[3] Dental carries and periodontal problems are due to poor oral hygiene practices.[4,5]

The current trends establishing the links between systemic and oral health urge one and all to maintain complete oral wellbeing rather than the ignorance, which is commonly prevailing in the Indian society.[1] Oral hygiene is further compromised by unhealthy habits like tobacco use and lack of dental specialist care.[6] So World Health Organization (WHO) has set the goals for the year 2020 as Recommended Oral Self Care (ROSC) which includes tooth brushing more than once a day, lesser consumption of sugar containing snacks once daily or rarely and regular use of fluoride containing toothpaste. According to the World Health Organization (WHO), "Promotion of oral health is a cost-effective strategy to reduce the burden of oral disease and maintain oral health and quality of life.[7]

Despite the changing patterns of oral diseases, oral health awareness, dental knowledge, and positive health attitudes among the general public remain limited, and healthy oral hygiene habits continue to be infrequently practiced. Previous studies on oral health habits, knowledge and attitudes of the adult population have been carried out in urban areas of some provinces. [8-11] um disease and oral infections can trigger inflammation, allow harmful bacteria into the bloodstream, and, in severe cases, even lead to direct infection of heart tissue. Together, these effects can contribute to serious, sometimes life-threatening, cardiovascular conditions. [12]Oral disease poses a significant public health burden for many countries and affects individuals throughout their lifetime, causing pain, disfigurement, impairment of function and a reduced quality of life [13]

Healthcare trainees, including medical and nursing students, serve as an important segment of the future workforce. Their personal oral health attitudes and hygiene practices can significantly influence how they later promote preventive care among patients. Despite an abundance of theoretical knowledge provided during their training, studies have indicated variability in the practical application of proper oral hygiene practices.

Undergraduate medical and nursing students should be aware of oral health and dental hygiene as they are the future healthcare providers on whom the health of the nation will depend. Inter-professional research also suggests that awareness and attitudes toward oral healthcare vary across medical, nursing, and dental student groups, underscoring the need for targeted education.[14] Published literature on oral health awareness and hygiene practices among healthcare trainees in India is limited, and comparative data between medical and nursing students is scarce. Given their future role in health promotion and patient education, understanding their oral health knowledge, attitudes, and practices is important. Differences in curriculum exposure and healthcare training may also influence oral health behaviors between these groups. Therefore, this study was conducted to assess and compare oral health awareness, hygiene practices, and dental health problems among undergraduate medical and nursing students in Rajnandgaon, Chhattisgarh

Aims and Objectives:

Aim:

To evaluate oral health status, oral hygiene practices, and oral health awareness among undergraduate healthcare trainees.

Objectives:

Primary objective:

To assess and compare the oral health status, oral hygiene practices, and oral health awareness among undergraduate medical and nursing students.

Secondary objectives:

1. To Identify Socio-Demographic and Behavioral Factors influencing hygiene practices among healthcare trainees
2. To Assess Awareness of Oral Health Risks and Preventive Strategies adopted by

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healthcare trainees by using Oral health value scale (OHVS)

Material and Method

Study Design and type -

A cross-sectional observational study was conducted to assess oral health attitudes and hygiene practices among undergraduate medical and nursing students.

Study setting -

Department of Community Medicine of Bharat Ratan Shree Atal Bihari Vajpyee Memorial Medical College , Rajnandgaon, Chhattisgarh.

Study Area -

The study was carried out under the Department of Community Medicine, Bharat Ratan Shree Atal Bihari Vajpyee Memorial Medical College.

Rajnandgaon, Chhattisgarh, which is a tertiary care medical hospital and teaching institute. The department of community medicine is actively involved in undergraduate teaching, community-based training, and public health research, providing an appropriate academic and field-based environment for conducting studies related to health attitudes and practices among medical and nursing students.

Study population -

The study population consisted of undergraduate MBBS students and undergraduate B.Sc. Nursing students, enrolled from the first year to the final year in the selected institutions during the study period. Eligibility for participation included students pursuing MBBS or B.Sc. Nursing who were willing to participate in the study and had access to a smartphone with internet connectivity, as data collection was carried out using an online platform.

Students who were unwilling to participate or did not have access to a smartphone were excluded from the study.

Sampling type -

A total population (census) sampling method was used for the selection of study participants. All eligible undergraduate MBBS and B.Sc. Nursing students who fulfilled the inclusion criteria and provided informed consent during the study period were invited to participate, without further selection or exclusion. This approach was chosen to maximize sample representativeness within the two student groups and to allow a comprehensive assessment of oral health attitudes and practices among medical and nursing undergraduates.

Study duration -

The study was conducted over a period of August 2025 to November 2025, including questionnaire preparation, pilot testing, data collection, and analysis.

Study technique -

Data were collected using a pre-designed, pre-tested, semi-structured standardized questionnaire, which was administered to the study participants through Google Forms. An electronic informed consent was incorporated at the beginning of the questionnaire, clearly explaining the purpose of the study and assuring confidentiality. Participation was entirely voluntary, and responses were recorded anonymously to encourage honest and unbiased reporting.

Study tools -

The study utilized two tools for data collection. A pre-designed and pre-tested demographic questionnaire was used to obtain baseline information regarding the participants' age, gender, course of study (MBBS or B.Sc. Nursing), and year of study.

Oral health attitude was assessed using the Oral Health Values Scale (OHVS), a standardized and validated 12-item instrument designed to evaluate the value individuals place on oral health, comprising four subscales: professional dental care, appearance and health, flossing, and retaining natural teeth. Responses were recorded on a five-point Likert scale ranging from strongly disagree (1) to strongly agree (5). Six negatively worded items were reverse-scored prior to analysis. Individual item scores were summed to yield a total OHVS score ranging from 12 to 60, with higher scores reflecting a more positive oral health attitude.As no universally validated cutoff exists for classifying OHVS scores into positive and negative attitude categories, the midpoint of the total score range (36) was used for this purpose, which may differ from cutoffs used in other studies.

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Ethical Considerations

The study protocol was reviewed and approved by the Institutional Research Committee (IRC) and the Institutional Ethics Committee (IEC) of B.R.L.S.A.B.V.M. Medical College, Rajnandgaon. IRC approval was obtained on 08/08/2025, and ethical clearance was granted with IEC approval number 96/ IECGMCRJN/ 2025 dated 13/08/2025. Written informed consent was obtained from all participants prior to data collection, and confidentiality of the collected information was maintained throughout the study.

Data Analysis

Data collected was entered into Microsoft excel spread sheet and was statistical analyzed using Epi Info

Results

This table shows the demographic characteristics of the study participants. A total of 386 subjects were included in the study. Among them, the majority were females (308; 80%), while males constituted 78 (20%) of the participants. With regard to the course of study, B.Sc. Nursing students formed the larger proportion (221; 57%), whereas M.B.B.S. students accounted for 165 (43%) of the study population. This indicates a female and B.Sc. Nursing students shows higher participation in the study. *(Table 1)*

Table 1: Demographic characteristics of the study subjects.

Characteristics		**N**	**%**
Gender			
Female		308	80%
Male		78	20%
Study Participants			
M.B.B.S. students		165	43%
B.Sc. Nursing students		221	57%
Course	***Year of Study***	***N***	***%***
MBBS	***1Year***	***54***	***32.72***
	2 Year	***8***	***4.85***
	3 Year	***65***	***39.40***
	4 Year	***38***	***23.03***
B.Sc Nursing	***1 Year***	***65***	***29.42***
	2 Year	***51***	***23.08***
	3 Year	***53***	***24***
	4Year	***52***	***23.50***

Oral Health Knowledge:

Overall, oral health knowledge was satisfactory among both MBBS and B.Sc. Nursing students. Nearly all participants recognized the relationship between oral and systemic health (98.96%) and correctly identified bleeding gums as a sign of poor oral hygiene (94.30%). Most respondents knew that teeth should be brushed twice daily (82.38%), identified fluoridated toothpaste as a source of fluoride (79.27%), and recognized the role of flossing in removing food particles (85.75%). Approximately two-thirds (65.03%) correctly associated tobacco use with multiple oral diseases, while 79.79% identified all WHO-recommended oral self-care components. Awareness of the association between poor oral hygiene and cardiovascular health was reported by 67.10% of participants. Nursing students demonstrated higher awareness regarding the use of soft-bristled toothbrushes (86.88% vs. 60.61%) and the link between oral hygiene and cardiovascular health (71.49% vs. 61.21%), whereas MBBS students showed better knowledge regarding fluoride-containing toothpaste (85.45% vs. 74.66%) and WHO-recommended oral self-care practices (83.64% vs. 76.92%). Despite generally good knowledge, gaps remained regarding fluoride-related benefits and the systemic implications of poor oral hygiene.(Table 2) Chi-square test (#) was used for variables with expected cell counts ≥5 in all cells Responses to the Oral Health Value Scale (OHVS) among 386 study participants. Based on the midpoint of the total OHVS score range (12–60), participants were classified as having a positive or negative oral health attitude. Of the 386 participants who completed the OHVS, the majority (n = 329, 85.23%) demonstrated a positive oral health attitude (score > 36), while 57 (14.77%) demonstrated a negative oral health attitude (score ≤ 36) . (Table 2)

Table 2 : Oral Health Knowledge – MBBS vs. B.Sc. Nursing Students

question	Response	MBBS N (%)	B.Sc. Nursing N (%)	Total N (%)
1. Do you believe oral health impacts systemic health? (MBBS n=165; Nursing n=221)	Yes	165 (100.00)	217 (98.19)	382 (98.96)
	No	0 (0.00)	4 (1.81)	4 (1.04)
2. Which of the following is a common sign of poor oral hygiene? (MBBS n=165; Nursing n=221)	Fresh Breath	3 (1.82)	5 (2.26)	8 (2.07)
	Bleeding Gums	157 (95.15)	207 (93.67)	364 (94.30)
	White Teeth	3 (1.82)	2 (0.90)	5 (1.30)
	Strong Enamel	2 (1.21)	7 (3.17)	9 (2.33)
3. How often should one ideally brush their teeth? (MBBS n=165; Nursing n=221)	Once a day	25 (15.15)	27 (12.22)	52 (13.47)
	Twice a day	139 (84.24)	179 (81.00)	318 (82.38)
	After every meal	1 (0.61)	11 (4.98)	12 (3.11)
	Once a week	0 (0.00)	4 (1.81)	4 (1.04)
4. Which of these contains fluoride? (MBBS n=165; Nursing n=221)	Fluoridated toothpaste	141 (85.45)	165 (74.66)	306 (79.27)
	Don't know	15 (9.09)	17 (7.69)	32 (8.29)
	Herbal toothpaste	8 (4.85)	29 (13.12)	37 (9.59)
	Neem toothpaste	1 (0.61)	10 (4.52)	11 (2.85)
5. What is the role of flossing in oral hygiene? (MBBS n=165; Nursing n=221)	Removes food particles	144 (87.27)	187 (84.62)	331 (85.75)
	Strengthens teeth	16 (9.70)	29 (13.12)	45 (11.66)
	Whitens teeth	4 (2.42)	3 (1.36)	7 (1.81)
	No role	1 (0.61)	2 (0.90)	3 (0.78)
6. Which oral diseases are linked to tobacco use? (MBBS n=165; Nursing n=221)	All of the above	100 (60.61)	151 (68.33)	251 (65.03)
	Oral cancer	59 (35.76)	67 (30.32)	126 (32.64)
	Dental caries	4 (2.42)	2 (0.90)	6 (1.55)
	Gum disease	2 (1.21)	1 (0.45)	3 (0.78)
7. What is the WHO-recommended oral self-care components? (MBBS n=165; Nursing n=221)	All of the above	138 (83.64)	170 (76.92)	308 (79.79)
	Brushing twice daily	23 (13.94)	34 (15.38)	57 (14.77)
	Use of fluoride toothpaste	3 (1.82)	11 (4.98)	14 (3.63)
	Regular dental visits	1 (0.61)	6 (2.71)	7 (1.81)
8. Can poor dental hygiene affect cardiovascular health? (MBBS n=165; Nursing n=221)	Yes	101 (61.21)	158 (71.49)	259 (67.10)
	Not sure	50 (30.30)	47 (21.27)	97 (25.13)
	No	14 (8.48)	16 (7.24)	30 (7.77)
	Medium	42 (25.45)	26 (11.76)	68 (17.62)

9. Which type of toothbrush is generally recommended by dentists? (MBBS n=165; Nursing n=221)	***Soft***	***100 (60.61)***	***192 (86.88)***	***292 (75.65)***
	Don't know	***18 (10.91)***	***3 (1.36)***	***21 (5.44)***
	Hard	***2 (1.21)***	***0 (0.00)***	***2 (0.52)***
	Electric	***3 (1.82)***	***0 (0.00)***	***3 (0.78)***
10. Why is fluoride important for dental health? (MBBS n=165; Nursing n=221)	***Prevents tooth decay***	***115 (69.70)***	***159 (71.95)***	***274 (70.98)***
	Causes discoloration	***11 (6.67)***	***1 (0.45)***	***12 (3.11)***
	Strengthens gum	***23 (13.94)***	***56 (25.34)***	***79 (20.47)***
	No known benifit	***16 (9.70)***	***5 (2.26)***	***21 (5.44)***

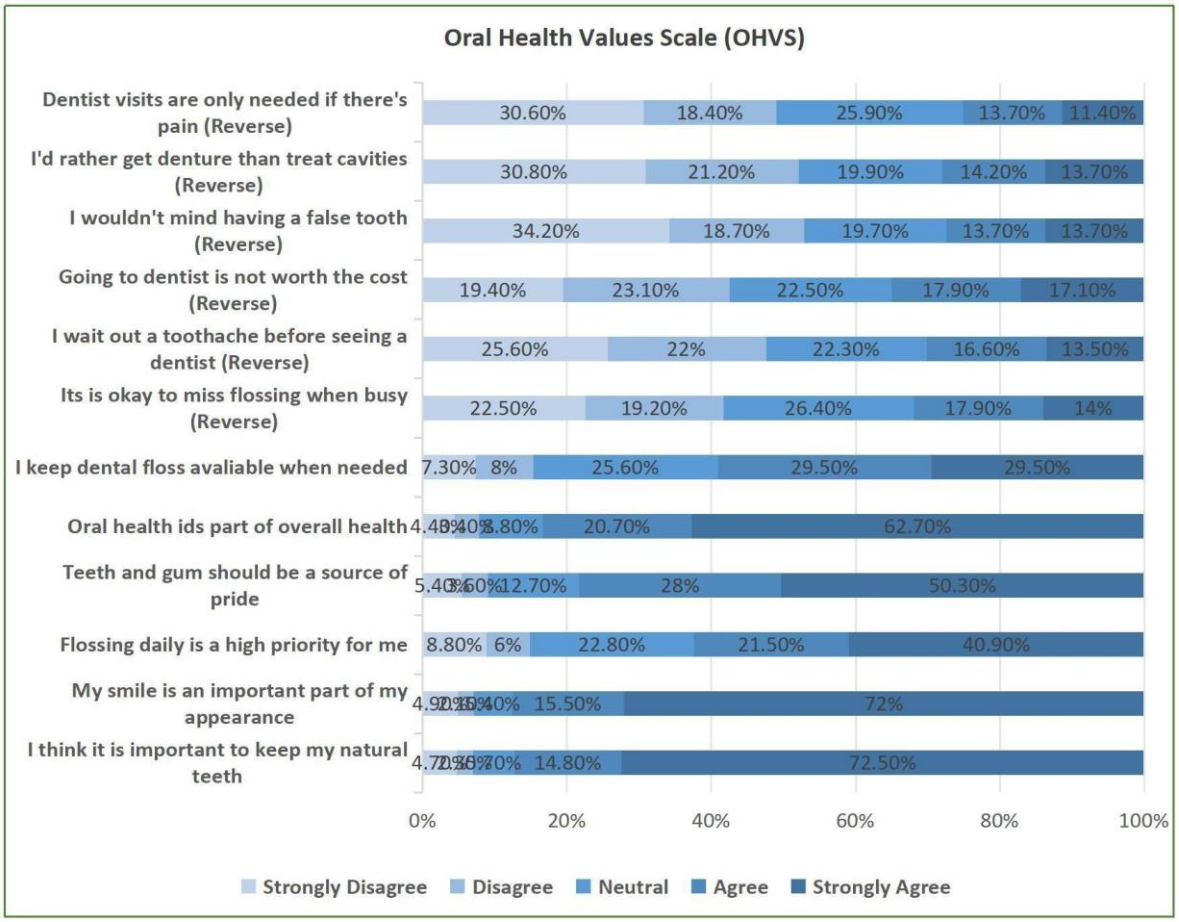
On comparing oral health attitudes between the two groups, a positive oral health attitude (OHVS score >36) was observed in 137 (83.03%) MBBS students and 192 (86.88%) B.Sc. Nursing students, while a negative oral health attitude (OHVS score ≤36) was observed in 28 (16.97%) MBBS students and 29 (13.12%) B.Sc. Nursing students (Table X). Although the proportion of students with a positive oral health attitude was slightly higher among B.Sc Nursing students compared to MBBS students, this difference was not statistically significant ($\chi^2(1, N=386) = 0.826$, $p = 0.363$). (Table 3)

Table 3 : Oral Health Attitude of Study Subjects.

OHVS	**N**	**%**
Positive Oral Health Attitude (>36)	329	85.23
Negative Oral Health Attitude (≤36)	57	14.77

Regarding oral hygiene practices, most participants agreed that they keep dental floss available when needed, reflecting favorable self-care behavior. For negatively framed (reverse-coded) statements, such as "dentist visits are only needed if there is pain," "going to the dentist is not worth the cost," and "it is okay to miss flossing when busy," a considerable proportion of respondents disagreed or strongly disagreed, suggesting appropriate attitudes toward regular dental visits and preventive care. However, a noticeable percentage of neutral responses was observed for certain items, indicating some degree of ambivalence in specific aspects of oral health behavior. In summary, the OHVS results reveal that most participants demonstrated a positive and preventive-oriented attitude towards oral health, though scope remains for strengthening attitudes related to routine dental visits and consistent flossing practices. (Figure 1)

Figure 1: Horizontal Component Bar Graph showing Oral Health Attitude using Oral Health Value Scale (OHVS) (n=386) [15]



Oral Hygiene Practices:

Overall, the participants demonstrated generally favorable oral hygiene practices. Two-thirds of the students (67.10%) reported brushing their teeth twice daily, with a higher proportion among nursing students than MBBS students (76.47% vs. 54.55%). Toothbrush use was nearly universal (98.96%), and 73.06% reported using a soft-bristled toothbrush. Most participants (68.13%) replaced their toothbrush every three months, and 59.33% followed the recommended circular brushing technique. The use of interdental cleaning aids was reported by 68.13% of students, with interdental brushes being the most commonly used aid (33.68%). However, 31.87% did not use any oral cleaning method, and 34.97% reported never flossing. Regular tongue cleaning was widely practiced, with 94.82% cleaning their tongue daily. Most students (73.32%) were aware that their toothpaste contained fluoride, although 17.88% were unsure. The prevalence of tobacco and alcohol use was low, reported by 2.07% and 2.33% of participants, respectively. Despite generally good oral hygiene practices, dental service utilization was suboptimal. One-third of students (33.94%) had never visited a dentist, and 35.75% reported no previous dental visit. Routine dental check-ups were more common among nursing students than MBBS students (36.20% vs. 15.76%). Family members (42.08%) and the internet (32.99%) were the major sources of oral health information. Overall, nursing students exhibited better oral hygiene practices than MBBS students across several indicators, including brushing frequency, toothbrush selection, oral hygiene cleaning, and preventive dental visits.(Table 5)

Table 5: Oral Hygiene Practices – MBBS vs. B.Sc. Nursing Students

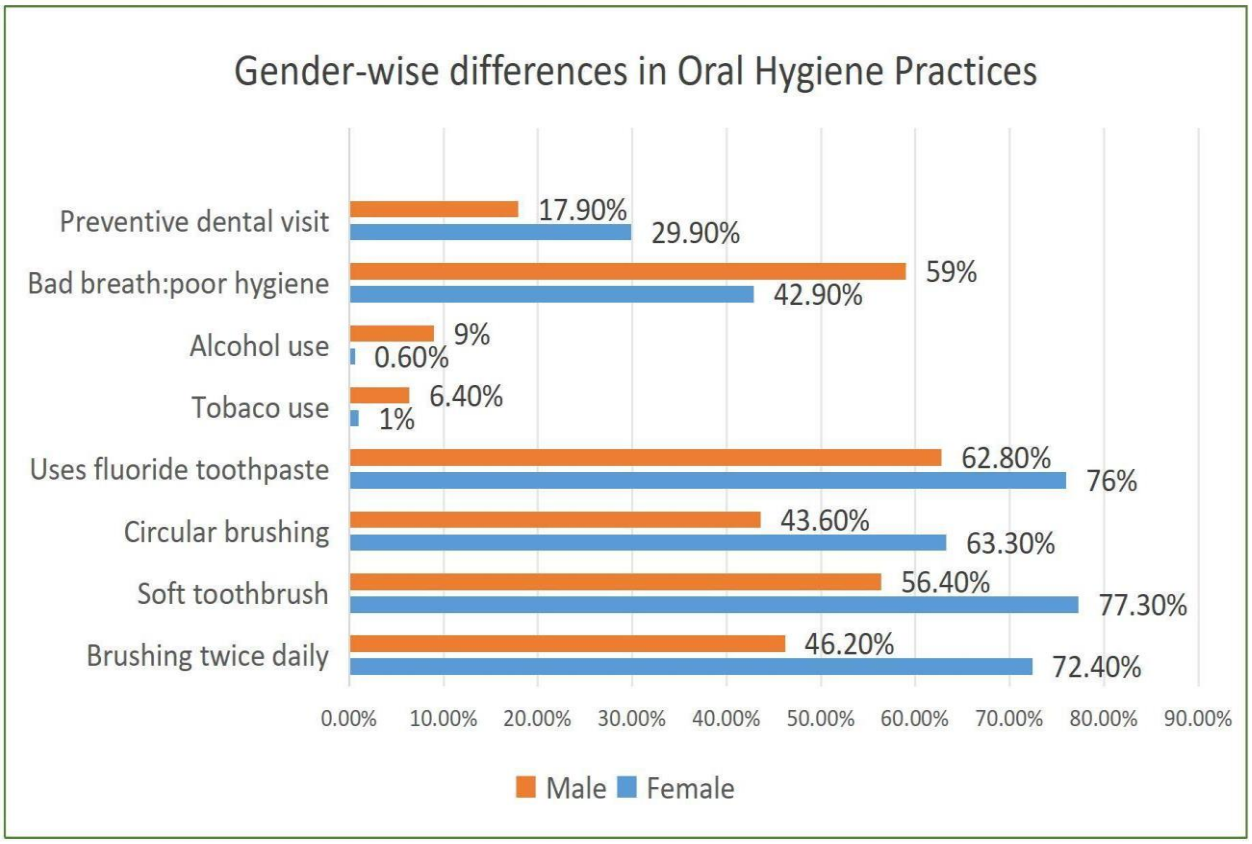
Question	Response	MBBS N (%)	B.Sc. Nursing N (%)	Total N (%)
1. Frequency of brushing your teeth in a day (MBBS n=165; Nursing n=221)	Once	72 (43.64)	43 (19.46)	115 (29.79)
	After every meal	3 (1.82)	9 (4.07)	12 (3.11)
	Twice	90 (54.55)	169 (76.47)	259 (67.10)
2. How do you clean your teeth? (MBBS n=165; Nursing n=221)	Toothbrush	162 (98.18)	220 (99.55)	382 (98.96)
	FInger	3 (1.82)	0 (0.00)	3 (0.78)
	Chewing stick/Miswack	0 (0.00)	1 (0.45)	1 (0.26)
3. Type of toothbrush used (MBBS n=165; Nursing n=221)	Medium	61 (36.97)	38 (17.19)	99 (25.65)
	Soft	99 (60.00)	183 (82.81)	282 (73.06)
	Don't know	4 (2.42)	0 (0.00)	4 (1.04)
	Hard	1 (0.61)	0 (0.00)	1 (0.26)
4. Frequency of changing your toothbrush (MBBS n=165; Nursing n=221)	Once in 3 months	101 (61.21)	162 (73.30)	263 (68.13)
	When useless	24 (14.55)	22 (9.95)	46 (11.92)
	Once in 6 months	37 (22.42)	36 (16.29)	73 (18.91)
	In a year	3 (1.82)	1 (0.45)	4 (1.04)
5. Method of tooth brushing (MBBS n=165; Nursing n=221)	Circular	77 (46.67)	152 (68.78)	229 (59.33)
	Horizontal	65 (39.39)	46 (20.81)	111 (28.76)
	Vertical	23 (13.94)	23 (10.41)	46 (11.92)
6. Use of inter-dental cleaning aid (MBBS n=165; Nursing n=221)	None	72 (43.64)	51 (23.08)	123 (31.87)
	Floss	35 (21.21)	46 (20.81)	81 (20.98)
	Inter-dental brush	29 (17.58)	101 (45.70)	130 (33.68)
	Tooth pick	29 (17.58)	23 (10.41)	52 (13.47)
7. How often do you floss each week? (MBBS n=165; Nursing n=221)	1-2 times	63 (38.18)	92 (41.63)	155 (40.16)
	Never	71 (43.03)	64 (28.96)	135 (34.97)
	>5 times	12 (7.27)	35 (15.84)	47 (12.18)
	3-4 times	19 (11.52)	30 (13.57)	49 (12.69)
8. How often do you clean your tongue with tongue cleaner? (MBBS n=165; Nursing n=221)	Everyday	154 (93.33)	212 (95.93)	366 (94.82)
	Occasionally	8 (4.85)	4 (1.81)	12 (3.11)
	Never	2 (1.21)	4 (1.81)	6 (1.55)
	When mouth smells	1 (0.61)	1 (0.45)	2 (0.52)
9. Do you use toothpaste for brushing? (MBBS n=165; Nursing n=221)	Yes	162 (98.18)	220 (99.55)	382 (98.96)
	No	3 (1.82)	1 (0.45)	4 (1.04)
10. Does your toothpaste contain fluoride? (MBBS n=165; Nursing n=221)	Don't know	39 (23.64)	30 (13.57)	69 (17.88)
	Yes	109 (66.06)	174 (78.73)	283 (73.32)
	No	17 (10.30)	17 (7.69)	34 (8.81)

11. Do you use any tobacco products? (MBBS n=165; Nursing n=221)	No	160 (96.97)	218 (98.64)	378 (97.93)
	Yes	5 (3.03)	3 (1.36)	8 (2.07)
12. Do you consume alcohol? (MBBS n=165; Nursing n=221)	No	158 (95.76)	219 (99.10)	377 (97.67)
	Yes	7 (4.24)	2 (0.90)	9 (2.33)
13. What do you think is the cause of bad breath? (MBBS n=165; Nursing n=221)	Poor brushing/flossing	49 (29.70)	120 (54.30)	169 (43.78)
	Residual food in mouth/food stuck between teeth	100 (60.61)	78 (35.29)	178 (46.11)
	Don't know	10 (6.06)	13 (5.88)	23 (5.96)
	Hormonal dysfuntion	6 (3.64)	10 (4.52)	16 (4.15)
14. Frequency of changing Brand of Toothpaste (MBBS n=165; Nursing n=221)	Once in 6 month	29 (17.58)	28 (12.67)	57 (14.77)
	Never	49 (29.70)	55 (24.89)	104 (26.94)
	Once in Year	36 (21.82)	26 (11.76)	62 (16.06)
	Every Month	13 (7.88)	34 (15.38)	47 (12.18)
	Once in 3 month	38 (23.03)	78 (35.29)	116 (30.05)
15. When was your last visit to the dentist? (MBBS n=165; Nursing n=221)	More than 2 year	37 (22.42)	21 (9.50)	58 (15.03)
	Never visited	63 (38.18)	68 (30.77)	131 (33.94)
	0-6 months ago	30 (18.18)	61 (27.60)	91 (23.58)
	1-2 years ago	20 (12.12)	27 (12.22)	47 (12.18)
	6-12 months ago	15 (9.09)	44 (19.91)	59 (15.28)
16. What was the reason for your last dental visit? (MBBS n=165; Nursing n=221)	Didn't visit	65 (39.39)	73 (33.03)	138 (35.75)
	Treatment	35 (21.21)	21 (9.50)	56 (14.51)
	Routine checknup	26 (15.76)	80 (36.20)	106 (27.46)
	Pain	17 (10.30)	22 (9.95)	39 (10.10)
	Consultation	22 (13.33)	25 (11.31)	47 (12.18)
17. Did you experience toothache in the past 12 months? (MBBS n=165; Nursing n=221)	Yes	52 (31.52)	79 (35.75)	131 (33.94)
	No	113 (68.48)	142 (64.25)	255 (66.06)
18. How often did you have dental problems in the past 12 months? (MBBS n=165; Nursing n=221)	Once in a year	28 (16.97)	36 (16.29)	64 (16.58)
	Never	110 (66.67)	140 (63.35)	250 (64.77)
	Once in 6 months	17 (10.30)	23 (10.41)	40 (10.36)
	Once a month	10 (6.06)	22 (9.95)	32 (8.29)
19. What is your source of oral hygiene information? (MBBS n=164; Nursing n=221)	Internet	64 (39.02)	63 (28.51)	127 (32.99)
	TV	17 (10.37)	6 (2.71)	23 (5.97)
	Dental clinic	17 (10.37)	35 (15.84)	52 (13.51)
	Family	58 (35.37)	104 (47.06)	162 (42.08)
	Community health camps	8 (4.88)	13 (5.88)	21 (5.45)

Gender-wise differences in oral hygiene practices among the study participants. Overall, female participants demonstrated better oral hygiene practices compared to males across most parameters.

A higher proportion of females reported brushing twice daily (72.4%) compared to males (46.2%). Similarly, the use of a soft toothbrush was more common among females (77.3%) than males (56.4%). Circular brushing technique was practiced by a greater percentage of females (63.3%) compared to males (43.5%). Use of fluoride-containing toothpaste was also higher among females (76.0%) than males (62.8%). With respect to dental service utilization, preventive dental visits were reported more frequently by females (29.9%) than males (17.9%). In contrast, adverse oral hygiene–related factors such as bad breath due to poor oral hygiene were reported more commonly among males (59%) than females (42.9%).Risk behaviors showed a clear gender disparity. Tobacco use (6.4% vs. 1.0%) and alcohol use (9.0% vs. 0.6%) were substantially higher among males compared to females. In summary, the findings indicate that females exhibit more favorable oral hygiene practices and preventive behaviors, whereas males show higher prevalence of deleterious habits, highlighting the need for targeted oral health education and behavior change interventions, particularly among male participants. *(Figure 2)*

Figure 2: Horizontal Grouped Bar Graph showing gender-wise differences in Oral Health Practices



B.Sc. Nursing students demonstrated significantly better knowledge on two of the three significant items – they were more likely to correctly identify a soft-bristled toothbrush as the dentist-recommended type (OR = 0.23, indicating MBBS students had only about a quarter the odds of nursing students of selecting the correct answer) and more likely to acknowledge a link between poor dental hygiene and cardiovascular health (OR = 0.63). MBBS students, conversely, were more likely to correctly identify fluoridated toothpaste as fluoride-containing (OR = 1.99). (Table 6)

Table 6 : Association of Oral Health Knowledge - M.B.B.S vs B.Sc Nursing Students

S.n	Questions	Modal Response	MBBS Modal n (%)	MBBS Other n (%)	Nursing Modal n (%)	Nursing Other n (%)	Test	P-value	OR (95% CI)
1	Which of these contains fluoride?	Fluoridated toothpaste	**141 (85.45)**	24 (14.55)	**165 (74.66)**	56 (25.34)	#	**0.014**	1.99 (1.18–3.38)
2	Can poor dental hygiene affect cardiovascular health?	Yes	**101 (61.21)**	64 (38.79)	**158 (71.49)**	63 (28.51)	#	**0.044**	0.63 (0.41–0.97)
3	Which toothbrush type is recommended by dentists?	Soft	**100 (60.61)**	65 (39.39)	**192 (86.88)**	29 (13.12)	#	**<0.001**	0.23 (0.14–0.38)

*# Chi-square test used (all expected cell counts ≥ 5). * Fisher's exact test used (minimum expected cell count < 5). "Modal" = Correct response across the full sample; "Other" = all remaining response options combined. OR = Odds Ratio (MBBS relative to B.Sc. Nursing, for the modal response).*

A clearer pattern emerged for oral hygiene practices . On 9 of the 10 significant practice items, B.Sc. Nursing students showed more favorable behavior than MBBS students – they were more likely to brush twice daily, use a soft toothbrush, change their toothbrush within 3 months, use the recommended circular brushing technique, use an inter-dental cleaning aid, use fluoride toothpaste, and abstain from alcohol (all OR < 1, indicating lower odds among MBBS students of the favorable/modal behavior). The single reversal was for "perceived cause of bad breath," where MBBS students were nearly three times more likely than nursing students to attribute it correctly to residual food (OR = 2.82) (Table 7)

Table 7 : Association of Oral Health Practice - M.B.B.S vs B.Sc Nursing Students

S.n	Questions	Modal Response	MBBS Modal n (%)	MBBS Other n (%)	Nursing Modal n (%)	Nursing Other n (%)	Test	p-value	OR (95% CI)
1	Frequency of brushing teeth/day	Twice	90 (54.55)	**75 (45.45)**	169 (76.47)	**52 (23.53)**	#	<0.001	**0.37 (0.24–0.57)**
2	Type of toothbrush used	Soft	99 (60.00)	**66 (40.00)**	183 (82.81)	**38 (17.19)**	#	<0.001	**0.31 (0.20–0.50)**
3	Frequency of changing toothbrush	Once in 3 months	101 (61.21)	**64 (38.79)**	162 (73.30)	**59 (26.70)**	#	0.016	**0.58 (0.37–0.89)**
4	Method of tooth brushing	Circular	77 (46.67)	**88 (53.33)**	152 (68.78)	**69 (31.22)**	#	<0.001	**0.40 (0.26–0.60)**
5	Use of inter-dental cleaning aid	Inter-dental brush	29 (17.58)	**136 (82.42)**	101 (45.70)	**120 (54.30)**	#	<0.001	**0.25 (0.16–0.41)**
6	Does toothpaste contain fluoride?	Yes	109 (66.06)	**56 (33.94)**	174 (78.73)	**47 (21.27)**	#	0.008	**0.53 (0.33–0.83)**
7	Do you consume alcohol?	No	158 (95.76)	**7 (4.24)**	219 (99.10)	**2 (0.90)**	*	0.042	**0.21 (0.04–1.01)**
8	Perceived cause of bad breath	Residual food / food stuck between teeth	100 (60.61)	**65 (39.39)**	78 (35.29)	**143 (64.71)**	#	<0.001	**2.82 (1.86–4.28)**
9	Frequency of changing toothpaste brand	Once in 3 months	38 (23.03)	**127 (76.97)**	78 (35.29)	**143 (64.71)**	#	0.013	**0.55 (0.35–0.87)**
10	Source of oral hygiene information	Family	58 (35.37)	**106 (64.63)**	104 (47.06)	**117 (52.94)**	#	0.028	**0.62 (0.41–0.93)**

 # Chi-square test used (all expected cell counts ≥ 5). * Fisher's exact test used (minimum expected cell count < 5). "Modal" = Correct response across the full sample; "Other" = all remaining response options combined. OR = Odds Ratio (MBBS relative to B.Sc. Nursing, for the modal response).

The gender-wise comparison of oral hygiene practices, habits, and dental service utilization among the study participants. Statistically significant differences were observed between females and males for most attributes. A significantly higher proportion of females brushed their teeth twice daily (72.4%) compared to males (46.2%). Use of a soft toothbrush was also significantly more common among females (77.3%) than males (56.4%). Similarly, circular brushing technique was practiced by more females (63.3%) than males (43.6%). With respect to oral hygiene products, a significantly greater proportion of females reported using fluoride-containing toothpaste (76.0%) compared to males (62.8%). Risk behaviors showed a contrasting pattern. Tobacco use was significantly higher among males (6.4%) than females (1.0%), and alcohol consumption was markedly more prevalent

among males (9.0%) compared to females (0.6%). Regarding knowledge of oral health, poor oral hygiene/residual food as a cause of bad breath was identified by a higher proportion of males (59.0%) than females (42.9%). In terms of dental service utilization, preventive or routine dental visits were significantly more frequent among females (29.9%) than males (17.9%). Overall, the results indicate that female participants exhibited significantly better oral hygiene practices and preventive dental behaviors, whereas male participants had a higher prevalence of deleterious habits such as tobacco and alcohol use, underscoring the need for gender-specific oral health promotion strategies. *(Table 8)*

Table 8 : Association of Gender with Oral Hygiene Practices.

Attributes	Category	Female (n, %)	Male (n, %)	p value
requency of brushing your teeth in a day	Twice	223 (72.4%)	36 (46.2%)	0.001#
	ss than twice	85 (27.6%)	42 (53.8%)	
toothbrush used	Soft	238 (77.3%)	44 (56.4%)	0.002#
	Non-soft	70 (22.7%)	34 (43.6%)	
thod of tooth brushing	Circular	195 (63.3%)	34 (43.6%)	0.0015#
	Non-circular	113 (36.7%)	44 (56.4%)	
es your toothpaste contain fluoride?	Yes	234 (76.0%)	49 (62.8%)	0.01#
	o/Don't know	74 (24.0%)	29 (37.2%)	
se any tobacco products?	Yes	3 (1.0%)	5 (6.4%)	0.01*
	No	305 (99.0%)	73 (93.6%)	
ou consume alcohol?	Yes	2 (0.6%)	7 (9.0%)	0.0003*
	No	306 (99.4%)	71 (91.0%)	
What do you think is the cause of bad breath?	Poor hygiene/ Residual food	132 (42.9%)	46 (59.0%)	0.01#
	Other causes	176 (57.1%)	32 (41.0%)	
What was the reason for your last dental visit?	reventive/ Routine	92 (29.9%)	14 (17.9%)	0.03#
	Problem-based/None	216 (70.1%)	64 (82.1%)	

Chi-square test (#) was used for variables with expected cell counts ≥5 in all cells. Fisher's exact test (*) was used when expected cell counts were <5. All p-values are two-tailed with significance at p < 0.05.

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DISCUSSION

The present study evaluated oral health knowledge, attitudes, and hygiene practices among 386 undergraduate medical (MBBS) and nursing (B.Sc.) students in Rajnandgaon, Chhattisgarh, and revealed generally satisfactory knowledge and positive attitudes alongside identifiable gaps in consistent preventive behavior. Healthcare trainees occupy a uniquely important position as subjects of such research: their personal oral health values and practices directly influence the preventive counseling they will offer patients and communities throughout their professional careers. Overall knowledge was strong across both cohorts, with nearly all participants (98.96%) correctly recognizing the link between oral and systemic health, 94.30% identifying bleeding gums as a sign of poor oral hygiene, and 82.38% aware that teeth should be brushed twice daily. These figures compare favorably with findings by **Verma et al.[1]**, who surveyed 400 students across medical, nursing, engineering, and other undergraduate disciplines at Durg, Chhattisgarh, and reported satisfactory dental hygiene awareness overall, with healthcare students consistently outperforming non-technical peers. Similarly, **Gupta et al.[2]**, in a cross-sectional study of 139 medical students, found that all participants brushed daily and general oral health knowledge was adequate; however, only 30.7% brushed twice a day, revealing a pronounced gap between awareness and practice. In the present study, 67.1% of participants reported brushing twice daily, a rate more than double that of **Gupta et al.[2]** and also exceeding the 36.9% documented in a recent Indian MBBS student survey.This higher rate likely reflects the combined effect of a predominantly female sample and the inclusion of nursing students, who demonstrated markedly superior practices across most indicators, though the knowledge-practice gap identified in both prior studies was nevertheless replicated here in domains such as interdental cleaning and fluoride awareness.

With respect to oral health attitudes, 85.23% of participants demonstrated a positive oral health attitude, as assessed using the Oral Health Values Scale (OHVS) validated by **Edwards et al.[14]**. The proportion of students with a positive attitude (OHVS score >36) did not differ significantly between MBBS students (83.03%) and B.Sc. Nursing students (86.88%; chi-square = 0.826, p = 0.363), indicating uniformly favorable preventive orientation across both cohorts. This finding aligns with **Lay et al.[13]**, who assessed 442 first-year dental, medical, and nursing students at Universitas Indonesia and reported broadly positive oral health attitudes across all three professional groups, though dental students scored higher on specific awareness items than medical and nursing students. The present study extends this interprofessional comparison to the Indian healthcare education context, confirming that attitude scores are comparable between MBBS and nursing cohorts even where significant practice differences exist. Notably, a sizeable proportion of participants in the present study gave neutral responses to OHVS items concerning routine dental visits and regular flossing, indicating residual ambivalence in these specific preventive behaviors despite generally positive overall attitudes. **Yavagal et al.[17]**, in their cross-sectional survey of 365 B.Sc. Nursing students in Davangere, Karnataka, similarly observed that 91.2% believed oral healthcare was an important component of nursing care, yet actual preventive dental visit rates remained low, demonstrating that positive attitudinal endorsements do not automatically translate into consistent preventive action. The OHVS thus proves a useful discriminating instrument, revealing nuanced attitudinal gaps that aggregate knowledge scores alone would not capture. Oral hygiene practices in the present study were generally favorable. Overall, 67.1% of participants brushed twice daily, 73.06% used a soft-bristled toothbrush, 59.33% employed the circular brushing technique recommended by dentists, and 68.13% replaced their toothbrush every three months. Toothbrush use as the primary cleaning tool was near-universal (98.96%), and tongue cleaning was practiced daily by 94.82% of participants. These figures compare favorably with those reported by **Kamble et al.[16]** among 83 first-year MBBS students in Gulbarga, where all students brushed at least once daily but fluoride toothpaste use was extremely limited (13.2%) and 67.4% were unaware of the fluoride content of their toothpaste. In the present study, fluoride awareness was considerably higher, with 73.32% reporting that their toothpaste

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contained fluoride, though 17.88% remained unsure, a gap warranting curricular attention. **Yavagal et al.[17]**, in their Davangere nursing student study, reported 74.2% twice-daily brushing, a figure closely comparable to the 76.47% observed among nursing students in the present study, lending cross-institutional validity to this finding. **Yadav et al.[25]**, studying 409 nursing students in Rajasthan, reported a lower rate of 58% twice-daily brushing, a difference potentially attributable to regional variations in health professional training programs. Across all these samples, however, interdental cleaning remains the most consistently neglected practice: in the present study, 34.97% of participants reported never flossing, and only 14.8% used dedicated interdental cleaning aids. This pattern of low interdental hygiene despite adequate brushing is well-documented in Indian healthcare student populations and reflects the challenge of integrating supplementary oral hygiene habits into daily routines even among health-educated groups. Gender-wise differences in oral hygiene practices were pronounced and statistically significant across multiple domains, with female students consistently outperforming male students. Females were significantly more likely to brush twice daily (72.4% vs. 46.2%; $p = 0.001$), use a soft-bristled toothbrush (77.3% vs. 56.4%; $p = 0.002$), employ the circular brushing technique (63.3% vs. 43.6%; $p = 0.0015$), and use fluoride-containing toothpaste (76.0% vs. 62.8%; $p = 0.01$). Preventive dental visits were also significantly more common among females (29.9% vs. 17.9%; $p = 0.03$), while males predominantly sought dental care only when symptomatic. These findings are consistent with those of **Kamble et al.[16]** and **Gupta et al.[2]**, both of whom identified gender as a significant determinant of multiple oral hygiene practice variables, with females demonstrating higher compliance across brushing frequency, toothbrush selection, interdental aid use, and dental attendance behaviors. **Gupta et al.[2]** specifically found that frequency of toothbrush changing, brushing method, use of interdental aids, tobacco and alcohol use, and perceived cause of bad breath were all significantly associated with gender ($p < 0.05$). The superior preventive orientation of female students has been corroborated in international literature as well. A large-scale retrospective study of 9,098 university freshmen in Japan reported that males brushed less frequently than females, with 22.9% of males versus 11.2% of females brushing once daily or less ($p < 0.001$), confirming the cross-cultural consistency of this gender pattern.**Abe et al.[24]**The better oral hygiene practices among females in the present study are most plausibly attributed to heightened health-consciousness, stronger aesthetic motivation, and a more consistently preventive rather than reactive orientation toward healthcare. Risk behaviors were significantly more prevalent among male participants. Tobacco use was reported by 6.4% of males versus 1.0% of females ($p = 0.01$), and alcohol consumption by 9.0% of males versus 0.6% of females ($p = 0.0003$). Overall prevalence remained low at 2.07% for tobacco and 2.33% for alcohol, figures markedly lower than the 10-32% tobacco use rates documented among non-medical student cohorts in India.**Singh et al.[23]**, in a national cross-sectional study of 500 medical and 500 non-medical students across Indian dental colleges, confirmed that tobacco use was less prevalent among medical students than non-medical peers, attributing this difference to health awareness gained through professional training; nonetheless, they cautioned that even limited exposure to deleterious habits among future health professionals is a matter of concern given their patient education responsibilities. The low prevalence in the present study likely reflects the protective effect of ongoing health professional training; however, the clinical relevance of even low rates of tobacco and alcohol use is substantial. Tobacco use promotes periodontal inflammation by compromising immune defense mechanisms and altering the oral microenvironment, thereby elevating the risk of periodontal disease and oral potentially malignant disorders.**Gupta B et al. [21]**A hospital-based case-control study from Pune further documented that poor oral hygiene combined with tobacco chewing substantially elevated oral cancer risk, with synergistic effects particularly pronounced among ever-tobacco-chewers (adjusted OR = 14.74; 95% CI: 6.49-33.46).These findings collectively emphasize the importance of incorporating structured tobacco and alcohol cessation counseling into undergraduate medical and nursing curricula, with targeted behavioral interventions directed specifically at male students. Dental service utilization was

markedly suboptimal in the present study. One-third of participants (33.94%) had never visited a dentist, and among those who had, the dominant reason was symptomatic care — pain or treatment — rather than routine check-up or prevention. Nursing students demonstrated higher rates of preventive dental attendance (36.20%) compared to MBBS students (15.76%), and females accessed preventive dental care significantly more often than males (29.9% vs. 17.9%; p = 0.03). These patterns directly mirror findings by **Kamble et al.[16],** who reported that while 55% of first-year MBBS students had visited a dentist in the preceding five years, toothache was the predominant reason, and only 18.1% had sought dental consultation despite 27.7% reporting dental pain in the past 12 months — indicating that even symptomatic students delayed necessary care. **Gupta et al.[2]** similarly documented irregular dental visits and a clear tendency toward problem-oriented care among medical students. At the population level, **Paul et al.[15]** found that 40.62% of general outpatients in Kolkata had visited a dentist in the past six months, but 61.18% of those visits were pain-driven, underscoring that the reactive model of dental care utilization persists across both lay and educated populations in India.The present study additionally found that family members (42.08%) and the internet (32.99%) were the primary sources of oral health information for participants — sources that are unlikely to consistently reinforce evidence-based preventive dental behaviors. This further highlights the need for healthcare institutions to actively promote routine preventive dental attendance through periodic screening camps, interprofessional collaborations with dental departments, and formal curricular content on dental health-seeking behavior. The clinical significance of the observed practice gaps is amplified when considered alongside the growing body of evidence linking oral health to systemic disease. In the present study, 67.10% of participants recognized a connection between poor oral hygiene and cardiovascular health, with nursing students showing somewhat greater awareness (71.49%) than MBBS students (61.21%). While this proportion exceeds two-thirds, it leaves a substantial minority of future healthcare providers without awareness of a clinically important oral-systemic relationship. An umbrella review by **Arbildo-Vega et al.[11]** synthesized evidence from multiple systematic reviews and meta-analyses confirming strong associations between periodontal disease and cardiovascular disorders, and emphasizing that inadequate oral hygiene may promote systemic inflammation through bacteremia and immune dysregulation, thereby increasing cardiovascular risk. The global burden of oral disease is itself substantial: **Jin et al.[12]** documented that dental caries and periodontal disease are among the most prevalent non-communicable conditions worldwide, affecting individuals across all life stages and imposing significant reductions in quality of life, functional capacity, and economic productivity. In this context, the interdental cleaning deficit (34.97% never flossing), the low uptake of routine dental visits, and residual uncertainty about fluoride content in toothpaste observed in the present study are not merely individual practice deficiencies but represent a public health concern — one that is magnified when the individuals involved are future clinicians who will counsel communities about preventive health.

Comparing the two student cohorts, B.Sc. Nursing students demonstrated superior oral hygiene practices across nine of ten significant variables, including twice-daily brushing (76.47% vs. 54.55%), soft toothbrush use (82.81% vs. 60.00%), toothbrush replacement within three months (73.30% vs. 61.21%), circular brushing technique (68.78% vs. 46.67%), fluoride toothpaste use (78.73% vs. 66.06%), and preventive dental visits (36.20% vs. 15.76%). MBBS students, by contrast, demonstrated marginally better knowledge in certain domains, including identification of fluoridated toothpaste (85.45% vs. 74.66%) and WHO-recommended oral self-care components (83.64% vs. 76.92%). This dissociation between knowledge and practice — more pronounced among MBBS students than among nursing students — illustrates a well-recognized phenomenon in health professional education, whereby clinical and biomedical knowledge does not automatically translate into personal preventive behavior. **Sharda and Shetty[18],** in a comparative study of medical, paramedical, and non-medical students in Udaipur, documented similar inter-group variability and highlighted that the type and extent of healthcare training do not uniformly predict better oral hygiene practice. **Lay et al.[13]**

extended this observation to an interprofessional context, demonstrating that awareness and practice patterns varied meaningfully across dental, medical, and nursing cohorts in Indonesia, and advocating for interprofessional oral health education frameworks to create shared cultures of preventive oral healthcare. The knowledge-practice gap identified in the present study — where comprehensive awareness exists but consistent preventive action does not — underscores the need to move beyond didactic instruction. Structured skills-based training, routine dental screening programs within institutions, and integration of interprofessional oral health education into undergraduate curricula are essential to ensure that future healthcare providers are equipped not only with knowledge but with the habitual preventive behaviors necessary to serve as credible role models and effective advocates for oral health in the communities they will serve.

Limitations of the Study

This study has certain limitations. It was conducted over a short duration, which may not reflect long-term oral health practices. The absence of dedicated funding limited the scope of data collection and resources. The use of a self-reported online questionnaire may have introduced response bias. Additionally, as the study was confined to a single institution, the findings may have limited generalizability.

Conclusion

The present cross-sectional study among 386 undergraduate MBBS and B.Sc. Nursing students at Rajnandgaon, Chhattisgarh, demonstrated that healthcare trainees generally possess satisfactory oral health knowledge and maintain positive attitudes toward oral health. Nearly all participants (98.96%) recognized the link between oral and systemic health, 82.38% knew that teeth should be brushed twice daily, and 85.23% demonstrated a positive oral health attitude as measured by the validated Oral Health Values Scale (OHVS), with no statistically significant difference between MBBS (83.03%) and nursing (86.88%) students. Favorable oral hygiene practices were evident: 67.1% brushed twice daily, 73.06% used a soft-bristled toothbrush, 59.33% employed the recommended circular brushing technique, and tongue cleaning was practiced daily by 94.82% of participants. B.Sc. Nursing students consistently outperformed MBBS students across nine of ten significant oral hygiene practice parameters, including twice-daily brushing (76.47% vs. 54.55%), soft toothbrush use (82.81% vs. 60.00%), and preventive dental visits (36.20% vs. 15.76%), despite MBBS students demonstrating marginally higher knowledge scores on selected items. Notwithstanding these positive findings, the study identified clinically important gaps between knowledge and practice. Only 14.8% of participants used interdental cleaning aids, 34.97% reported never flossing, and 17.88% were uncertain of the fluoride content of their toothpaste — deficiencies that carry significant implications for the prevention of periodontal disease and dental caries. Dental service utilization was markedly suboptimal: 33.94% had never visited a dentist, and among those who had, symptomatic care — predominantly pain or treatment — was the dominant reason rather than routine prevention. Pronounced gender-based disparities were also documented. Female students were significantly more likely to brush twice daily (72.4% vs. 46.2%; $p = 0.001$), use a soft toothbrush (77.3% vs. 56.4%; $p = 0.002$), employ the circular brushing technique (63.3% vs. 43.6%; $p = 0.0015$), use fluoride-containing toothpaste (76.0% vs. 62.8%; $p = 0.01$), and attend preventive dental visits (29.9% vs. 17.9%; $p = 0.03$). Conversely, tobacco use (6.4% vs. 1.0%; $p = 0.01$) and alcohol consumption (9.0% vs. 0.6%; $p = 0.0003$) were significantly more prevalent among male students, behaviors that are strongly associated with periodontal disease and elevated oral cancer risk. These findings collectively highlight a persistent knowledge-practice gap among undergraduate healthcare trainees — a gap that is of particular concern given the pivotal health promotion role these students will assume as qualified practitioners. The study underscores the need for strengthening oral health education within undergraduate medical and nursing curricula through structured, skills-based training that moves beyond didactic instruction toward practical demonstrations of proper brushing technique, interdental cleaning, and fluoride use. Targeted behavioral interventions, particularly for male students, are essential to address the higher prevalence of deleterious habits. Institutions should establish routine

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dental screening programs and interprofessional collaborations with dental departments to promote regular preventive dental attendance. Given the well-documented link between oral health and systemic conditions including cardiovascular disease, reinforcing oral health competencies among healthcare trainees is not merely a matter of personal health — it is a public health imperative. Enhancing oral hygiene knowledge, attitudes, and practices among future healthcare providers will ensure that they serve as credible role models and effective advocates for preventive oral health in the communities they will serve.

Recommendations

Based on the findings of the present study, it is recommended that structured oral health education programs be integrated into undergraduate medical and nursing curricula, with greater emphasis on preventive practices and behavior change. Regular awareness sessions, workshops, and practical demonstrations on proper oral hygiene techniques should be conducted to bridge the gap between knowledge and practice. Targeted interventions, particularly for male students, are necessary to address risk behaviors such as tobacco and alcohol use. Institutions should also encourage routine preventive dental check-ups through periodic screening camps and collaborations with dental departments. Further multicentric studies with larger and more diverse populations are recommended to enhance generalizability and provide stronger evidence for policy formulation.

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