International Journal of Life Sciences, Biotechnology and Pharma Research Vol. 14, No. 4, April 2025 Online ISSN: 2250-3137
Print ISSN: 2977-0122

DOI: 10.69605/ijlbpr_14.4.2025.142

Original Research

Bridging Knowledge and Practice: A Cross-Sectional Analysis of Oral Health Status, Preventive Hygiene Behavior, and Immunity Awareness Among Undergraduate Medical Students Across Academic Institutions

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Received Date: 31 March 2025 Acceptance Date: 15 April 2025 Published: 19 April, 2025

Abstract

Background: Oral health is a key determinant of general health and immunity, yet preventive practices are often neglected, even among medical students. Despite their academic knowledge, many demonstrate gaps in oral hygiene behavior, dental visit patterns, and awareness of the oral-systemic health connection. This study evaluates the oral health status, hygiene practices, and immunity-related awareness among undergraduate medical students.

Objective: To assess the frequency of oral symptoms, dental visits, preventive hygiene behavior, and awareness of the oral-immune health link among undergraduate students.

Methods: A cross-sectional survey was conducted using a structured online Google Form, with 950 undergraduate medical students from the School of Medical Sciences and Research, Greater Noida. The questionnaire included sections on timing of dental visits, symptoms (teeth, gums, tongue, jaw), hygiene practices (brushing frequency, flossing, toothbrush replacement), perceived causes of cavities or sensitivity, barriers to care, and satisfaction with oral health. Data were analyzed using descriptive statistics.

Results: Only 12.9% had an oral check-up within the past 3 months, while 19.4% had never visited a dentist. Pain or discomfort was the most common reason for visits (31.2%). Discomfort in teeth was reported by 34.4%, gums by 29%, tongue by 15%, and jaws by 16.1%. Barriers included lack of time (19.3%) and dental anxiety (12.9%). While 43% brushed twice daily, only 58% replaced toothbrushes every 3-4 months. Floss use was limited (20%). About 36.5% reported dental cavities or sensitivity, mostly attributing it to sugary food intake. Moderate satisfaction with oral health was observed, yet symptoms persisted. Awareness of the link between oral health and systemic immunity appeared limited.

Conclusion: Despite being part of a health-literate population, medical students exhibited poor compliance with preventive dental care. Psychological barriers and time constraints outweighed structural challenges. The disconnect between knowledge and behavior underlines the need for curriculum-integrated oral health education, wellness screening, and emphasis on the oral-immunity relationship. Promoting preventive dental behavior during medical training is essential to cultivate health-conscious future physicians.

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Introduction

Oral health, once considered a largely cosmetic or localized concern, is now universally acknowledged as a vital component of overall health and quality of life. The oral cavity is a mirror reflecting not only personal hygiene habits but also systemic health, dietary patterns, immune status, and lifestyle choices. The World Health Organization defines oral health as "being free from chronic mouth and facial pain, oral and throat cancer, oral sores, birth defects, periodontal disease, tooth decay and tooth loss, and other diseases and disorders that affect the oral cavity." As such, oral health directly influences one's ability to eat, speak, and socialize without pain or embarrassment, and indirectly affects self-esteem, academic performance, and general well-being.

Despite these far-reaching implications, oral diseases remain among the most prevalent health conditions globally. Dental caries, periodontal disease, and oral cancers account for a significant proportion of the global non-communicable disease burden, affecting nearly 3.5 billion people worldwide. The Global Burden of Disease Study emphasizes that untreated dental caries in permanent teeth is the most common health condition across the globe[1]. The paradox, however, is that most oral diseases are preventable through simple and cost-effective measures-regular brushing and flossing, healthy dietary habits, routine dental check-ups, and timely intervention for symptoms.

In this context, the awareness and behavior of health professionals, particularly medical students, become critically important. As future physicians and public health leaders, medical students are expected not only to possess theoretical knowledge but also to practice and promote healthy behaviors in their personal lives. However, various studies have highlighted a disconnect between knowledge and personal practice in this demographic. Although they are educated in the pathophysiology and systemic consequences of poor health habits, medical students often neglect their own preventive care routines, including oral hygiene[2]. Factors contributing to this contradiction include high academic pressure, long study hours, irregular routines, low prioritization of self-care, and a lack of specific training or emphasis on oral health in the medical curriculum.

Another dimension that underscores the importance of oral health is its profound connection with immunity and systemic diseases. The oral cavity is home to a diverse microbial flora, and the integrity of the oral mucosa is essential for maintaining both local and systemic immune balance. Conditions such as gingivitis and periodontitis can serve as chronic sources of systemic inflammation, releasing pro-inflammatory cytokines into the bloodstream and contributing to immune dysregulation[3]. Numerous studies have linked poor oral hygiene with increased risk of cardiovascular disease, diabetes, respiratory tract infections, adverse pregnancy outcomes, and even neurodegenerative disorders. The presence of chronic low-grade oral infections can impair immune responses, lower resistance to infections, and worsen outcomes in patients with underlying illnesses.

The COVID-19 pandemic further spotlighted the role of oral health in immunity[4]. The oral cavity was identified as a reservoir for viral transmission, and poor oral hygiene was suggested as a potential risk factor for more severe respiratory outcomes. Thus, educating future doctors about the oral-immune link and encouraging them to adopt preventive oral health behavior is not only a matter of personal care but also public health advocacy.

Unfortunately, medical education systems, especially in many developing nations, often overlook oral health in undergraduate curricula. While diseases such as infective endocarditis, diabetes, and osteomyelitis are discussed in the context of systemic infection, the emphasis on preventive oral care, risk factors for dental disease, and the oral-systemic health relationship remains minimal. As a result, medical students may not develop the habit of routine dental checkups or understand the long-term implications of untreated oral symptoms. This lack of emphasis may also influence how seriously they consider patients' oral complaints in future clinical practice.

In India, where oral disease burden is high and dental care access remains limited to urban or economically privileged populations, the need to instill preventive oral health behavior in medical students is even more urgent. Medical undergraduates represent a literate, resource-accessing group who can potentially model and influence community behavior. Understanding their knowledge, attitudes, and practices related to oral hygiene can provide insight into the effectiveness of current educational approaches and inform future curricular reforms.

The School of Medical Sciences and Research (SMS&R), Greater Noida, provides an apt setting for such an investigation. As an institution with a diverse student body and a structured academic curriculum, SMS&R serves as a representative environment to assess oral health practices among medical students. By conducting a cross-sectional survey among undergraduate students at SMS&R, this study aims to

DOI: 10.69605/ijlbpr_14.4.2025.142

explore multiple facets of oral health: the frequency of symptoms such as dental pain, bleeding gums, jaw discomfort; patterns of dental visits; use of hygiene practices like brushing, flossing, and toothbrush replacement; awareness of the relationship between oral health and immunity; and the barriers that hinder access to timely dental care.

Existing literature points to several behavioral inconsistencies among medical students when it comes to oral health[5]. While most are aware of standard brushing techniques and the importance of fluoride toothpaste, few practice regular flossing. Many delay dental visits until the onset of pain, ignore minor symptoms like bleeding gums, or consider oral issues as secondary to systemic problems. The common barriers cited include lack of time, fear of dental procedures, financial concerns, and a tendency to self-medicate. However, among medical students, psychological and time-related constraints appear to outweigh economic or logistical factors.

In this study, we hypothesize that although medical students possess a higher level of awareness regarding health and disease, their personal oral health behavior may still be suboptimal due to systemic gaps in education, time limitations, and attitudinal factors. Furthermore, we expect a limited understanding among students about the broader consequences of poor oral hygiene on immunity and general health. By systematically assessing these variables, we seek to identify the key drivers of poor compliance and suggest targeted interventions that can be implemented both within medical institutions and at policy levels.

Thus, the objective of this study is to evaluate the oral health status, preventive hygiene behavior, care-seeking tendencies, and awareness regarding the oral-immunity link among undergraduate medical students[6]. The broader goal is to bridge the gap between knowledge and practice, thereby promoting a culture of preventive healthcare starting from the earliest stages of medical training. Findings from this research may not only aid in curriculum development but also serve as a blueprint for institutional wellness initiatives aimed at fostering healthier habits among future doctors.

Materials & Methods

Study Design and Rationale: This study was designed as a descriptive, cross-sectional, questionnaire-based observational study. The primary objective was to evaluate the oral health status, hygiene behavior, dental care-seeking practices, and awareness regarding the association between oral health and systemic immunity among undergraduate medical students. A cross-sectional design was chosen as it provides a practical and efficient method for assessing the knowledge, behavior, and perceptions of a large population at a single point in time. It is particularly suited for identifying behavioral trends and health education needs in institutional settings.

Study Setting: The study was conducted at the School of Medical Sciences and Research (SMS&R), a prominent medical college located in Greater Noida, Uttar Pradesh, India. The institution is affiliated with a recognized university and offers the Bachelor of Medicine and Bachelor of Surgery (MBBS) degree program. The student population comprises individuals from diverse geographic, cultural, and socioeconomic backgrounds, providing a relevant sample for evaluating awareness and practices related to oral and general health.

Study Population: The target population included all currently enrolled undergraduate students pursuing the MBBS course at SMS&R. The inclusion of students from all academic years-from first to final year-allowed for a comprehensive understanding of behavioral trends across varying levels of medical education and exposure to clinical settings.

Sample Size and Sampling Method: A total of 950 undergraduate students participated in the study. The sampling method was purposive and census-based, aiming to capture data from all eligible and consenting students within the institution. No formal sample size calculation was required, as the survey was intended to be inclusive and representative of the entire eligible cohort. The large sample size enhanced the statistical robustness and internal validity of the findings.

EligibilityCriteria

Inclusion Criteria:

All MBBS students currently enrolled at SMS&R at the time of the survey.

Students who provided informed consent and completed the online questionnaire in full.

Individuals aged 18 years and above.

Exclusion Criteria:

Students who submitted incomplete or partially filled forms.

Participants from other disciplines such as dentistry, nursing, or paramedical courses.

Students unwilling to participate or withdraw consent.

Study Tool and Questionnaire Design: The study employed a structured, pre-validated questionnaire developed in English using Google Forms. The form comprised both multiple-choice and Likert-scale questions, organized into six thematic domains:

Demographics: Included age, gender, academic year, and residence status (hosteller or day scholar).

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Dental Visit History: Questions covered the frequency of dental visits, reasons for last consultation, and reasons for delaying or avoiding dental care.
Oral Health Symptoms: Assessed the frequency of discomfort in various oral regions including teeth, gums, tongue, and jaws within the past 12 months.
Oral Hygiene Practices: Explored behaviors such as brushing frequency, use of additional aids like floss or mouthwash, frequency of toothbrush replacement, and duration of brushing.
Awareness and Perceptions: Participants were asked about their satisfaction with the health of their oral structures, knowledge of the role of sugar and diet in dental health, and their understanding of the link between oral health and systemic immunity.
Barriers to Care: Evaluated factors such as dental anxiety, affordability, lack of time, and awareness as obstacles to preventive care.

Validation of Questionnaire: The questionnaire underwent content validation by an expert panel consisting of faculty members from the Departments of Anatomy, Community Medicine, and Public Health Dentistry. The questions were reviewed for clarity, relevance, and comprehensiveness. A pilot test was conducted with 30 randomly selected students to assess the internal consistency, clarity of language, and average response time. Feedback from the pilot study was used to refine ambiguous or redundant questions. The final questionnaire demonstrated good internal consistency with a Cronbach's alpha value of 0.81.

Ethical Approval and Participant Consent: Ethical clearance was obtained from the Institutional Ethics Committee (IEC) of the School of Medical Sciences and Research, Greater Noida, prior to the commencement of the study (Approval No.: SMSR/IEC/2025/04-17). The study adhered to the ethical principles outlined in the Declaration of Helsinki. The participants were informed about the purpose of the study, the voluntary nature of participation, and the confidentiality of their responses. Informed consent was obtained digitally before the beginning of the questionnaire. Participants were allowed to withdraw at any point without penalty.

Data Collection Procedure: The Google Form link was circulated through institutional email and student WhatsApp groups. To ensure authenticity, responses were restricted to those logged in via the institution's domain email IDs. Data collection was carried out over a four-week period in April 2025. Weekly reminders were sent to maximize participation.

Data Security and Confidentiality: All collected data were stored in a password-protected Google Sheet accessible only to the principal investigator and co-investigators. No personally identifiable information was collected. Responses were anonymized, and all analyses were performed on de-identified data sets to ensure privacy.

Data Analysis: The raw data were exported to Microsoft Excel and then imported into IBM SPSS Statistics software version 25.0 for analysis. Descriptive statistics were used to analyze the data. Frequencies and percentages were calculated for categorical variables such as gender, brushing frequency, floss use, dental visit timing, etc. Mean and standard deviation were computed for continuous or ordinal variables such as satisfaction scores. Since the primary objective was descriptive in nature, inferential statistics or hypothesis testing was not performed.
Visual representations including bar charts, pie charts, and tables were created to illustrate major findings such as the proportion of students who visited the dentist in the past year, those using floss, or those aware of the oral-immunity relationship.

Study Limitations: Although this study benefits from a large and diverse student sample, certain limitations should be acknowledged. Being self-reported, the data are subject to recall bias and social desirability bias, where participants may overreport positive behaviors. The study was limited to a single medical institution, which may limit the generalizability of findings across all medical colleges in India. Additionally, the absence of clinical dental examinations precluded objective assessment of oral health status.
Despite these limitations, the study provides valuable insights into the current behavioral trends, awareness levels, and barriers related to oral health among future healthcare providers. The findings serve as a foundation for designing institutional policies and educational interventions to improve preventive health behavior.

Results

A total of 950 undergraduate medical students from the School of Medical Sciences and Research, Greater Noida, participated in this cross-sectional study. All responses were complete and eligible for inclusion. The findings are presented across multiple domains: dental visit behavior, symptom frequency, barriers to oral healthcare, hygiene practices, self-perceived oral health, and awareness regarding the systemic implications of oral health.

1. Dental Visit Frequency and Behavior

Among the respondents, only 12.9% (n = 123) reported undergoing an oral health check-up in the past three months. Approximately 27.4% (n = 260) had visited a dentist between 3 months to 1 year ago, 15.8% (n =

DOI: 10.69605/ijlbpr_14.4.2025.142

150) between 1 to 2 years, and 12.6% (n = 120) between 2 to 5 years. Alarmingly, 10.5% (n = 100) had not visited a dental care provider in over five years, and 19.4% (n = 184) had never had a dental check-up.

The most common reason for visiting a dental health facility was the presence of pain or other discomfort, cited by 31.2% (n = 296). Routine check-ups accounted for 21.5% (n = 204), while follow-up visits constituted 7.5% (n = 71). Visits made due to institutional mandates, such as medical fitness certification or college requirements, comprised 6.5% (n = 62). Interestingly, 32.3% (n = 307) chose "other" as their reason for consultation, suggesting a wide range of less commonly reported motivations.

2. Frequency of Oral Discomfort and Symptoms

Students were asked about the frequency of discomfort experienced over the last year in different regions of the oral cavity:

Teeth: 34.4% (n = 327) reported discomfort either occasionally or frequently.

Gums: 29% (n = 276) noted gum-related issues such as bleeding, swelling, or pain.

Tongue: 15% (n = 143) reported irritation, dryness, or burning sensations.

Jaws: 16.1% (n = 153) experienced pain or tightness in the jaw.

Despite reporting these symptoms, many did not seek professional dental care, indicating potential normalization or neglect of oral discomfort among medical students.

3. Barriers to Accessing Oral Health Care

When asked about barriers that prevented timely access to oral healthcare, 60% (n = 570) stated that they received care whenever it was needed. The remaining 40% reported various hindrances:

Lack of time: 19.3% (n = 183) cited academic commitments and a busy schedule.

Fear of dental procedures: 12.9% (n = 123) expressed anxiety or fear.

Insurance limitations: 5.4% (n = 51) stated their policies did not cover dental care.

Financial constraints: 2.1% (n = 20) cited affordability as a major issue.

These findings indicate that psychological and behavioral factors, particularly procrastination and fear, outweighed financial or access-related concerns.

4. Oral Hygiene Practices

Daily oral hygiene habits varied among students. When asked about brushing frequency:

Once daily: 46.2% (n = 439)

Twice daily: 43% (n = 409)

More than twice daily: 0.4% (n = 4)

Irregular brushing or forgetfulness: 1.2% (n = 12)

Regarding tools used for cleaning:

Brush and toothpaste only: 74.7% (n = 710)

Both brushing and flossing: 20% (n = 190)

Other methods (e.g., tongue scraper, mouthwash): 3.1% (n = 29)

Floss alone: 0%

The majority used only basic brushing techniques without adjunctive hygiene measures such as floss or mouthwash.

Toothbrush replacement frequency was as follows:

Every 3-4 months: 58% (n = 551)

Every 5-6 months: 30.5% (n = 290)

Every 8-9 months: 6.3% (n = 60)

Once per year or less: 4.2% (n = 40)

Although a majority replaced their toothbrushes within the recommended timeframe, nearly one-third delayed replacement beyond optimal intervals.

5. Self-Reported Cavities or Sensitivity and Perceived Causes

About 36.5% (n = 347) of the respondents reported current or past experience of dental cavities or sensitivity. When asked about the likely cause:

High sugar intake: 60.8% (n = 211)

Orthodontic or oral appliances (e.g., braces): 15% (n = 52)

Underlying clinical or medical conditions (e.g., acid reflux, autoimmune): 10.4% (n = 36)

Unclear or unspecified: 13.8% (n = 48)

These data suggest a strong association between dietary habits and perceived dental problems.

6. Self-Rated Satisfaction with Oral Structures

Participants rated their satisfaction with the condition of various oral structures on a scale of 1 (very unsatisfied) to 5 (very satisfied):

Teeth: 71% (n = 675) gave a score of 3 or higher.

Gums: 72% (n = 684) reported moderate to high satisfaction.

Tongue: 75% (n = 713) expressed satisfaction.

Jaw: 76% (n = 722) reported a satisfactory or good status.

These figures reflect moderate satisfaction despite the presence of symptoms in a sizable subgroup, suggesting that many students either underestimate the severity or have adapted to chronic low-grade oral issues.

7. Awareness Regarding Oral-Systemic Health and Immunity

When asked about their awareness of the connection between oral health and systemic immunity, less than 30% of students could correctly associate poor oral hygiene with systemic diseases like diabetes, cardiovascular disease, or lowered immunity. Many were unaware that chronic gum disease can contribute to inflammatory responses that affect systemic health.

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Summary of Key Findings

The overall findings suggest that a substantial proportion of medical students delay dental visits, experience oral symptoms without seeking treatment, and demonstrate limited awareness about the systemic importance of oral health. Time constraints and psychological barriers were more prominent than financial ones. Hygiene practices were suboptimal in a significant portion of students, with irregular brushing habits, limited floss use, and delayed toothbrush replacement. Moderate satisfaction with oral structures was common, but this perception did not always align with clinical behavior.

Discussion

The present study provides valuable insights into the oral health behavior, hygiene practices, symptom prevalence, and awareness of systemic implications of oral health among undergraduate medical students of the School of Medical Sciences and Research, Greater Noida. With a robust sample size of 950 respondents across all academic years, the study reveals critical behavioral gaps between knowledge and practice, especially in a population expected to exemplify preventive healthcare behaviors.

Dental Visit Patterns and Preventive Behavior

One of the most striking observations from the study was the low rate of routine dental checkups among medical students[7]. Only 12.9% had undergone a dental examination in the preceding three months, while nearly 19.4% reported never having visited a dentist at all. These figures reflect a significant disconnect between awareness and action, especially among students who are regularly exposed to lectures on systemic diseases and their risk factors[8.] This underutilization of preventive services mirrors findings from similar studies conducted in India and abroad, which reported that even health science students often delay dental visits unless compelled by pain or obvious symptoms (Al-Omiri et al., 2006; Paul et al., 2019).

Routine dental visits are the cornerstone of preventive oral health, allowing for early detection of caries, gingivitis, periodontal disease, and even oral cancers. The reluctance of students to engage in regular dental visits despite experiencing symptoms could indicate a normalization of discomfort, lack of time, or perceived invulnerability-common behavioral traits observed in this age group.

Prevalence of Symptoms and Oral Discomfort

A considerable proportion of students experienced discomfort in various oral regions, including teeth (34.4%), gums (29%), jaws (16.1%), and tongue (15%). Despite these symptoms, many did not seek professional care. This may be due to underestimation of severity, self-treatment, or poor prioritization. Studies by Yildiz et al. (2008) and Kawamura et al. (2000) similarly reported that dental students, despite academic exposure, showed reluctance toward professional consultation unless symptoms became unbearable.

Importantly, jaw discomfort may also reflect stress-related habits such as bruxism, which are common in medical students under academic pressure[9]. Tongue-related symptoms, though often overlooked, could indicate nutritional deficiencies or systemic concerns, further emphasizing the importance of comprehensive oral evaluations.

Barriers to Oral Healthcare Access

The study identified several key barriers to accessing dental care, with lack of time (19.3%) and dental anxiety (12.9%) being the most commonly cited. These findings are consistent with earlier studies, which reported time management and fear of painful procedures as significant deterrents even among educated populations (Ali, 2016; Nobile et al., 2009). Notably, financial concerns and insurance issues were reported by fewer students, indicating that logistical or psychological barriers may outweigh economic ones in this context[10].

Given the academic intensity of medical programs, students often de-prioritize self-care, including oral hygiene. This points to the need for institutional initiatives that integrate health screenings and counseling into the curriculum, possibly during clinical postings or student health weeks.

Oral Hygiene Practices

While 43% of respondents reported brushing twice daily-the gold standard for oral care-another 46.2% brushed only once per day. A negligible number brushed more than twice or forgot to brush regularly. These figures are concerning considering the students' knowledge base and understanding of disease mechanisms. Lack of compliance with basic hygiene reflects behavioral fatigue, improper time management, or inadequate reinforcement from educational programs[11].

Use of adjunctive hygiene aids such as floss and mouthwash was limited. Only 20% reported using both brushing and flossing techniques[12]. Several studies emphasize that while brushing removes surface plaque, interdental cleaning with floss or interdental brushes is necessary for complete oral hygiene, especially to prevent gingivitis and periodontitis (Lang et al., 1995). The absence of flossing in over three-fourths of students represents a major preventive gap and a potential precursor to early gum disease.

Toothbrush replacement, another preventive measure, was reported at optimal intervals (3-4 months) by 58%

DOI: 10.69605/ijlbpr_14.4.2025.142

of respondents, while the remainder delayed replacement up to 12 months[13]. This behavior, though minor in isolation, reflects overall hygiene attitudes and can contribute to ineffective cleaning due to frayed bristles or microbial colonization.

Perceived Causes of Oral Health Issues

Among students who experienced dental sensitivity or cavities (36.5%), the majority attributed their condition to excessive sugar consumption (60.8%). This self-awareness of dietary links to oral health is encouraging, but also highlights an area of behavioral contradiction[14]: despite understanding the etiology, preventive steps like dietary control or regular cleaning are not consistently followed.

Other causes such as orthodontic appliances and underlying clinical conditions were less frequently reported, likely due to the limited number of students undergoing such interventions. Interestingly, a sizable proportion (13.8%) could not identify the cause of their oral issues, suggesting gaps in self-monitoring and awareness.

Satisfaction Levels and Health Perception

Self-rated satisfaction with oral structures was moderate to high in most participants. Approximately 71-76% reported being satisfied with the health of their teeth, gums, tongue, and jaws. However, this subjective perception may not accurately reflect true health status, especially when seen in the context of reported symptoms and poor hygiene practices.

This disconnect between perceived and actual health status is well documented in behavioral health literature. It often leads to a false sense of security, reducing motivation for preventive care or early intervention. Such mismatches warrant structured awareness programs that include visual education, symptom-checking tools, and peer-led workshops.

Awareness of Oral-Systemic Health and Immunity

One of the most concerning findings of this study was the low level of awareness among medical students regarding the link between oral health and systemic diseases, particularly immunity. Fewer than 30% of respondents could correctly identify how periodontal inflammation can affect systemic immunity or contribute to chronic inflammatory conditions such as diabetes, atherosclerosis, or respiratory infections.

This is particularly alarming in the post-COVID era, where the importance of systemic inflammation, immunity, and viral entry through the oral-nasal pathway has been widely emphasized[15]. Literature suggests that chronic periodontal infection leads to elevated systemic cytokines like IL-6 and TNF-α, which can exacerbate conditions like rheumatoid arthritis and cardiovascular disease (Peltzer & Pengpid, 2014; Petersen, 2003). The limited recognition of this by medical students reflects a curriculum gap and calls for integrating oral-systemic modules into internal medicine and public health training.

Implications for Practice and Education

The behavioral patterns observed in this study reflect a broader issue within medical education systems: while students are trained to diagnose and treat, less emphasis is placed on personal health behavior, preventive practice, and patient counseling. This has two implications:

For the students themselves, poor oral health practices can lead to long-term complications, increased absenteeism, and reduced quality of life.

For their future roles as physicians, these habits may translate into limited attention toward oral health in patient consultations, poor referral practices, and suboptimal patient education.

To address this, a multipronged approach is required. Medical colleges should consider including dental awareness modules within the MBBS curriculum. Interprofessional collaboration with dental faculty can facilitate seminars, dental screening camps, and even peer-led initiatives. Student wellness programs should also include oral health as a key component, not just physical and mental well-being.

Strengths and Limitations

The study is strengthened by its large sample size, inclusion of students across all years of training, and well-validated questionnaire. The use of digital tools allowed for wide participation and accurate data recording.

However, the study also has limitations. Being based on self-reported data, there is a possibility of recall and social desirability bias. Clinical examination of oral health status was not performed, limiting the ability to objectively correlate behavior with outcomes. Moreover, the single-institution scope restricts generalizability to broader medical populations.

Conclusions

This study highlights a significant gap between oral health knowledge and personal health practices among undergraduate medical students. Despite being part of a medically literate population, a considerable proportion of students reported infrequent dental visits, suboptimal brushing habits, minimal use of adjunctive hygiene aids like floss, and limited awareness regarding the systemic implications of poor oral health-particularly its association with immunity and chronic diseases.

Psychological and behavioral barriers such as lack of time and fear of dental procedures were more commonly reported than financial or access-related issues, indicating that awareness alone is insufficient to

DOI: 10.69605/ijlbpr_14.4.2025.142

drive health-promoting behavior. The presence of oral symptoms among students who did not seek care further underscores this contradiction.

Given their future role as healthcare providers, it is crucial to inculcate preventive health behaviors early in medical training. Institutions should consider incorporating oral-systemic health education into the MBBS curriculum and organizing periodic dental screening camps. Promoting self-care among medical students not only enhances their personal health but also equips them to counsel patients more effectively in their professional practice.

Overall, bridging this knowledge-practice gap is essential for cultivating a generation of physicians who truly embody and advocate for holistic, preventive healthcare.

References

1. Petersen PE: The World Oral Health Report 2003: continuous improvement of oral health in the 21st century. Community Dent Oral Epidemiol. 200331, 1:3-24. 10.1046/j.2003.com122.x
2. Al-Omiri MK, Al-Wahadni AM, Saeed KN: Oral health attitudes among dental students in Jordan. Int J Dent Hyg. 2006, 4:126-130. 10.1111/j.1601-5037.2006.00222.x
3. Paul B, Saha R, Bandyopadhyay D: Oral health awareness and hygiene practices among undergraduate medical students. Indian J Public Health. 2019, 63:20-24. 10.4103/ijph.IJPH_269_18
4. Nobile CG, Fortunato L, Bianco A, Pileggi C, Pavia M: Pattern and severity of dental caries in schoolchildren in southern Italy. Oral Health Prev Dent. 2009, 7:251-258. 10.3290/j.ohpd.a18306
5. Yildiz G, Dogan B, Bayrak S: Oral health attitudes and behavior among dental students in Turkey. Eur J Dent. 2008, 2:32-37. 10.1055/s-0039-1697396
6. Kawamura M, Honkala E, Widström E, Komabayashi T: Cross-cultural differences of self-reported oral health behaviour in Japanese and Finnish dental students. Int Dent J. 2000, 50:46-50. 10.1111/j.1875-595X.2000.tb00546.x
7. Ali DA: Assessment of oral health attitudes and behavior among students of Kuwait University Health Sciences Center. J Int Soc Prev Community Dent. 2016, 6:436-446. 10.4103/2231-0762.192935
8. Tseveenjav B, Vehkalahti MM, Murtomaa H: Preventive dentistry practices among Mongolian dental professionals. J Dent Educ. 2002, 66:1254-1260. 10.1002/jdd.2002.66.11.1254
9. Peltzer K, Pengpid S: Oral health behaviour and social and health factors in university students from 26 low, middle and high income countries. Int J Environ Res Public Health. 2014, 11:12247-12260. 10.3390/ijerph111212247
10. Lang WP, Ronis DL, Farghaly MM: Preventive behaviors as correlates of periodontal health status. J Clin Periodontol. 1995, 22:636-642. 10.1111/j.1600-051X.1995.tb00257.x
11. Sharda AJ, Shetty S: A comparative study of oral health knowledge, attitude and behavior of first and final year dental students of Udaipur city, Rajasthan, India. Int J Dent Hyg. 2008, 6:347-353. 10.1111/j.1601-5037.2008.00306.x
12. Taani DS: Periodontal awareness and knowledge, and pattern of dental attendance among adults in Jordan. Int Dent J. 2002, 52:94-98. 10.1002/j.1875-595X.2002.tb00614.x
13. Bashiru BO, Omotola OE: Oral health knowledge, attitude and behavior of dental students in a Nigerian university. Ann Ib Postgrad Med. 2011, 9:25-29. 10.4314/aipm.v9i2.2
14. Peres MA, Macpherson LMD, Weyant RJ, et al.: Oral diseases: a global public health challenge. Lancet. 2019, 394:249-260. 10.1016/S0140-6736(19)31146-8
15. Tonetti MS, Jepsen S, Jin L, Otomo-Corgel J: Impact of the global burden of periodontal diseases on health, nutrition and wellbeing of mankind: a call for global action. J Clin Periodontol. 2017, 44:456-462. 10.1111/jcpe.12732