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Assessment of Oral Health Knowledge, Attitude, and Practices among Pharmacy Students: A Cross-Sectional Study

Dr. Ravi Vijay Chopade[1], Dr. Asmita Hamand[2]

[1]Department of Public Health Dentistry, School of Dental Sciences, Krishna Vishwa Vidyapeeth (Deemed to be University), Karad, Maharashtra, India
[2]Assistant Professor, Department of Public Health Dentistry, School of Dental Sciences, Krishna Vishwa Vidyapeeth (Deemed to be University), Karad, Maharashtra, India

ABSTRACT

Background: Oral diseases affect over 3.5 billion people globally and are strongly linked with systemic conditions. Pharmacists, due to their accessibility, are in a unique position to influence oral health behaviors, yet oral health education is minimally emphasized in pharmacy curricula.

Aim: To evaluate knowledge, attitudes, and practices (KAP) related to oral hygiene among undergraduate pharmacy students.

Methodology: A cross-sectional questionnaire study (15 items: 5 knowledge, 5 attitude, 5 practice) was conducted online. Responses from 76 participants were proportionally extrapolated to the statistically calculated sample size of 400 (95% CI, 5% margin of error). Descriptive statistics were applied.

Results: While 65.5% reported brushing twice daily, only 33.3% followed the ideal brushing duration. Awareness that tobacco harms oral tissues was seen in 69.5%. Only 46.5% adhered to six-monthly dental visits. A highly positive attitude toward inclusion of oral health in pharmacy education (97.5%) was observed. Use of adjunct hygiene aids such as floss was low (18.8%).

Conclusion: Positive attitudes contrast with gaps in preventive knowledge and practices. Structured oral health education within pharmacy curricula is strongly recommended.

Keywords: Oral health, Pharmacy students, KAP, Preventive dentistry, Interprofessional education

INTRODUCTION

Oral health is an essential component of general health, well-being, and quality of life. Oral diseases such as dental caries, periodontal disease, oral cancer, and edentulism are among the most prevalent non-communicable diseases worldwide, affecting individuals across all age groups.[1] The Global Burden of Disease Study reported that untreated dental caries in permanent teeth is the most common health condition globally.[2] Despite being largely preventable, oral diseases continue to impose significant social, psychological, and economic burdens.

The relationship between oral and systemic health is now well established. Periodontal disease has been linked to diabetes mellitus, cardiovascular diseases, respiratory infections, adverse pregnancy outcomes, and rheumatoid arthritis.[3] This interrelationship underscores the need for all healthcare professionals—not only dentists—to possess basic oral health knowledge and preventive awareness.

Pharmacists are among the most accessible healthcare providers in the community. Patients frequently approach pharmacists for advice regarding pain, ulcers, bleeding gums, halitosis, tooth sensitivity, mouth ulcers, and over-the-counter oral hygiene products.[4] Community pharmacies stock a wide range of oral care products including fluoridated toothpastes,

mouthwashes, interdental aids, denture cleansers, and medicated gels. This positions pharmacists ideally to promote oral health education and preventive practices.

However, pharmacy education traditionally focuses on pharmacology, therapeutics, and dispensing practices, with limited integration of oral health topics.[5] Studies from different countries have reported inadequate oral health literacy among pharmacy students and practicing pharmacists.[6–8] This educational gap reduces their ability to provide evidence-based oral health guidance.

Interprofessional education has been advocated globally to integrate oral health into general healthcare training.[9] The World Health Organization emphasizes the integration of oral health into primary healthcare systems.[10] Training pharmacy students in basic oral health assessment, preventive counseling, and referral pathways can significantly improve community oral health outcomes.

Previous studies have demonstrated a discrepancy between healthcare students' positive attitudes toward oral hygiene and their actual practices.[11–13] Understanding this gap among pharmacy students is crucial for curriculum planning.

The present study assesses oral health knowledge, attitudes, and practices among pharmacy students using a structured questionnaire provided in the study protocol. The findings aim to provide baseline evidence supporting the inclusion of oral health modules in pharmacy education and fostering interdisciplinary collaboration between dental and pharmacy professionals.

METHODOLOGY

This study was designed as a cross-sectional questionnaire-based survey to assess the knowledge, attitudes, and practices related to oral health among pharmacy students. The sample size was determined to be 400 participants using the standard formula n=z2pq/L2n = z^2pq / L^2n=z2pq/L2, ensuring a 95% confidence interval with a 5% margin of error.

Data were collected using a structured and validated 15-item questionnaire divided into three domains: knowledge, attitude, and practice. The questionnaire was administered through Google Forms to facilitate easy access and response collection. The gathered data were analyzed using descriptive statistical methods, including frequency and percentage distribution.
Ethical considerations were strictly maintained, with voluntary participation, informed consent, and complete anonymity of respondents ensured throughout the study. (……..)

RESULTS

Table 1. Knowledge Regarding Oral Hygiene (n=400)

Variable	Response	n (%)
Brushing twice daily	Yes	251 (62.8)
Ideal brushing time (2–3 min)	Yes	133 (33.3)
Dental visit every 6 months	Yes	186 (46.5)
Tobacco harms oral tissues	Yes	278 (69.5)
Correct brushing method confidence	Yes	160 (40.0)

This table demonstrates the level of knowledge related to basic oral hygiene among pharmacy students. Although a majority (62.8%) reported brushing twice daily, only one-third (33.3%) were aware of the ideal brushing duration of 2–3 minutes. Less than half of the participants (46.5%) recognized the importance of routine dental visits every six months. Awareness regarding the harmful effects of tobacco on oral tissues was relatively high (69.5%). However, only 40% of students expressed confidence in their knowledge of the correct brushing technique, indicating superficial awareness without strong practical understanding.

Table 2. Attitude Toward Oral Health (n=400)

Variable	Positive Response	n (%)
Dentist visit without symptoms important	240 (60.0)	

Variable	Positive Response	n (%)
Oral hygiene vital for general health	213 (53.3)	
Oral health neglected in curriculum	181 (45.3)	
Willing to invest in prevention	191 (47.8)	
Support oral health in pharmacy curriculum	390 (97.5)	

This table reflects the attitudes of pharmacy students toward oral health. A positive perception was observed, with 60% agreeing that dental visits are important even in the absence of symptoms. Over half of the participants (53.3%) acknowledged that oral hygiene is essential for overall health. Nearly half (45.3%) felt that oral health is neglected within healthcare education. Importantly, an overwhelming majority (97.5%) supported the inclusion of oral health topics in the pharmacy curriculum, highlighting recognition of the educational gap.

Table 3. Oral Hygiene Practices (n=400)

Practice	n (%)
Brushing twice daily	262 (65.5)
Mouthwash use	224 (56.0)
Dental floss use	75 (18.8)
Tongue cleaner use	190 (47.5)
Toothbrush change 2–3 months	191 (47.8)
Regularly inform others	235 (58.8)

This table presents the actual oral hygiene practices followed by the participants. While 65.5% practiced brushing twice daily, the use of adjunct oral hygiene aids was inconsistent. Mouthwash was used by 56% of students, whereas only 18.8% reported using dental floss, indicating poor interdental cleaning habits. Nearly half of the students used a tongue cleaner and changed their toothbrush at recommended intervals. Encouragingly, 58.8% reported that they regularly educate others about maintaining oral hygiene. Figures (Graphs)

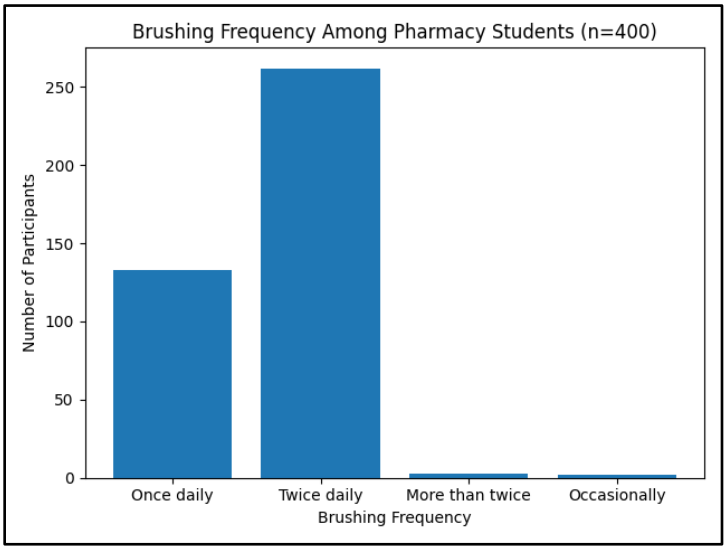

Figure 1: **Brushing frequency distribution**

This graph illustrates the distribution of brushing frequency among participants. The majority of students brushed twice daily, while a smaller proportion brushed once daily. Very few participants reported brushing more than twice or occasionally. The graph highlights that although frequency is acceptable for most students, this does not necessarily reflect correct technique or duration.

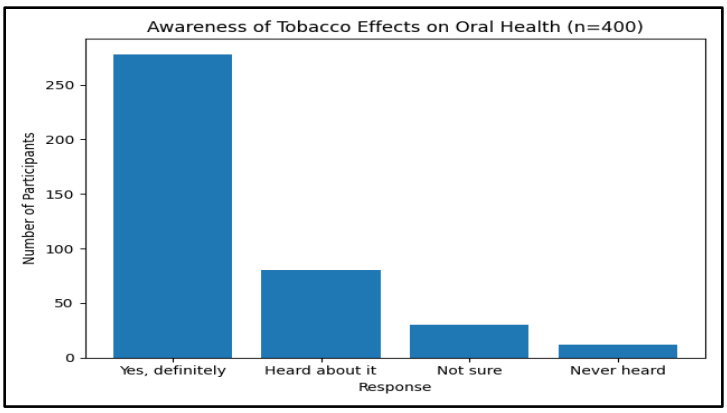

Figure 2: Awareness of tobacco effects on oral health

This graph shows participants' awareness regarding the harmful effects of tobacco on oral tissues. Most students responded "Yes, definitely," indicating good awareness. However, a noticeable number had only heard about it or were unsure, suggesting room for improvement in detailed knowledge regarding tobacco-related oral diseases.

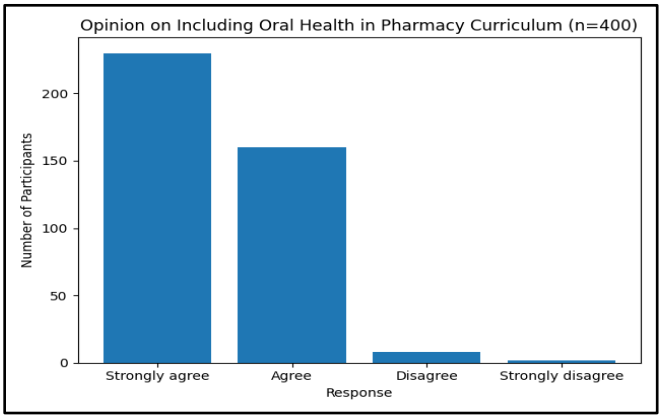

Figure 3: Opinion on inclusion of oral health in pharmacy curriculum

This graph depicts the strong agreement among students regarding the inclusion of oral health education in the pharmacy curriculum. The vast majority either strongly agreed or agreed, while only a negligible number disagreed. This emphasizes students' recognition of the need for formal oral health training.

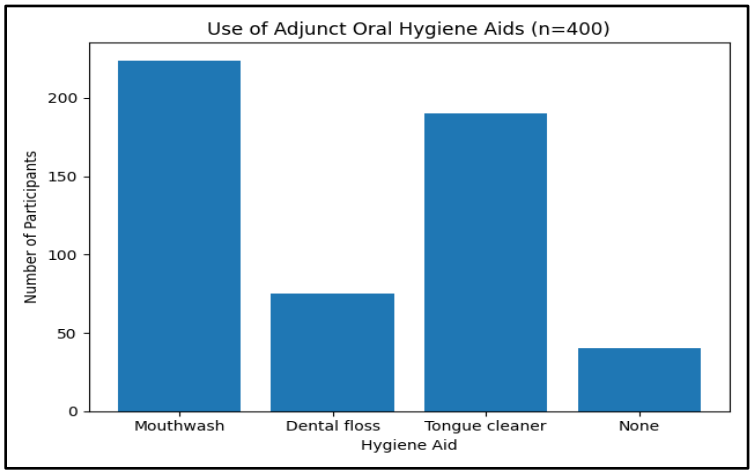

Figure 4: Use of adjunct oral hygiene aids

This graph represents the usage pattern of additional oral hygiene aids apart from toothbrushes. Mouthwash and tongue cleaners were moderately used, while dental floss usage was notably low. A small proportion reported not using any adjunct aids. The graph highlights inadequate interdental cleaning practices among students.

DISCUSSION

The present study reveals a notable contrast between positive attitudes and suboptimal preventive knowledge and practices among pharmacy students.

Although two-thirds reported brushing twice daily, only one-third followed the correct brushing duration. This reflects superficial awareness without depth of practical knowledge, consistent with findings by Halboub et al. and Baseer et al.[6,7] Preventive dental visits every six months were followed by less than half the participants, similar to trends observed in Turkish and Malaysian pharmacy students.[11,12]

Awareness regarding tobacco's harmful effects was relatively high (69.5%), likely reflecting effective public health campaigns. However, low floss usage (18.8%) and irregular dental visits indicate gaps in understanding interdental plaque control and professional care importance.[13]

A striking finding was the overwhelming support (97.5%) for including oral health education in pharmacy curricula. This aligns with WHO and global interprofessional education recommendations.[9,10] Students recognize the deficiency and express willingness to bridge it.

Pharmacists frequently encounter patients with oral complaints and are responsible for recommending OTC products. Without adequate training, this advice may be incomplete or incorrect.[14] Integrating short oral health modules, clinical demonstrations, and collaborative workshops with dental faculties can significantly enhance competency.

The discrepancy between attitude and practice observed here is widely reported in healthcare education literature.[15] Knowledge alone does not translate into behavior unless reinforced through practical training and curriculum emphasis.

Implications

The findings of this study have important implications for pharmacy education and practice. There is a clear need for curriculum reform to incorporate structured oral health education within pharmacy training, ensuring that students gain essential knowledge and practical skills related to preventive oral care. Organizing interprofessional workshops and collaborative learning sessions with dental students can foster mutual understanding and promote a team-based approach to healthcare delivery. In addition, continuing education programs focused on oral health can help reinforce and update knowledge beyond the classroom. Training pharmacy students in the early identification of oral lesions and appropriate referral pathways will further empower them to contribute effectively to early diagnosis, patient counseling, and overall improvement of community oral health outcomes.

CONCLUSION

The present study highlights a meaningful gap between favorable attitudes toward oral health and the actual depth of knowledge and preventive practices among pharmacy students. While a majority of participants recognized the importance of oral hygiene for overall health and strongly supported the inclusion of oral health topics in the pharmacy curriculum, critical deficiencies were observed in practical behaviors such as adherence to ideal brushing duration, regular dental visits, and use of interdental cleaning aids like dental floss.

These findings indicate that pharmacy students possess awareness without adequate practical reinforcement, a pattern commonly seen when formal education does not sufficiently emphasize a topic. Given the frequent public interaction of pharmacists and their accessibility in community settings, this gap represents a missed opportunity in preventive healthcare delivery. Pharmacists are often consulted for oral complaints, over-the-counter oral care products, and advice regarding oral symptoms; therefore, insufficient training in oral health limits their potential contribution to early detection, patient education, and timely referral.

The overwhelming support expressed by participants for integrating oral health education into pharmacy training reflects both recognition of this gap and readiness to address it. Incorporating structured oral health modules, interprofessional learning with dental students, and practical exposure to oral screening can significantly enhance the competence of future pharmacists as oral health promoters.

This study provides baseline evidence advocating for curriculum reform, interdisciplinary collaboration, and preventive health orientation in pharmacy education. Empowering pharmacy students with essential oral health knowledge and skills can strengthen community-level prevention strategies, reduce the burden of oral diseases, and contribute to a more holistic healthcare approach.

In conclusion, bridging the gap between attitude and practice through targeted educational interventions will enable pharmacists to play a vital role in improving oral and overall public health outcomes.

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