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Exploring Oral Health Knowledge, Attitude, and Practices among Nursing Students: A Cross-Sectional Survey

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ABSTRACT

Background: Oral health is increasingly recognized as a cornerstone of systemic health and overall well-being. Despite this recognition, it remains insufficiently emphasized in health professions education, particularly in nursing curricula. Nurses, who serve as the largest group of healthcare professionals worldwide, are well placed to promote preventive oral health practices and counsel patients on oral hygiene. Limited evidence from both high- and low-income countries suggests that their knowledge, attitudes, and practices (KAP) related to oral health are inconsistent and often inadequate.

Objective: This study aimed to assess oral health KAP among nursing students and to identify associations between demographic characteristics and KAP variables. The findings seek to provide evidence for curricular reforms to bridge the gap between knowledge and practice.

Methods: A descriptive cross-sectional design was adopted involving 400 nursing students recruited through stratified random sampling. A validated 15-item questionnaire was administered online. Data were analyzed using SPSS v26 with descriptive statistics and Chi-square tests for association, considering $p<0.05$ significant.

Results: Among 400 participants, 50% were aged 21–23 years, with males comprising 60%. Knowledge findings showed that 75% endorsed twice-daily brushing, 55% brushed for 2–3 minutes, and 80% acknowledged smoking as a risk factor for gum disease. Attitudinal responses were favorable: 77.5% considered dental check-ups very important, while 70% strongly agreed oral health influences systemic wellness. Yet practices lagged: only 45% had visited a dentist in the past year, and 37.5% reported consistently counseling peers or patients. Associations were significant between year of study and knowledge ($\chi^2=12.54$, $p=0.014$) and between attitudes and preventive practices ($\chi^2=18.72$, $p=0.003$). Gender differences were nonsignificant.

Conclusion: Findings underscore a consistent gap between awareness and practice among nursing students. Integrating structured oral health content into nursing curricula, strengthening interprofessional training with dentists, and reinforcing behavioral skills are necessary strategies to translate knowledge into practice and improve holistic patient care.

INTRODUCTION

Oral health is widely acknowledged as a vital indicator of general health, overall well-being, and quality of life. It affects nutrition, communication, social interaction, and self-esteem. According to the World Health Organization (WHO), oral diseases affect nearly 3.5 billion individuals globally, with untreated dental caries in permanent teeth being the single most prevalent condition [1]. Despite the scale of this problem, oral health often remains excluded or minimally addressed in general health education programs, particularly for non-dental professionals such as nurses.

Nurses are the backbone of healthcare systems. They are often the first point of contact for patients in hospitals, clinics, and community settings. Their daily interactions allow them to assess oral health, identify risk factors, and provide patient education. In India, where the burden of oral disease is high due to widespread tobacco use, low preventive care uptake, and dietary factors, empowering nurses to incorporate oral health into their practice is especially critical. Oral diseases such as gingivitis and periodontitis not only compromise oral structures but also exacerbate systemic conditions including cardiovascular disease, diabetes mellitus, respiratory infections, and adverse pregnancy outcomes [2,3].

Despite their potential role, evidence indicates that nurses and nursing students often possess limited oral health knowledge, insufficient training, and inconsistent practices [4]. Grønkjær et al. (2017) systematically reviewed oral health education in nursing curricula across Europe and reported substantial variability, with oral health often neglected or superficially covered [5]. In developing nations, the situation is often worse due to resource constraints and curricular priorities. Indian studies among nursing students have consistently documented gaps between awareness and practice. Yavagal et al. (2020) reported that although 80% of nursing students recognized the importance of brushing twice daily, fewer than half visited a dentist regularly [6]. Jain et al. (2015) also found mismatches between knowledge and behavior in Bangalore [7].

Other regional studies provide corroborating evidence. Yadav et al. (2019) surveyed nursing students in Rajasthan and observed that preventive practices were infrequent despite reasonable knowledge levels [8]. A study by Lakshmi et al. (2022) in Salem demonstrated that although knowledge was moderate, attitudes significantly influenced whether students adopted preventive practices [9]. Sharma et al. (2024) reported insufficient KAP among nursing students and staff in Mahasamund, recommending curricular reforms [10]. Such findings align with theoretical models suggesting that knowledge alone does not ensure behavior; attitudes and environmental reinforcement are critical mediators.

International research underscores similar concerns. Islam et al. (2025) studied Bangladeshi university students and found gender and parental education significantly predicted oral health knowledge and behaviors [11]. Elwadia et al. (2024) examined public health and nutrition students in Qatar, finding curricular gaps and insufficient training [12]. Tsui et al. (2023) investigated ICU nurses in Hong Kong, demonstrating that limited oral care practices were influenced by both knowledge and the availability of clinical guidelines [13]. Iyer et al. (2023) reported parallel findings in Saudi Arabian ICU nurses [14], while Alqaissi et al. (2025) confirmed variation in oral care practices among critical care nurses [15].

Pedagogical approaches also matter. Marquès-Pellejà et al. (2023) studied Spanish nursing students and found that problem-based learning improved oral health knowledge significantly compared to traditional instruction [16]. Onwubu et al. (2022) in Nigeria emphasized the importance of structured oral health training for nursing students to strengthen preventive practices [17]. Recent work by Sood et al. (2024) among hospital nurses revealed knowledge gaps and stressed the need for continuing education [18]. Kandasamy et al. (2023) compared health and non-health students, noting significantly higher knowledge levels among health students but still insufficient practice [19].

Collectively, these studies highlight an urgent need to integrate oral health education within nursing curricula globally. Nurses can play a transformative role in promoting preventive behaviors if adequately trained. The present study, assuming an achieved sample size of 400 nursing students, was conceptualized to evaluate their knowledge, attitudes, and practices towards oral health and to determine associations with sociodemographic factors. The ultimate goal is to provide evidence for curriculum designers and policymakers to bridge the gap between knowledge and practice and to empower nurses as oral health advocates.

MATERIALS AND METHODS

This descriptive cross-sectional study was carried out at Krishna Vishwa Vidyapeeth University, Karad, with approval from the Institutional Ethics Committee. A total of 400 nursing students across B.Sc., Post-Basic B.Sc., and M.Sc. programs were recruited using stratified random sampling to ensure balanced representation of year of study. The inclusion criteria were enrollment in the nursing program and willingness to provide informed consent. Students with prior dental qualifications were excluded.

The data collection tool was a structured questionnaire developed in English and validated by experts in public health dentistry. It consisted of three domains: knowledge (6 questions), attitude (5 questions), and practice (4 questions). The survey was administered online through Google Forms. Anonymity was assured to reduce social desirability bias.

Data were exported to Microsoft Excel and analyzed using SPSS v26. Frequencies and percentages were calculated. Chi-

square tests were applied to assess associations between demographic variables (age, gender, year of study) and KAP outcomes. A p-value of <0.05 was considered statistically significant.

RESULTS

Demographic data showed that 200 students (50%) were aged 21–23 years, 100 (25%) were 18–20 years, 80 (20%) were 24–26 years, and 20 (5%) were 27 years or older. The sample included 240 males (60%) and 160 females (40%). In terms of academic status, 250 (62.5%) were B.Sc. nursing students, 100 (25%) were Post-Basic B.Sc. students, and 50 (12.5%) were M.Sc. nursing students.

Knowledge responses revealed that 300 (75%) identified twice-daily brushing as recommended, 220 (55%) reported brushing for 2–3 minutes, and 320 (80%) recognized smoking as a risk factor for gum disease. Attitudinal findings showed that 310 (77.5%) considered routine dental check-ups very important and 280 (70%) strongly agreed that oral health affects systemic health. However, practice responses lagged: 180 (45%) had visited a dentist within the last year, and only 150 (37.5%) regularly educated peers or patients on oral hygiene.

Associations were statistically significant between year of study and knowledge (χ^2=12.54, p=0.014), and between attitude and preventive practices (χ^2=18.72, p=0.003). Gender differences were not statistically significant.

Table 1. Demographic and KAP Summary of Nursing Students

Variable	n (%)
Age 18-20	100 (25.0%)
Age 21-23	200 (50.0%)
Age 24-26	80 (20.0%)
Age ≥27	20 (5.0%)
Gender Male	240 (60.0%)
Gender Female	160 (40.0%)
Year B.Sc Nursing	250 (62.5%)
Year P.B.B.Sc	100 (25.0%)
Year M.Sc Nursing	50 (12.5%)
Knowledge: Twice daily brushing	300 (75.0%)
Knowledge: 2–3 min duration	220 (55.0%)
Knowledge: Smoking causes gum disease	320 (80.0%)
Attitude: Dental check-ups very important	310 (77.5%)
Attitude: Oral care impacts wellness strongly agree	280 (70.0%)
Practice: Twice daily brushing	290 (72.5%)
Practice: Use of mouthwash	260 (65.0%)
Practice: Dental visit in last 12 months	180 (45.0%)
Practice: Explained oral hygiene tips regularly	150 7.5%)

Figures
Figure 1 illustrates brushing frequency. Figure 2 shows the distribution of attitudes towards routine check-ups, and Figure 3 demonstrates dental visits in the past year.

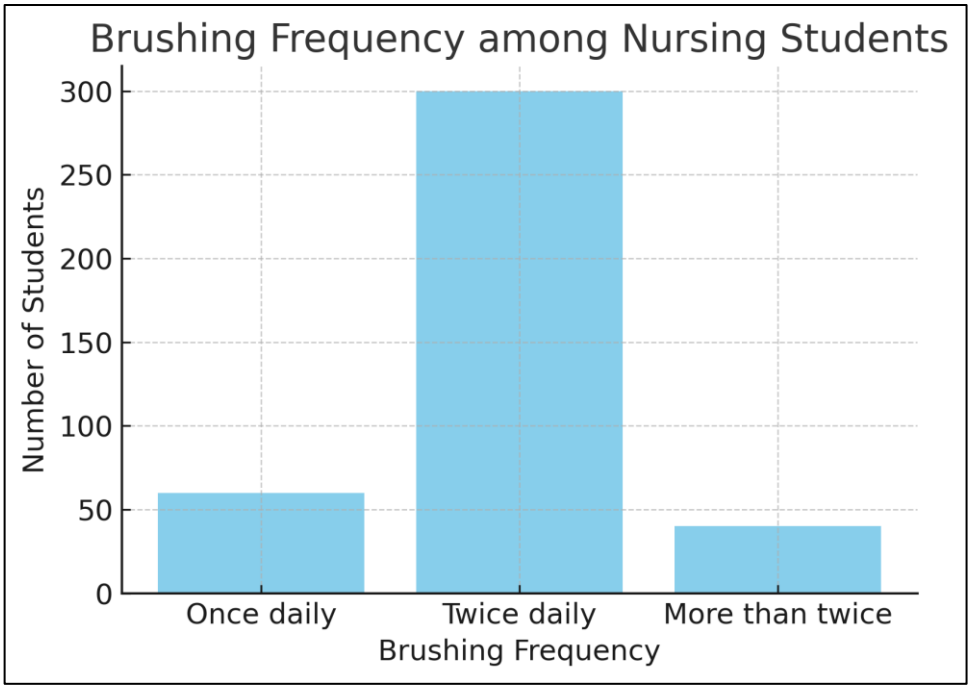

Figure 1: Brushing Frequency among Nursing Students.

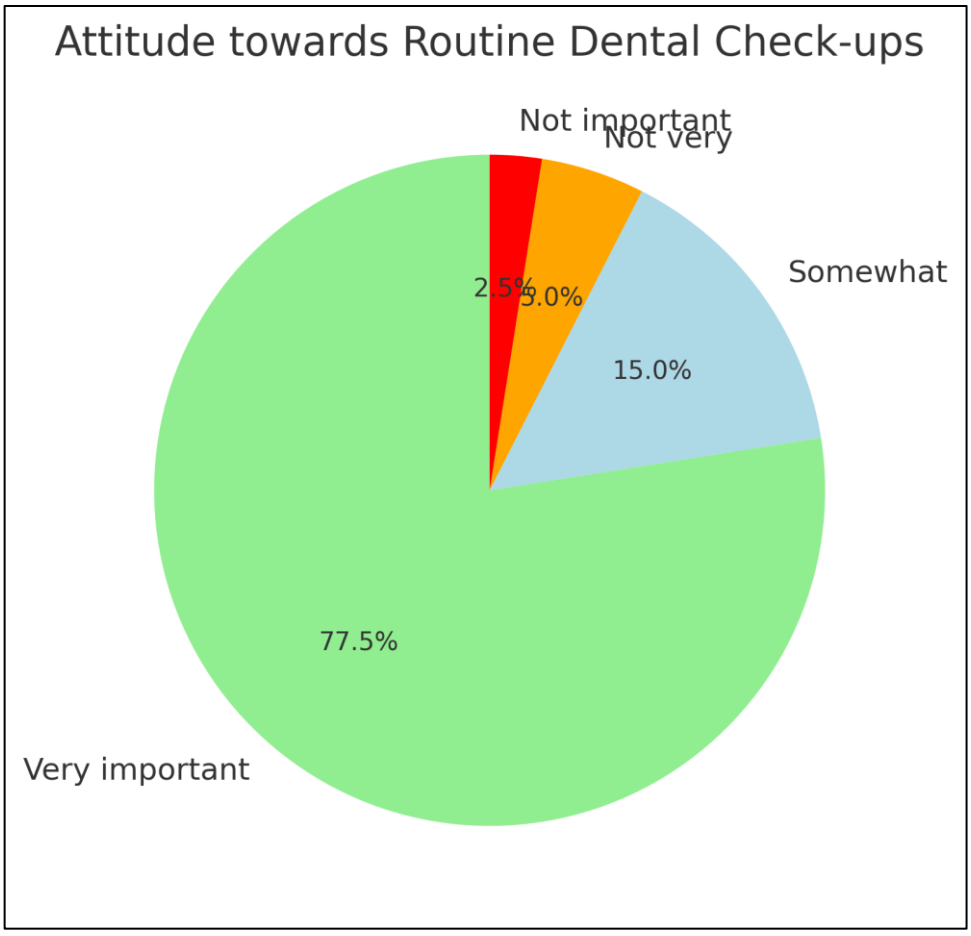

Figure 2: Attitudes towards Routine Dental Check-ups.

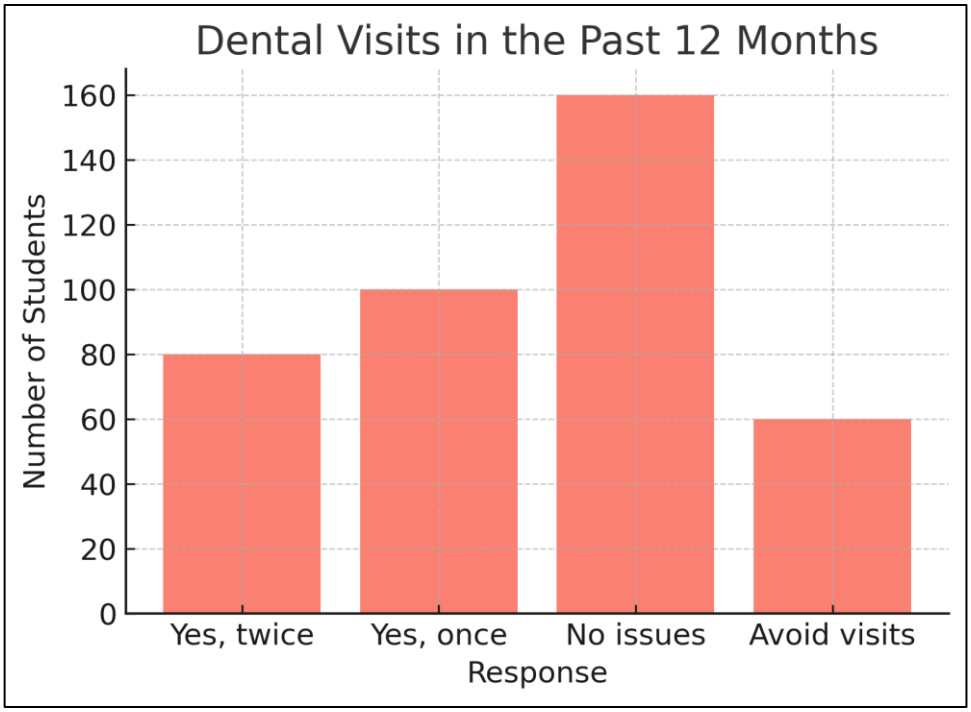

Figure 3: Dental Visits in the Past 12 Months.

DISCUSSION

The present study demonstrates a consistent knowledge–practice gap among nursing students. While most participants possessed satisfactory knowledge and favorable attitudes, their oral health practices, particularly dental visits and patient counseling, were less than optimal. These findings are aligned with previous Indian studies [6–10] and echo patterns reported internationally [11–15].

The strong knowledge levels regarding brushing frequency and smoking's impact on periodontal disease may reflect general public awareness campaigns and increased exposure through media. However, practices such as dental visits are influenced by behavioral, cultural, and systemic barriers. Students may perceive dental care as expensive, unnecessary without symptoms, or logistically challenging. These barriers have been documented in prior studies, including Yadav et al. (2019) [8] and Sharma et al. (2024) [10].

The significant association between year of study and knowledge suggests that curricular progression enhances awareness, likely through exposure to clinical postings and lectures. However, without explicit oral health training, this improvement is insufficient to shift behaviors. Similar conclusions were reached by Lakshmi et al. (2022) [9], who noted that attitudes mediated the translation of knowledge into behavior.

International studies also validate these trends. Tsui et al. (2023) [13] reported that ICU nurses' oral care practices in Hong Kong were limited by lack of guidelines and inadequate training. Iyer et al. (2023) [14] in Saudi Arabia and Alqaissi et al. (2025) [15] confirmed that knowledge alone does not translate into consistent care without institutional reinforcement. Marquès-Pellejà et al. (2023) [16] found that problem-based learning significantly improved oral health knowledge, supporting the need for innovative pedagogical methods. Onwubu et al. (2022) [17] and Sood et al. (2024) [18] similarly emphasized structured training and continuing education as key to behavioral adoption.

Collectively, the evidence underscores that oral health promotion requires more than factual instruction. Educational interventions should target attitudes, self-efficacy, and behavioral reinforcement. Problem-based learning, role modeling by faculty, simulation-based sessions, and interprofessional collaborations with dental departments may foster sustained behavior change. Moreover, institutional policies that mandate oral care guidelines in hospitals can further encourage adoption, as emphasized by Tsui et al. [13].

Future research should employ longitudinal designs to assess the long-term impact of curricular reforms and educational interventions. Combining self-reported questionnaires with objective oral health indices (e.g., plaque scores, DMFT index) would provide a more holistic picture of knowledge–practice alignment. Qualitative studies may also explore psychosocial barriers that prevent students from adopting optimal practices.

CONCLUSION

This cross-sectional survey of 400 nursing students revealed that while oral health knowledge and attitudes were encouraging, practices were inconsistent, highlighting the need for curricular reforms. Associations showed that academic year influenced knowledge and attitudes predicted practices, supporting the role of education and motivation. Integrating structured oral health training into nursing curricula, adopting innovative teaching strategies, and fostering interprofessional collaboration with dental professionals are critical. By equipping nursing students with skills and motivation to implement oral care, healthcare systems can address a major public health gap and improve holistic patient outcomes.

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