

# Assess oral health Knowledge attitude and practices among dental and nursing students

Running title: Oral health knowledge, attitudes and practices among dental and nursing students.

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## ABSTRACT

**Background:** Oral health is integral to general health and quality-of-life, yet oral diseases remain among the most prevalent non-communicable conditions worldwide. Health professional students represent the future workforce shaping prevention and care. Dental students undergo structured training emphasizing prevention, infection control, and patient education. Nursing students, although not primarily trained in dentistry, routinely provide bedside oral care and influence patient awareness. Comparing oral health knowledge, attitudes, and practices (KAP) between these groups offers insight into curricular strengths, gaps, and opportunities for interdisciplinary training.

**Methods:** A cross-sectional-questionnaire survey was conducted among 272 students (136 dental, 136 nursing). A structured, validated set of question assessed demographics, oral hygiene practices (brushing frequency, materials, adjunctive aids), knowledge (purpose of brushing, caries causation, effects of soft drinks, prevention of gingival bleeding), and attitudes (dental anxiety, cost-related avoidance). Responses were cleaned and analyzed descriptively. Frequencies and percentage were calculated for each group. Comparative results are stated in text, tables, and figures.

**Results:** Female predominance was noted in both groups (63.2% dental, 68.4% nursing). Dental students demonstrated stronger preventive knowledge: correct brushing purpose (97.8% vs. 78.7%), awareness of multifactorial caries causation (93.4% vs. 66.9%), and recognition of soft- drink effects (97.1% vs. 78.7%). Knowledge of gingival bleeding prevention was higher in dental students (83.8%) than nursing students (59.6%). Brushing twice daily was common but similar in both groups (59.6% vs. 58.1%). Adjunctive aid use differed: dental students reported more mouthwash use (68.4%), while nursing students used toothpicks more frequently (14%). Anxiety was greater among nursing students, with 19.1% reporting extreme anxiety compared with 10.3% of dental students. Cost-related avoidance was also higher among nursing students (36.8% vs. 26.5%).

**Conclusions:** Dental students exhibited superior knowledge and slightly stronger preventive practices, while nursing students demonstrated greater anxiety and cost-related avoidance.

Findings highlight the need to integrate structured oral health modules in nursing curricula, while reinforcing preventive practices and anxiety-reduction strategies in both groups. Interdisciplinary education and affordable student-focused preventive services could reduce disparities and enhance oral health promotion.

**Keywords:** dental students; nursing students; oral hygiene; oral health knowledge; oral health practices; dental anxiety; preventive dentistry

## INTRODUCTION

Oral diseases are a major global concern of public health, with nearly 3.5 billion people affected worldwide.<sup>[1]</sup> Untreated dental caries in permanent teeth is the most common condition globally, while periodontal diseases affect nearly 10% of the population severely.<sup>[2]</sup> The World Health Organization (WHO) emphasizes prevention as the cornerstone of oral healthcare, highlighting that cost-effective strategies such as regular toothbrushing with fluoride toothpaste, interdental cleaning, reduced sugar consumption, and routine dental check-ups can considerably decrease disease burden.<sup>[3,4]</sup>

Despite these recommendations, oral hygiene behaviors remain suboptimal among young adults, including health professional students. Toothbrushing once daily, irregular use of interdental aids, and high consumption of sugar-sweetened beverages are common in many populations.<sup>[5]</sup> Results from systematic reviews confirm that interdental devices such as interdental brushes or floss significantly improve gingival health compared to toothbrushing alone.<sup>[6,7]</sup> Moreover, sugar-sweetened beverages are a well-established risk factor for caries.<sup>[8]</sup>

Health professional students occupy a unique space in oral health promotion. Dental students, due to their curriculum, are expected to possess superior knowledge and preventive practices. Their training covers oral disease etiology, preventive measures, infection control, and patient education. Nursing students, however, while not trained in dentistry, frequently provide bedside care for patients—including oral care for hospitalized, elderly, and chronically ill individuals. Nursing curricula often underemphasize oral health, despite nurses' crucial role in holistic care.<sup>[9,10]</sup>

Comparisons of dental and nursing students' knowledge and practices are limited but reveal important differences. Dental students consistently demonstrate higher oral health knowledge, preventive behavior, and awareness.<sup>[11,12]</sup> Nursing students, in contrast, often report higher levels of dental anxiety and greater cost-related avoidance.<sup>[13,14]</sup> Both groups, however, may show inadequate adherence to interdental cleaning, with floss and interdental brush use rarely reaching optimal levels.<sup>[6,15]</sup> Dental anxiety is a barrier not only in patients but also in health professional students. Its prevalence varies but remains a common cause of avoidance and delayed care-seeking.<sup>[14]</sup> Cost remains another barrier, particularly for students from middle-income contexts.<sup>[16]</sup>

The present study aims to compare oral health knowledge, attitudes, and practices between dental and nursing students. Identifying differences can inform curricular reforms, promote interdisciplinary collaboration, and enhance preventive health promotion within both professions.

## METHODS

### Study Design and Participants

A cross-sectional, questionnaire-based survey was conducted among undergraduate, postgraduate dental and nursing students. A total of 272 participants completed the survey: 136 dental students and 136 nursing students. Participation was voluntary and anonymous.

### Instrument

The questionnaire was structured into four domains:

1. Demographics: gender, faculty (dental/nursing).
2. Oral hygiene practices: frequency of brushing, material used (toothbrush, toothpaste, toothpowder), and use of adjunctive aids (mouthwash, floss, toothpicks).
3. Knowledge: purpose of toothbrushing, causes of tooth decay, awareness of soft drink effects, and knowledge of gingival bleeding prevention.
4. Attitudes/barriers: anxiety about dental treatment, cost-related avoidance, and perception of preventive vs. treatment focus.

The instrument was adapted from previously validated KAP surveys used in health professional populations.<sup>[12,16]</sup>

### Data Collection

The questionnaire was distributed online via institutional platforms. Responses were recorded into a spreadsheet.

### Data Analysis

Responses were checked for comprehensiveness and harmonized (e.g., gender responses categorized as "Male," "Female," or "Other"). Descriptive analysis of data was done using frequencies and percentages. Comparisons were made between dental and nursing student groups.

### **Ethical Considerations**

Ethical clearance was obtained from the institutional review board. (115/2025-2026) Informed consent was implied through voluntary survey completion.

## **RESULTS**

A total of 272 students participated in the survey, comprising 136 dental and 136 nursing students.

### **Demographics:**

Among respondents, female students predominated in both groups, with a slightly higher proportion in nursing students. Male representation was lower, and only a small fraction identified as “other/unspecified” (Table 1). Gender distribution is illustrated in Figure 1A.

### **Knowledge:**

Dental students demonstrated superior knowledge compared with nursing students across all domains. Nearly all dental students correctly identified the preventive purpose of toothbrushing (97.8% vs. 78.7%), recognized dental caries as multifactorial (93.4% vs. 66.9%), and were aware of preventive strategies for gingival bleeding (83.8% vs. 59.6%). Awareness of the harmful effects of soft drinks was also higher in dental students (97.1% vs. 78.7%) (Table 1; Figure 1B).

### **Practices:**

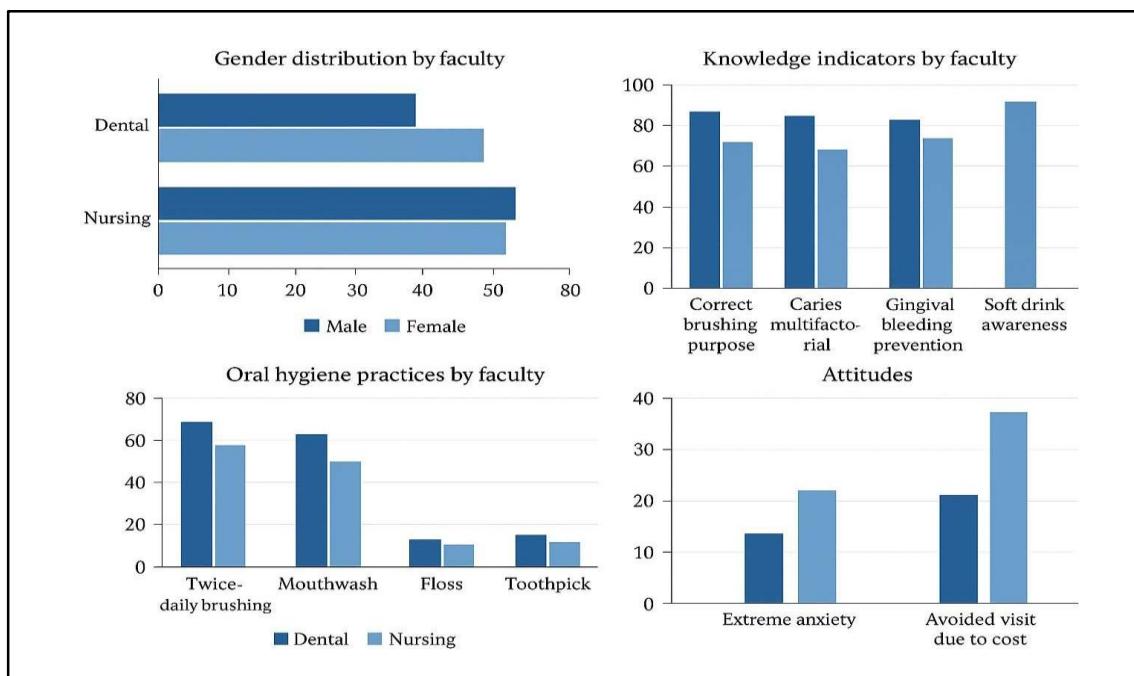
Oral hygiene practices showed both similarities and differences between groups. Twice-daily brushing was reported by approximately equal proportions of dental (59.6%) and nursing (58.1%) students. Toothbrush and toothpaste were universally used in both groups, though only nursing students reported using toothpowder. Use of adjunctive aids differed: dental students reported greater mouthwash use (68.4% vs. 57.4%), while nursing students repeatedly used toothpicks (14% vs. 8.1%) or reported no adjunctive practices (28.7% vs. 23.5%) (Table 1; Figure 1C).

### **Attitudes:**

Notable differences emerged in attitudes toward dental care. Nursing students reported a higher prevalence of extreme dental anxiety (19.1% vs. 10.3%) and greater cost-related avoidance of care (36.8% vs. 26.5%) compared with dental students. These findings highlight barriers that could influence both personal care-seeking and future promotion of oral health in clinical practice (Table 1; Figure 1D).

**Table 1. Consolidated comparison of demographics, knowledge, oral hygiene practices, and attitudes between dental and nursing students.**

Domain	Indicator	Dental (n=136)	Nursing (n=136)
Demographics	Male	47 (34.6%)	41 (30.1%)
Demographics	Female	86 (63.2%)	93 (68.4%)
Demographics	Other/Unspecified	3 (2.2%)	2 (1.5%)
Knowledge	Correct brushing purpose	133 (97.8%)	107 (78.7%)
Knowledge	Caries multifactorial	127 (93.4%)	91 (66.9%)
Knowledge	Gingival bleeding prevention	114 (83.8%)	81 (59.6%)
Knowledge	Soft drink awareness	132 (97.1%)	107 (78.7%)
Practices	Twice-daily brushing	81 (59.6%)	79 (58.1%)
Practices	Toothbrush + toothpaste	136 (100%)	134 (98.5%)
Practices	Mouthwash	93 (68.4%)	78 (57.4%)
Practices	Floss	18 (13.2%)	12 (8.8%)
Practices	Toothpick	11 (8.1%)	19 (14%)
Practices	None	32 (23.5%)	39 (28.7%)
Attitudes	Extreme anxiety	14 (10.3%)	26 (19.1%)
Attitudes	Avoided visit due to cost	36 (26.5%)	50 (36.8%)



**Fig 1: Comparative assessment of oral health knowledge, practices, and attitudes among dental and nursing students**

## DISCUSSION

This comparative analysis revealed clear differences between dental and nursing students. Dental students exhibited higher knowledge of preventive oral health measures, particularly regarding the purpose of brushing, caries causation, and the harmful effects of soft drinks. Nursing students, although reasonably aware, lagged in these domains. Preventive practices such as twice-daily brushing were similar, but nursing students showed lower use of adjunctive aids and higher reliance on toothpicks. Importantly, nursing students reported significantly greater dental anxiety and cost-related avoidance, which could influence their care-seeking behavior and future promotion of oral health in patient populations.

Our findings echo those of Marquès-Pellejà et al. <sup>[9]</sup> who found lower oral health knowledge in nursing compared to dental students in Spain. A recent BMC Nursing study <sup>[10]</sup> confirmed nursing students benefit significantly from targeted oral health modules, suggesting curricular deficits are a global phenomenon.

Regarding preventive practices, systematic reviews <sup>[6,7]</sup> demonstrate the importance of interdental cleaning, yet both groups in our study showed poor uptake. This highlights a universal gap in translating evidence into practice among young adults. Similar gaps were noted by Ng and Lim <sup>[15]</sup>, emphasizing the need for structured instruction.

Dental anxiety findings align with Silveira et al. <sup>[14]</sup>, who documented high prevalence of anxiety among health professional students, and Ahmed et al. <sup>[13]</sup>, who found nursing students in Saudi Arabia experienced higher anxiety compared with dental students.

Cost-related barriers are consistent with Mishra et al. <sup>[16]</sup>, who reported avoidance among Indian nursing students due to financial concerns. These systemic barriers persist despite growing awareness, underscoring the need for institutional support mechanisms.

### Educational implications

Findings of this study suggest several directions:

1. Integrating oral health modules into nursing curricula: Nursing students should receive structured education on prevention, oral-systemic links, and referral pathways.
2. Enhancing dental student training: Dental students' preventive knowledge is strong, but reinforcement of patient-centered communication, anxiety reduction, and cost-sensitivity is needed.

3. Interdisciplinary collaboration: Joint workshops between dental and nursing students may foster peer learning, reduce anxiety, and promote integrated care approaches.
4. Campus services: Affordable preventive care and anxiety management services should be available to all health professional students.

## **LIMITATIONS**

The cross-sectional design precludes causality. Self-reported measures may be subject to recall and desirability bias. The sample, though sizeable, was limited to one institution. No inferential statistics were applied; future work should include regression analyses to identify predictors of knowledge and behavior.

## **CONCLUSION**

Dental students demonstrated superior knowledge and preventive attitudes, while nursing students reported higher anxiety and cost barriers. Addressing these disproportions requires directed curricular reforms, interdisciplinary training, and structural support for affordable preventive care. Preparing both professional groups to collaboratively promote oral health is essential to improving population outcomes.

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