Perceived Oral Hygiene Status, Dental Service Utilization and Treatment Needs of Medical and Nursing Students at A Tertiary Institution in Nigeria: a Cross-sectional Study

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Key words: Perceived Oral Hygiene, Dental Utilization, Treatment Needs, Medical Students, Nursing Students

ABSTRACT

Objective

To evaluate the perceived oral hygiene status, dental service utilization, and treatment needs of medical and nursing students at a tertiary institution in Nigeria.

Methods:

This descriptive cross-sectional study was conducted among clinical medical and nursing students at the University of Port Harcourt. A semi-structured questionnaire was used to collect data on socio-demographic variables, perceived self-rated oral hygiene status, dental service utilization, and treatment needs. Statistical analysis was performed using SPSS version 25.0 (IBM SPSS Inc., Chicago, Illinois). Descriptive statistics were computed, and associations were tested using the chi-square test and Fisher's exact test where appropriate. A p-value < 0.05 was considered statistically significant.

Results:

A total of 155 participants were included, with 85 (54.8%) being clinical medical students and 70 (45.2%) being clinical nursing students. Only 6 (3.9%) of the medical students and 5 (3.2%) of the nursing students rated their oral hygiene as excellent. Dental clinic visits in the last 12 months were significantly higher among nursing students (50.0%) compared to medical students (32.9%), $p = 0.031$. More nursing students (67.1%) than medical students (49.4%) reported needing further dental treatment ($p = 0.034$). The most commonly required treatment was scaling and polishing.

Conclusion:

The overall perception of oral hygiene among participants was suboptimal. While half of the nursing students visited the dental clinic in the past year, a significant proportion of medical students did not. There is a need for improved oral health awareness and preventive dental care promotion among medical and nursing students.

INTRODUCTION

Oral health is an integral component of general health and well-being.[1,2] Dental plaque can lead to common oral diseases such as dental caries and periodontal diseases, which negatively impact quality of life. The maintenance of good oral hygiene through fluoride toothpaste use, flossing, and regular dental check-ups is essential for preventing these conditions.[3-5]

Dental care utilization has been defined as the number of dental care visits by an individual over a period of 12 months.[6] It is determined by the use of dental services and can be expressed in terms of dental visits made and treatment received over a specified period.[6,7] Regular utilization of dental care services and good oral hygiene knowledge have been linked to perceived self-rated oral health status (PSR-OHS).[8] The perceived self-rated oral health status has been reported as an important factor for a better quality of life.[9] It involves participants answering a survey questionnaire to assess and rate their own health as excellent, very good, good, fair, or poor.[7]

Preventive dental visits have been recommended by dental practitioners as a means of maintaining optimal oral health.[10] Despite recommendations for biannual dental visits, studies indicate that dental services are predominantly sought for symptomatic relief rather than for preventive care.[11] Several barriers, including lack of awareness, fear of dental procedures, and financial constraints, contribute to poor dental utilization, with dental pain being the most common reason.[11] Most reasons given for the non-utilization of dental services include not knowing there is a need for such services, unpleasant dental visits, and fear of the dentist.[12] Inadequate dental utilization and symptomatic treatment are not only common among patients but have also been found among medical professionals.[13]

A previous study by Gupta et al.[14] conducted among medical and nursing students of Raipur Institute of Medical Sciences, India, reported that 21.4% of the participants perceived their oral health status as excellent, and only 29.4% utilized dental care services in the last 12 months. Medical and nursing students, as future healthcare professionals, play a crucial role in oral health education. Their oral health behaviors and knowledge influence the advice they provide to patients.[15,16] However, studies have shown that even healthcare students have suboptimal dental care practices and utilization rates. This study therefore aims to assess the perceived oral hygiene status, dental service utilization, and treatment needs of clinical medical and nursing students at the University of Port Harcourt, Nigeria.

METHODS

Declarations: Ethical approval (UPTH/ADM/90/S.II/VOL.XI/1033) for the study was obtained from the Health Research and Ethics Committee of the University of Port Harcourt before commencement of the study. All participants provided informed consent prior to their participation in the study. The study was conducted and reported in accordance with the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines and in adherence to the Declaration of Helsinki.

Study Design and Setting:

This was a descriptive cross-sectional study conducted among clinical medical and nursing students at the University of Port Harcourt, located about 15 km away from Port Harcourt city, along the East-West Road in Obio/Akpor Local Government Area of Rivers State, Nigeria.

Sampling:

A two-stage sampling technique was employed:

1. Stratified Sampling: The Faculty of Clinical Sciences was selected from the four faculties in the College of Health Sciences.
2. Convenience Sampling: Clinical medical and nursing students were recruited based on their availability at the time of data collection.

Inclusion Criteria: Clinical medical and nursing students (years 4–6) at the University of Port Harcourt aged ≥18 years who provided informed consent.

Exclusion Criterion: Non-clinical students and students who declined participation.

Sample Size Determination:

The sample size was calculated using the Cochran formula, assuming a prevalence of 21.4% for perceived excellent oral health from a previous study.[14] Applying a correction factor for a population <10,000, the minimum required sample was 127 participants, however, 155 students participated.

Participant Characteristics:

Participants were clinical medical and nursing students; clinical medical students are undergraduate students studying Medicine and Surgery who are on clinical rotations with hands-on experience with patients, while clinical nursing students are undergraduate nursing students on clinical rotations. Inclusion criteria included clinical medical and clinical nursing students of the University of Port Harcourt.

Data Collection and Reliability Testing:

A semi-structured, self-administered questionnaire was used for data collection, consisting of three sections:

- Section A: Socio-demographic characteristics.
- Section B: Perceived oral hygiene status (rated as Excellent, Good, Fair, or Poor).
- Section C: Dental utilization in the previous 12 months and treatment needs. Data were collected between January 2021 and March 2021.

Study Independent Variables:

The study used two independent variables: Perceived self-rated oral hygiene status and treatment needs of participants. Perceived self-rated oral hygiene status (PSR-OHS) involves participants answering a survey questionnaire to assess and rate their own health as excellent, very good, good, fair, or poor.[7] This perceived self-rated oral health tool has been utilized in epidemiological studies to monitor health services and to upgrade oral health. It is also necessary in recognizing the significance of regular dental check-ups, treatment needs, and collecting information related to oral health.[9]

Data Collection Procedures:

Participants were asked about their perceived self-rated oral hygiene status (PSR-OHS) with five rated responses:

1. Excellent
2. Good
3. Fair
4. Poor
5. No response

Participants were also asked about their treatment needs by asking, "Do you need any further dental treatment?" This had three responses:

1. Yes
2. No
3. No response

Participants were further asked to specify what treatments were needed by asking, "If yes, what treatment do you need?" This had nine responses:

1. Cleaning of teeth/Scaling and polishing
2. Root canal treatment
3. Extraction
4. Fillings
5. Partial dentures
6. Orthodontics treatment
7. Crown preparation
8. Advanced restorations (Bridge, Implants)
9. No treatment needed

Dependent Variable

The dependent variable was the comparison of the participants' perceived self-rated oral hygiene status (PSR-OHS) to dental service utilization. Dental utilization was assessed by asking the question: "Have you visited the dental clinic in the last 12 months?" This had two responses:

1. Yes
2. No

Data Sources

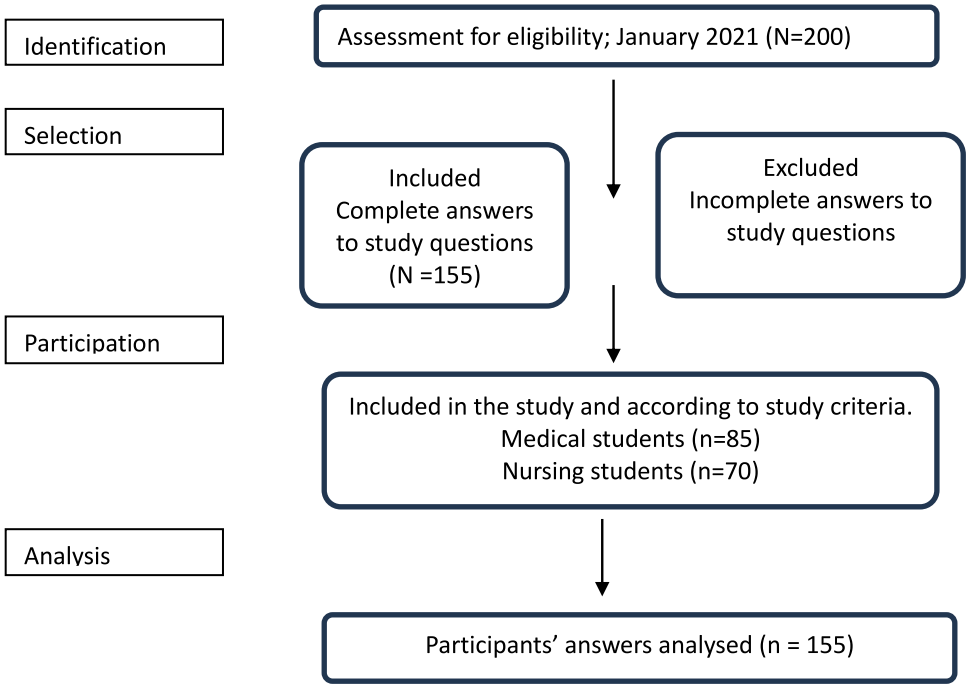
Two hundred questionnaires were administered, but 155 were correctly filled, giving a response rate of 77.5%; missing data were deleted. A semi-structured, self-developed questionnaire was used for data collection. The questionnaire had three sections:

Section A included information on participants' socio-demography (age, gender, marital status) and level of study.

Section B included information on perceived oral hygiene status.

Section C included information on dental utilization by the participants within the last 12 months, treatment received, and perceived treatment needs.

Participants' STROBE flowchart



Validation of Study Instrument

Following face validity assessment by the research team, the questionnaire was pretested on clinical dental students at the University of Port Harcourt, Rivers State, to evaluate simplicity and comprehension. Internal consistency was confirmed with a Cronbach's α of 0.77.

Statistical Analysis

Data were analyzed using IBM SPSS Statistics v25.0 (IBM Corp., Armonk, NY). Descriptive statistics (means, standard deviations, proportions) summarized continuous and categorical variables. Comparative analyses included: Continuous variables: Independent t-tests for two-group comparisons.

Categorical variables: Frequencies and percentages; Chi-square tests or Fisher's exact tests (for small cell counts). Statistical significance was set at $p < 0.05$.

RESULTS

Sociodemographic Characteristics

A total of 155 clinical medical (54.8%, n = 85) and nursing (45.2%, n = 70) students participated. The overall age range was 19–35 years (mean = 23.31 ± 2.50), with 63.2% female and 36.8% male participants.

Medical students: Age range 20–29 years (mean = 23.46 ± 1.98).

Nursing students: Age range 19–35 years (mean = 23.20 ± 2.98). Demographic details are summarized in Table 1.

Table 1: Sociodemographic variables of participants (N=155)

Sociodemographic Variables		N	%
Age group	18-24	111	(71.6)
	25-35	44	(28.4)
Gender	Female	98	(63.2)
	Male	57	(36.8)
Level	200	6	(3.8)
	300	11	(7.0)
	400	16	(10.2)
	500	89	(56.7)
	600	33	(21.0)
Marital status	Single	139	(89.7)
	Married	16	(10.3)

Perceived Self-Rated Oral Hygiene Status (PSR-OHS) of Participants

Participants rated their oral hygiene status as follows:

- Excellent: 11 (7.1%)
- Good: 101 (65.2%)
- Fair: 31 (20.0%)
- Poor: 10 (6.5%)
- No response: 2 (1.3%). The distribution of responses is illustrated in Figure 1.

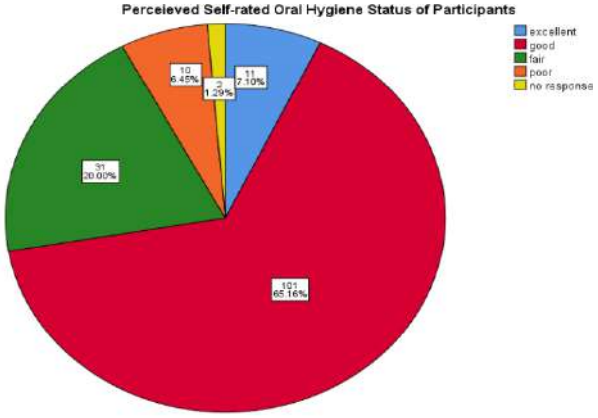
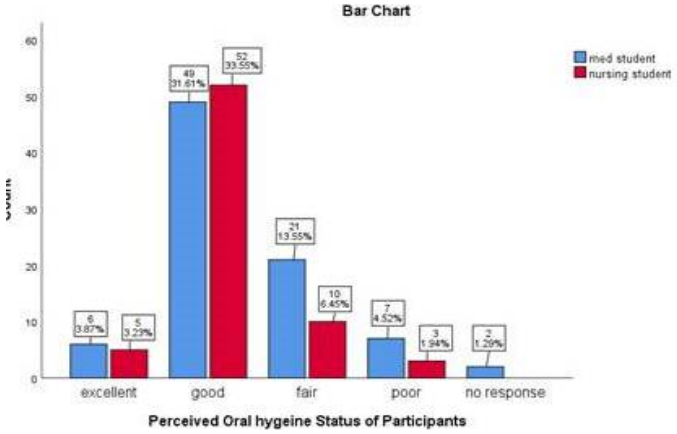


Figure 1: Perceived self-rated oral hygiene status (PSR-OHS) of participants

Perceived Self-Rated Oral Hygiene Status (PSR-OHS) of Medical and Nursing Students

Only a small proportion of students rated their oral hygiene as excellent—3.9% (n=6) of medical students and 3.2% (n=5) of nursing students. A higher percentage reported good oral hygiene, with 31.6% (n=48) of medical students and 33.6% (n=52) of nursing students falling into this category. Meanwhile, a minority rated their oral hygiene as poor—4.5% (n=7) of medical students and1.9% (n=3) of nursing students. (Figure 2)

(Figure 2.Figure 2- Perceived self-rated oral hygiene status (PSR-OHS) of medical and the nursing students



Dental Service Utilization (Past 12 Months): A higher proportion of nursing students (50.0%, n=35) visited a dental clinic last years compared to medical students (32.9%, n=28) ($p = 0.031, \chi^2(1) = 4.630$).

Treatment Needs: Need for Treatment: A greater percentage of nursing students (67.1%, n=47) required dental treatment compared to medical students (49.4%, n=42) ($p = 0.034$).

Most Common Required Treatments:

- Scaling and polishing (73.0%)
- Root canal treatment (7.0%)
- Tooth extractions (5.0%)

Among students who visited the dental clinic:

*Medical Students: 78.6% (=22) had scaling

*Nursing Students: 48.6% (n=17) received scaling

*45.7% (16) attended for toothache (Fisher's exact test = 14.950, p = 0.001) ÿ

Among non-attendees:

* MedicalStudents: 61.4%(35) lack of time (main)

* Nursing Students: 48.6% (17) cited lack of time

Perceived Need for Further Treatment

*Medical students: 49.4% (42) acknowledged need

* Nursing students 67.1% (47) acknowledged neeed

(Fisher's exact test = 5.434, p=0.034)

Among those requiring additional treatment:

Medical Students:

- Scaling and polishing: 92.9% (n=39)
- Root canal treatment, extraction, and orthodontic treatment: 2.4% (n=1) each.
- Nursing Students:
- Scaling and polishing: 72.3% (n=34)
- Root canal treatment: 12.8% (n=6) (Fisher's exact test = 9.463, p = 0.028).

Table 2- Dental service utilization and treatment needs of participants

VARIABLES		MEDICAL STUDENTS n (%)	NURSING STUDENTS n (%)	P VALUE
Dental service utilization in the last 12 months?	Yes	28(32.9)	35(50.0)	0.031*
	No	57(67.1)	35(50.0)	
If yes, reasons for dental visitation	Scaling & polishing	22(78.6)	17(48.6)	0.001*#
	Toothache	1(3.6)	16(45.7)	
	Extraction	4(14.3)	2(5.7)	
	Orthodontic treatment	1(3.6)	0(0.0)	
If no, reasons for not visiting the dentist	Fear of dental treatment	5(8.8)	6(17.1)	0.220
	Cost of treatment	14(24.6)	12(34.3)	
	No time	35(61.4)	17(48.6)	
	No response	3(5.3)	0(0.0)	
Do you need further dental treatment?	Yes	42(49.4)	47(67.1)	0.034*#
	No	42(49.4)	23(32.9)	
	No response	1(1.2)	0(0.0)	
If yes, what dental treatment do you need?	Scaling & polishing	39(92.9)	34(72.3)	0.028*#
	Root canal treatment	1(2.4)	6(12.8)	
	Extraction	1(2.4)	4(8.5)	
	Fillings	0(0.0)	3(6.4)	
	Orthodontic treatment	1(2.4)	0(0.0)	
	TOTAL	42(100.0)	47(100.0)	

*-Statistically significant #- Fischer's exact

Association of Perceived Oral Hygiene Status (PSR-OHS) with Dental Service Utilization and Treatment Needs

Dental Service Utilization by PSR-OHS

A small proportion of participants who rated their oral hygiene as excellent (4.8%, n=3) visited a dental clinic in the past 12 months, compared to those with good (66.7%, n=42) or poor (4.8%, n=3) self-rated hygiene. This association was not statistically significant (Fisher's exact test = 1.657, p = 0.831).

Among those who visited the dental clinic, Scaling and polishing was most common among participants with good oral hygiene (64.1%, n=25). Toothache was the primary reason for visits among those with fair (17.6%, n=3) and poor (11.8%, n=2) oral hygiene. This finding was not statistically significant (Fisher's exact test = 14.741, p = 0.233).

Reasons for Not Visiting the Dental Clinic

Among non-attendees:

- Fear of dental treatment was reported by 81.1% (n=9) with good and 18.9% (n=2) with fair oral hygiene.
- Cost barriers were cited by:
- 11.5% (n=3) with excellent hygiene,
- 50.0% (n=13) with good hygiene,
- 23.1% (n=6) with poor hygiene.
- Lack of time was reported by 67.3% (n=35) with good and 1.9% (n=1) with poor hygiene.
- These associations were not statistically significant (Fisher's exact test = 15.670, p = 0.190).

Perceived Need for Further Treatment

Agreement on needing treatment varied by PSR-OHS:

- Excellent: 7.9% (n=7),
- Good: 64.0% (n=57),
- Fair: 22.5% (n=20),
- Poor: 4.5% (n=4).

No perceived need for treatment was reported by:

- 6.2% (n=4) with excellent hygiene,
- 67.2% (n=44) with good hygiene,
- 9.2% (n=6) with poor hygiene.

This finding was statistically significant (Fisher's exact test = 79.481, p = 0.008).

Among those who acknowledged needing further treatment:

Scaling and polishing was requested by:

- 6.8% (n=5) with excellent hygiene,
- 24.7% (n=18) with fair hygiene,
- 4.1% (n=3) with poor hygiene.

Root canal treatment was needed by:

- 85.7% (n=6) with good hygiene,
- 14.3% (n=1) with poor hygiene.

Extraction was required by:

- 80.0% (n=4) with good hygiene,
- 20.0% (n=1) with fair hygiene.

This association was not statistically significant (Fisher's exact test = 23.345, p = 0.194).

Table 3: Association of perceived oral hygiene status (PSR-OHS) of participants with dental service utilization and treatment needs

Variables		Perceived oral hygiene status Excellent n (%)	Good n (%)	Fair n (%)	Poor n (%)	No response n (%)	TOTAL	P VALUE
Dental visitation in the last 12 months	Yes	3(4.8)	42(66.7)	14(22.2)	3(4.8)	1(1.6)	63(100.0)	0.831#
	No	8(8.7)	59(64.1)	17(18.5)	7(7.6)	1(1.1)	92(100.0)	
If yes, reasons for dental visitation	Scaling &polishing	3(7.7)	25(64.1)	10(25.6)	1(2.6)	0(0.0)	39(100.0)	0.233#
	Toothache	0(0.0)	12(70.6)	3(17.6)	2(11.8)	0(0.0)	17(100.0)	
	Extraction	0(0.0)	4(66.7)	1(16.7)	0(0.0)	1(16.7)	6(100.0)	
	Orthodontic treatment	0(0.0)	1(100.0)	0(0.0)	0(0.0)	0(0.0)	1(100.0)	
If no, reasons for not visiting the dentist	Fear of dental treatment	0(0.0)	9(81.1)	2(18.9)	0(0.0)	0(0.0)	11(100.0)	0.190#
	Cost of dental treatment	3(11.5)	13(50.0)	4(15.4)	6(23.1)	0(0.0)	26(100.0)	
	No time	5(9.6)	35(67.3)	10(19.2)	1(1.9)	1(1.9)	52(100.0)	
	No response	0(0.0)	2(66.7)	1(33.3)	0(0.0)	0(0.0)	3(100.0)	
Do you need any further dental treatment	Yes	7(7.9)	57(64.0)	20(22.5)	4(4.5)	1(1.1)	89(100.0)	0.008*#
	No	4(6.2)	44(67.2)	11(16.9)	6(9.2)	0(0.0)	65(100.0)	
	No response	0(0.0)	0(0.0)	0(0.0)	0(0.0)	1(100.0)	1(100.0)	
If yes, what dental treatment do you need?	Scaling &polishing	5(6.8)	46(63.0)	18(24.7)	3(4.1)	1(1.4)	73(100.0)	0.194#
	Root canal treatment	0(0.0)	6(85.7)	0(0.0)	1(14.3)	0(0.0)	7(100.0)	
	Extraction	0(0.0)	4(80.0)	1(20.0)	0(0.0)	0(0.0)	5(100.0)	
	Filling	2(66.7)	1(33.3)	0(0.0)	0(0.0)	0(0.0)	3(100.0)	
	Orthodontic treatment	0(0.0)	0(0.0)	1(100.0)	0(0.0)	0(0.0)	1(100.0)	

*- Statistically significant. #- Fischer exact

DISCUSSION

Findings:

This study highlights low perceived oral hygiene status and suboptimal dental service utilization among medical and nursing students at the University of Port Harcourt. This is concerning because knowledge of oral health and adherence to healthy oral hygiene practices are crucial in reducing the prevalence of oral diseases.[17] Students represent a significant segment of society, and their behavior can influence broader societal oral health practices.[18] Therefore, this study assessed the perceived oral hygiene status of medical and nursing students in relation to their dental service utilization and treatment needs.

Most participants rated their oral hygiene as "good" rather than "excellent," aligning with previous findings[14] but contrasting with a study among nursing students in Benin City, Nigeria, where most rated their hygiene as "fair."[19] This discrepancy suggests that many participants in this study lacked confidence in their oral hygiene status.

Dental service utilization varied among participants. Only a few medical students and half of the nursing students had visited a dentist in the past 12 months. This finding is consistent with a study by Gupta[14] among medical and nursing students in India, where fewer than half had visited a dental clinic in the previous year. Conversely, Onigbinde et al.[20] reported that most medical and nursing students had never visited a dentist, indicating a lack of appreciation for oral health.

Differences were also observed in the types of dental services accessed. A high proportion of medical students underwent scaling and polishing, whereas nursing students primarily sought treatment for toothache and other dental issues. This aligns with findings by Okeigbemen et al.,[19] where nurses visited dentists mainly due to toothache. This suggests that medical students may prioritize preventive care more than nursing students, who tend to seek symptom-oriented treatment.

The primary reason for not utilizing dental services was a lack of time, reported by both medical and nursing students. This contrasts with a study by Ajayi et al.[21] among University of Benin undergraduates, where most participants cited no perceived need for dental visits. Similarly, Okoroafor et al.[22] found that lack of perceived need and time constraints were common barriers among University of Calabar students. These findings imply that individuals in developing countries often prioritize treatment over preventive dental care.[23]

About half of the medical students and a significant proportion of nursing students acknowledged needing further treatment. Most medical students who consented to additional treatment required scaling and polishing, while nursing students reported needing various treatments, including root canal therapy and extractions. This further underscores the medical students' greater awareness of preventive care.

Perceived self-rated oral health status (PSR-OHS) and oral health literacy were also assessed. PSR-OHS is a quick oral health evaluation tool linked to better oral health literacy and regular dental visits.[24] Surprisingly, most participants who rated their oral hygiene as "excellent" had not visited a dentist in the past year for scaling and polishing. Notably, those with "excellent" self-ratings had never undergone dental treatment, which may have influenced their perception. This group may require further dental education, as only a few recognized the need for scaling or other treatments.

Regular scaling and polishing (recommended every six months) enable early diagnosis and treatment of dental issues.[25] Most participants with "good" self-rated oral hygiene had undergone scaling and polishing and acknowledged needing further treatment. In contrast, those with "poor" self-ratings showed limited awareness, as few had sought scaling or additional treatment. This highlights the need for enhanced oral health education among medical and nursing students.

In summary, dental service utilization in this study (32.9% for medical, 50.0% for nursing students) was higher than in other Nigerian studies, where most students had never visited a dentist. The demand for scaling and polishing reflects some awareness of preventive care, but utilization remains insufficient. Identified barriers included lack of time (52%), dental anxiety (12%), and cost concerns (16%).

Implications:

Despite relatively higher utilization rates, these findings underscore the need to promote dental visits among medical and nursing students. Addressing time constraints and financial barriers could improve access to dental care.

Trade-offs (Implications)

- Cross-sectional design: Prevents causal inferences.
- Convenience sampling: Limits generalizability.
- Unassessed factors: Toothbrushing patterns and duration, critical determinants of oral hygiene, were not examined.
- Self-reported data: Potential for recall and social desirability bias.

Take-home (Conclusions)

- Most medical and nursing students perceived their oral hygiene as "good" rather than "excellent."
- Nursing students utilized dental services more, but overall rates remained suboptimal.

- Preventive dental visits should be encouraged, as most students seek care only for symptomatic relief.

Expectations for Future Research:

Future studies could investigate whether dental service utilization among medical and nursing students influences their future patient referral practices.

Recommendations

1. Integrate oral health education into medical and nursing curricula.
2. Universities should facilitate routine dental check-ups for students.

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Conflicts of interest:

Authors declare no conflicts of interest.

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