Original Article

Oral Hygiene–Related Knowledge, Attitude, and Practices among Student Nurses in a Teaching Health Institution

Omokhua Aigbe Harrison[1], Aiyanyor Gloria[2], Anene Jennifer[2]

[1]Departments of Restorative Dentistry, University of Benin & University of Benin Teaching Hospital. Benin City, Edo state. Nigeria. [2]Department of Dental Surgery Technicians
University of Benin Teaching Hospital, Benin City.

ABSTRACT

Introduction: Oral health is an important aspect of general health. A healthy mouth is a key element to improving the quality of life of an individual. Good oral hygiene can be achieved by regular visits to the dental clinic, regular brushing of the teeth at least twice daily, and maintaining other oral hygiene practices. Knowledge, attitude, and practice of good oral hygiene are essential indicators of a healthy mouth. Having a busy student life should not be an excuse to neglect the practice of good oral hygiene. Materials and Methods: A cross-sectional study was carried out using a structured questionnaire. Data were analyzed with SPSS version 23 using descriptive statistics and chi-square tests at $p < 0.05$. Results: Most respondents were aged 18–21 years (54.4%), female (70.9%), and in Year 3 (35.9%). The Mean ± SD years of the respondents was 21.39 ± 2.41 years. Conclusion: Although students showed good knowledge and attitudes, there were gaps in practice, emphasizing the need for improved oral health education during training.

Keywords: Oral Hygiene, Knowledge, Attitude, Practice, Nursing Students.

Introduction

Oral hygiene is related to every aspect of our lives, but is often taken for granted.[1] Our mouth is the gateway to our body's health. [2] It can show signs of nutritional deficiencies or general health conditions. Regardless of age, maintaining good oral hygiene is essential. Oral hygiene is a vital aspect for everyone, including nursing students.[3] Having a busy student life should not be an excuse to neglect the practice of good oral hygiene. It is especially important for students in health-related courses.[3] After completing their studies, nursing students will serve as role models in the community, and proper oral care is essential to encourage others to look after their oral hygiene.[4] Good oral hygiene practice is closely linked to knowledge and behaviour towards it. Awareness of one's oral health status leads to better oral hygiene practices. However, even with knowledge, without the right attitude and habits, oral hygiene may be inadequate [5,6] The consequences of poor oral hygiene practices should be understood by everyone. As students, they will eventually interact with many people from diverse cultures, age groups, and backgrounds. With proper knowledge, good oral hygiene behaviour, and a positive attitude, they can act as role models for their families and the wider community.[7] There are various ways to maintain good oral hygiene. Numerous proven techniques positively impact oral health. One of the key practices is tooth brushing.[8] The recommended method by the American Dental Association (ADA) is to place the toothbrush at a 45º angle against the gums and move it back and forth in short strokes. [9] Brushing the tongue can also help remove bacteria and freshen breath.[10] Using a mouth rinse or mouthwash, alongside daily brushing and flossing, enhances oral hygiene.

Correspondence to:

Dr HA Omokhua
Department of Restorative Dentistry,
The University of Benin,
Benin City, Edo state
Nigeria.
email: Harrison.omokhua@uniben.edu

Antimicrobial mouthwashes help reduce bacteria and plaque activity, which can cause gingivitis and gum disease.[10] Fluoride mouth rinses can also help prevent tooth decay. Furthermore, reducing the consumption of sweetened drinks can benefit oral health. [11] The knowledge, attitude, and practice of oral hygiene are vital among students across different disciplines, such as Dentistry, Pharmacy, Medicine, Business, and Biotechnology. This research aimed to evaluate the knowledge, attitudes, and practices regarding oral hygiene among nursing students in a tertiary health facility.

Materials and Methods

Study Area

This study was conducted at the School of Nursing, University of Benin Teaching Hospital (UBTH), Benin City, Edo State, Nigeria. Benin City comprises three local government areas: Egor, Oredo, and Ikpoba-Okha. Edo State is located in the South-South geopolitical zone of Nigeria and lies between longitudes 5°E and 6.45°E, and latitudes 6.1°N and 7.30°N, covering a total land area of 19,281.93 km².

Study Design

A cross-sectional descriptive survey design was employed for this study.

Study Population

The study population comprised nursing students enrolled at the School of Nursing, University of Benin Teaching Hospital, Benin City.

Inclusion Criteria

All consenting nursing students of the University of Benin Teaching Hospital who completed the questionnaires appropriately were included in the study.

Sample Size Determination

The minimum sample size was determined using the formula for cross-sectional studies with qualitative outcomes, as described by Lemeshow et al. [12]
n=Zα2P(1−P) d2n = \frac{Z_\alpha^2 P (1 - P)}{d^2}n=d2Zα2P(1−P)
Where:

n = required minimum sample size

Zα = standard normal deviate corresponding to the desired confidence level (1.96 for 95%)
P = estimated proportion of students with good oral health practices. [13]
d = desired level of precision (0.08)

Substituting the values:
n= (1.96)2×0.21×0.79(0.08)2=99n = \frac{(1.96)^2 × 0.21 × 0.79}{(0.08)^2} = 99n=(0.08)2(1.96)2×0.21×0.79=99

To account for a 10% non-response rate, the sample size was adjusted using the formula:
n′=n1−r=991−0.10=110n' = \frac{n}{1 - r} = \frac{99}{1 - 0.10} = 110n′=1−rn=1−0.1099=110

Thus, an adjusted sample size of 110 was used for the study.

Sampling Technique

A convenience sampling technique was adopted to select 110 nursing students from the School of Nursing, University of Benin Teaching Hospital.

Ethical Considerations

Participation in the study was voluntary, and informed consent was obtained from all participants. Anonymity and confidentiality were ensured, as no personal identifiers were included on the questionnaires. Completed questionnaires were stored securely, and only the researchers had access to the data. The study posed no physical or psychological risk to participants. Questionnaires were administered during students' free lecture periods to avoid disruption of academic activities. Participants were informed of their right to withdraw at any time without penalty.

Data Collection Instrument

Data were collected using a structured, self-administered questionnaire consisting of both closed- and open-ended questions, divided into four sections:

- Section A: Demographic data and general information
- Section B: Oral health knowledge
- Section C: Attitudes towards oral hygiene
- Section D: Oral hygiene practices

Before the main data collection, the questionnaire was pre-tested on 20 students from other departments of the Institute of Health Technology (IHT) to assess clarity and reliability. Necessary modifications were made based on

the pre-test feedback before administration to the study participants.

Assessment of the practice of oral hygiene was done by awarding every correct response a score of 1 and every incorrect response a score of 0. The highest possible score obtainable was 12, and the lowest possible score obtainable was 0. All scores obtained were summed up and converted to a percentage, which was graded using formats reported in previous studies;[9,10]

Scoring and grading of Practice

Less than or equal to 50%=Poor practice
51-69%=Fair practice
70% and above=Good practice

Attitude was assessed using a 5-point Likert scale. Positive statements were scored from 5 (strongly agree) to 1 (strongly disagree), while negative statements were reverse-scored. The total attitude score ranged from 10 to 50. Respondents scoring 70% and above were categorized as having a positive attitude, while those scoring below 70% were considered to have a negative attitude.

Data Management and Analysis

Collected data were coded, entered, cleaned, and analysed using the Statistical Package for the Social Sciences (SPSS), version 23. Descriptive statistics, including means and standard deviations for continuous variables and frequencies and percentages for categorical variables, were computed. Associations between categorical variables were evaluated using the Chi-square (χ^2) test, with statistical significance set at $p < 0.05$.

RESULTS

Table 1: Sociodemographic characteristics of respondents

Variable	Frequency (N = 103)	Percent (%)
Age in years		
18 - 21 years	56	54.4
22 - 25 years	43	41.7
26 - 29 years	2	1.9
30 - 33 years	2	1.9
Mean ± SD years	21. 39 ± 2.4	
Gender		
Male	30	29.1
female	73	70.9
Level of Study		
Year-1	31	30.1
Year-2	35	34.0
Year-3	37	35.9

A higher proportion, 54.4% (n = 56) of the respondents were between 18 – 21 years of age, while 43 (41.7%) respondents were between 22 – 25 years of age. The Mean ± SD years of the respondents was 21.39 ± 2.41 years. The majority, 70.9% (n=73) of the respondents were female, while 30 (29.1%) respondents were male. A higher proportion, 35.9% (n = 37) of the respondents were in level 300 (Year 3), while 35 (34.0%) respondents were in level 200 (Year 2).

Table 2: Knowledge of Oral Hygiene among respondents

Variable	Frequency (N = 103)	Percent (%)
What is dental plaque?		
Build-up of bacterial	45	43.7
Build-up of calculus (calcified plaque)	4	3.9
Discoloured tooth surface	8	7.8
I don't know	46	44.7
Does plaque (soft debris) accumulate on tooth surfaces after brushing		
Yes	18	17.5
No	32	31.1
I don't know	53	51.5
Plaque could lead to dental caries		
Yes	35	33.9
No	23	22.3
I don't know	45	43.7
Brushing teeth prevents tooth decay		
Yes	86	83.5
No	6	5.8
I don't know	10	9.7
What causes tooth decay		
Worms	41	39.8
Magic	3	2.9
Sugar	52	50.5
I don't know	6	5.8
Others	1	1.0

A higher proportion,44.7% (46) of the respondents did not know what dental plaque is, while 45 (43.7%) respondents knew that dental plaque is a build-up of bacteria. A little over half, 51.5% (53) of the respondents did not know if plaque (soft debris) accumulates on tooth surfaces after brushing or not while 18 (17.5%) respondents knew. A third, 33.9% (35) of the respondents agreed that plaque could lead to dental caries. The majority, 83.5% (86) of the respondents, agreed that brushing teeth prevents tooth decay. A higher proportion, 50.5% (52) of the respondents, agreed that sugar causes tooth decay.

Table 3: Relationship between Socio-demographic Characteristics and Attitude towards Oral hygiene

Characteristics	Attitude towards Oral Hygiene		Test statistic	p-value
	positive n (%)	negative n (%)		
Age group (years)				
18 - 21 Years	51 (91.1)	5 (8.9)	Fisher's Exact = 11.405	0.004
22 - 25 Years	32 (74.4)	11 (25.6)		
26 - 29 years	0 (0.0)	2 (100.0)		
30 - 33 years	2 (100.0)	0 (0.0)		
Gender				
Male	25 (80.6)	6 (19.4)	Fisher's Exact = 7.304	0.026
Female	46 (63.0)	27 (37.0)		
Study Level				
Year-1	26 (83.9)	5 (16.1)	χ^2= 0.095	1.000
Year-2	29 (82.9)	6 (17.1)		
Year-3	30 (81.1)	7 (18.9)		
Father's Occupation				
Senior civil servant	42 (77.8)	12 (22.2)	Fishers Exact Test = 3.150	0.523
Junior civil servant	16 (80.0)	4 (20.0)		
Small scale self-employed	10(100.0)	0 (0.0)		
Large scale self-employed	13 (86.7)	2 (13.3)		
Unemployed	4 (100.0)	0 (0.0)		
Mother's Occupation				
Senior civil servant	28 (75.7)	9 (24.3)	Fishers Exact Test = 12.991	0.012
Junior civil servant	10 (71.4)	4 (28.6)		
Small scale self-employed	19(100.0)	0 (0.0)		
Large scale self-employed	23 (92.0)	2 (8.0)		
House wife	1 (33.3)	2 (66.7)		
Unemployed	4 (80.0)	1 (20.0)		
Highest Education Level of Father				
No formal education	0 (0.0)	0 (0.0)	Fishers Exact Test = 2.496	0.306
Primary school	7 (87.5)	1 (12.5)		
Secondary school	24 (92.3)	2 (7.7)		
Tertiary school	54 (78.3)	15 (21.7)		
Highest Education Level of Mother				
No formal education	2 (100.0)	0 (0.0)	Fishers Exact Test = 9.994	0.012
Primary school	4 (57.1)	3 (42.9)		
Secondary school	32 (97.0)	1 (3.0)		
Tertiary school	47 (77.0)	14 (23.0)		

There was a statistically significant relationship between age group, gender, mother's occupation, and the highest level of mother's education, respectively, and attitudes towards oral hygiene among the respondents (p=0.004, 0.026, 0.012, and 0.012, respectively).

The level of study, father's occupation and the highest education level of father had no statistically significant relationship with the attitude towards oral hygiene among the respondents (p =1.000, 0.523, and 0.0.306 respectively).

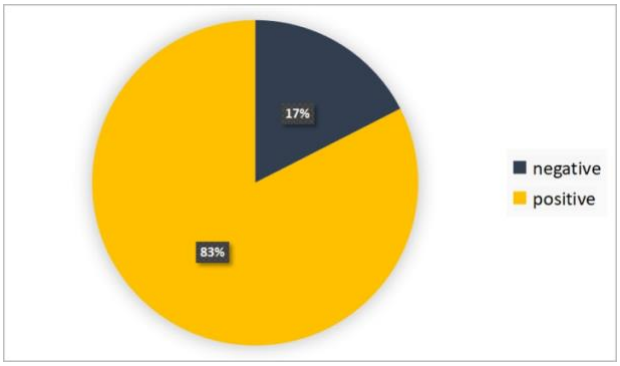

Figure 1: Attitude towards oral hygiene among respondents.

The majority, 82.5% (85) of the respondents had a positive attitude towards oral hygiene, while 18 (31.7%) respondents had a negative attitude towards oral hygiene. With a pass mark of 5 and a maximum score of 10, the mean ± SD attitude score was 5.9 ± 1.5.

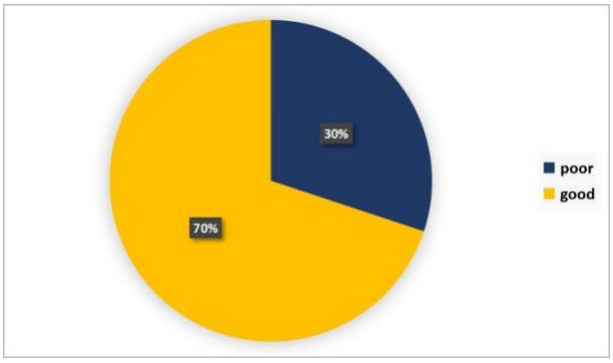

Figure 2: Practice of Oral Hygiene among respondents

A higher proportion, 69.9% (72) of the respondents had good practice of oral hygiene, while 31 (30.1%) respondents had poor practice of Oral hygiene. With a pass mark of 5 and a maximum score of 10, the mean ± SD practice score of the respondents was 5.0 ± 0.7.

Discussion

This research was conducted to evaluate the knowledge, attitudes, and practices regarding oral hygiene among nursing students at a tertiary health facility. Knowledge of oral hygiene is regarded as an important factor in the overall oral health of the patient. Patients' attitudes and oral hygiene practices are known to affect oral health-related quality of life. The current study carefully examined these factors among the nursing student population.

The sociodemographic characteristics of the respondents allowed us to understand the findings on oral hygiene-related knowledge, attitude, and practices among student nurses. The current study showed that more than half of the respondents were in the range of 18–21 years, while slightly less than that proportion (41.7%) were between 22–25 years, with a mean age of 21.39 ± 2.41 years.

This finding is in agreement with a previous study conducted by Akinyamoju et al. [14] among a similar study population. They reported that the majority of the nursing students were within a similar age range of 18–24 years. A study by [15] carried out in southern Nigeria also supports the findings in the current study. Certain studies conducted outside the country reported similar findings. For instance, Al-Shamman [16] and Peltzer and Pengpid [17] found that most health-related students were younger than 25 years. However, another study, [18] contradicted these findings, reporting a higher age range and a mean age above 26 years. The younger age reported in this study may positively influence oral hygiene practice, as younger persons are generally more receptive to health education and preventive oral health behaviors [16].

Concerning gender, our study found more female respondents than males. This may be unconnected with the fact that the nursing profession is dominated by females. Similar gender distributions have been reported by previous studies. Oladele and Folayan [19] and Udofia et al. [20] reported female-predominant gender distributions among nursing populations. Worldwide, the nursing workforce has been reported to be dominated by females compared to males [21]. However, a study conducted by [14] did not find a statistically significant association between gender and oral health-related KAP, which disagrees with our present study.

Other sociodemographic variables, such as level of study, showed a fairly even distribution across the three levels. This finding is not consistent with studies conducted by Folayan et al. [19] and Adeniyi et al. [22], which reported increased knowledge of oral health among those in higher levels. On the other hand, some researchers have reported little or no differences in oral health knowledge across levels of study, as shown by another previous study. [15]

With regard to knowledge of oral hygiene, important gaps and strengths were revealed. Regarding knowledge of plaque, 44.7% of respondents did not know what plaque is. This contrasts with findings among dental and medical students, where awareness was significantly higher (23). Nevertheless, a study [15] aligns with the present findings. Poor awareness regarding plaque accumulation after brushing was also observed, similar to the findings among university students reported by Peltzer and Pengpid [17], but contrary to findings reported by Folayan et al. [19].

Only 33.9% agreed that plaque could lead to dental caries if not removed. A previous study [22] reported a higher proportion of respondents with correct knowledge. However, 83.5% of respondents in this study knew that brushing can prevent dental caries. This finding agrees with studies by Al-Omari and Hamasha [10] and Peltzer and Pengpid [17].

Concerning attitudes toward oral hygiene, the majority (83%) demonstrated positive attitudes. This is consistent with findings by [23], who reported positive preventive attitudes among students. Similar findings were reported by [17]. Studies have shown that students in health-related disciplines often display more positive health attitudes due to curriculum exposure and professional socialization [19]. However, some studies emphasize that positive attitudes do not always translate into optimal oral hygiene practices [17].

Regarding oral hygiene practice, the majority demonstrated good practice. This is consistent with studies conducted by Peltzer and Pengpid [17] and Bashiru and Anthony [15]. The study by Al-Omari and Hamasha [23] also agrees with this report. However, gaps in practice despite positive attitudes were reported by Peltzer and Pengpid [17].

The current study also examined associations between sociodemographic variables and attitudes toward oral hygiene. A significant association was found across age groups, similar to findings by Peltzer and Pengpid [17], although this contradicts findings by Al-Omari and Hamasha [23]. Our study found a higher proportion of males with better attitudes, which contradicts reports by Al-Omari and Hamasha [23] and Peltzer and Pengpid [17], who found better attitudes among females. The finding that fathers' education and occupation were not significantly associated aligns with Peltzer and Pengpid [17]. However, the significant association with mothers' educational status supports findings by Folayan et al. [19].

Limitations of the Study

The study was limited by its cross-sectional design, which precludes causal inference. Additionally, the reliance on self-reported data may have introduced response bias, as participants could overestimate their oral hygiene practices. Future studies employing observational methods or longitudinal follow-up would provide more accurate insights.

Conclusion

Overall, the study demonstrates that while nursing students possess good knowledge and positive attitudes toward oral hygiene, gaps remain in actual practice. Bridging these gaps requires continuous oral health education and behavioural reinforcement during nursing training. Strengthening oral health promotion within the nursing curriculum can significantly enhance both professional competence and community oral health outcomes.

Funding – No funding was received for the research work, and there are no known conflicts of interest.
Data availability- Data available for sharing

References

1. Iqbal K, et al. Oral hygiene and its impact on general health. *J Oral Health*. 2021;15(2):101–108.
2. Gregory D, et al. The oral cavity as a gateway to systemic health. *Br Dent J*. 2005;198(9):563–568.
3. Sischo L, Broder HL. Oral health-related quality of life: what, why, how, and future implications. *J Dent Res*. 2011;90(11):1264–1270.
4. Park MS, et al. The role of nursing students in oral health promotion. *J Nurs Educ Pract*. 2017;7(3):45–52.
5. Ministry of Health Malaysia. *Primary Oral Healthcare: Oral Health Programme*. Putrajaya: Ministry of Health Malaysia; 2018.
6. Reddy V, et al. Knowledge, attitude and practice of oral hygiene among health science students. *J Int Oral Health*. 2014;6(1):75–80.
7. Baseer MA, et al. Oral health knowledge, attitude and practices among health professionals. *J Int Soc Prev Community Dent*. 2012;2(1):1–7.
8. Attin T, Hornecker E. Tooth brushing and oral health: how frequently and when should tooth brushing be performed? *Oral Health Prev Dent*. 2005;3(3):135–140.
9. Charters WJ. Immunizing both hard and soft mouth tissues to infection by correct stimulation with the toothbrush. *J Am Dent Assoc*. 1919;6(2):87–92.
10. Singh A, et al. Effectiveness of tongue cleaning in maintaining oral hygiene. *J Int Soc Prev Community Dent*. 2014;4(Suppl 2):S85–S88.
11. Teles RP, Teles FRF. Antimicrobial agents used in the control of periodontal biofilms. *Periodontol 2000*. 2009;55(1):68–82.
12. Lemeshow S, Hosmer DW, Klar J, Lwanga SK. *Adequacy of Sample Size in Health Studies*. Chichester: John Wiley & Sons; 1990.
13. Al-Mashhadani ZI, Hashim NA. Oral health knowledge and practices among nursing students. *J Bagh Coll Dent*. 2006;18(1):72–76.
14. Okoye LO, Ekwueme OC, Anyaehie US. Knowledge and practice of oral hygiene among health professional students in a Nigerian tertiary institution. Nig J of Dent. Res. 2020; 5(2):45–52.
15. Lawal FB, Adeleke IA. Oral health knowledge, attitude, and practices among dental auxiliaries in training in Nigeria. Afr J of Oral Health. 2019; 9(1):10–18.
16. Singh A, Purohit BM, Sequeira P. Knowledge, attitude, and practice of oral hygiene among medical and nursing students in India: A cross-sectional survey. J of Ed and Health Promotion. 2021;10(64):1–7.
17. Olusile AO, Adeniyi AA, Orebanjo O. Self-reported oral hygiene habits and dental service utilization among health care students in Nigeria. BMC Oral Health. 2018; 18(1):92–99.
18. Al-Batayneh OB, Khader Y, Owais AI. Oral health knowledge and behaviour among nursing students in Jordan: A cross-sectional study. BMC Oral Health. 2020; 20(1):27–33.
19. Akpata ES, Otoh EC, Akinwande JA. Pattern of dental visits and self-care among health professionals in Nigeria. An of Afr Med.2017; 16(3):101–108.
20. Adekoya-Sofowora CA, et al. Oral health knowledge and practices among nursing students in Nigeria. *Niger J Clin Pract*. 2006;9(2):123–126.
21. George A, Johnson M, Blinkhorn A, Ellis S. Promoting oral health among nursing students: Knowledge, attitudes, and practices. Nurse Education Today. 2021;97:104705.

22. Owusu G, Osei A, Appiah R. Oral health knowledge and behaviours among nursing students in Ghana. Ghana Med J. 2018 52(4):200–206.

23. Adegoke BO, Sofola OO. Oral hygiene practices and associated factors among university students in Lagos, Nigeria. Nig Dent J.2019; 27(1):12–19.