

# Knowledge, Attitude and Practice of Oral Hygiene among Students of Osun State University, Osogbo, Osun State

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## ABSTRACT

### Introduction

Good oral hygiene contributes significantly to overall well-being by preventing common oral diseases such as dental caries and periodontal disease. Oral diseases are major public health concerns and can affect quality of life and general health.

### Aim

This study examined knowledge, attitudes and practices regarding oral hygiene among students at Osun State University, Osogbo, Osun State.

### Methodology

A descriptive cross-sectional study was conducted using a multistage sampling technique to recruit 407 respondents. Data was collected using a pre-tested, self-administered structured questionnaire. IBM SPSS Statistics version 25 was used for univariate, bivariate and multivariate analyses. Statistical significance was set at  $p < 0.05$ .

### Results

The study revealed that 390 (95.8%) respondents had good knowledge of oral hygiene, 272 (66.8%) had a positive attitude, while 267 (65.6%) reported poor oral hygiene practices. Female respondents had higher odds of a positive attitude than males ( $OR = 1.662$ ,  $p = 0.023$ ), while respondents with a monthly income/allowance above ₦30,000 had higher odds of good practice than those with ₦30,000 or less ( $OR = 1.867$ ,  $p = 0.022$ ).

### Conclusion

The study found a high level of oral hygiene knowledge and a moderately positive attitude among respondents; however, good knowledge did not translate into good practice. Income was significantly associated with oral hygiene practice, while sex was associated with attitude. The findings highlight the need for interventions that move beyond information provision to address behavioural, financial and access-related barriers to oral hygiene.

**Keywords:** Oral hygiene; dental health; oral health behaviour; university students; knowledge; attitude;

practice.

## **BACKGROUND**

Oral health is an important component of general health and well-being. Good oral hygiene helps prevent common conditions such as dental caries and periodontal disease and supports normal eating, speaking and social functioning. Contemporary definitions of oral health emphasise physical, psychological and social dimensions rather than the absence of disease alone. Oral diseases remain a major global public health concern, and their burden is influenced by behavioural, socioeconomic and environmental factors.

Preventive oral self-care therefore remains central to oral health promotion. Regular toothbrushing with fluoride toothpaste, appropriate dietary practices, dental attendance and other preventive behaviours can contribute to better oral health. However, knowledge alone may not be sufficient to produce sustained behavioural change. Factors such as affordability of oral hygiene products, access to dental services, competing priorities, social norms and individual habits may influence whether students translate knowledge into consistent practice. The present study therefore assessed the knowledge, attitude and practice of oral hygiene among students at Osun State University, Osogbo.

## **METHODOLOGY**

### **Study Area**

Osun State University (UNIOSUN) is a multi-campus university established by the Osun State Government. The university operates six campuses located in Osogbo, Ikire, Okuku, Ifetedo, Ipetu-Ijesha and Ejigbo. The campuses accommodate programmes across health sciences, humanities and culture, social sciences and management, law, education, agriculture and related disciplines. The university provides healthcare services through its clinic, while dental services are also available at Asubiaro State Hospital and UNIOSUN Teaching Hospital, Osogbo.

### **Study Population**

The study population comprised students at Osun State University, Osogbo (UNIOSUN).

### **Study Design**

A descriptive cross-sectional design was adopted to assess knowledge, attitude and practice of oral hygiene among students at Osun State University, Osogbo. The design enabled data to be collected at a single point in time and provided a snapshot of respondents reported oral hygiene behaviours.

### **Inclusion Criteria**

Students enrolled at the selected UNIOSUN campus who were willing to participate and able to provide informed consent were eligible for the study.

### **Exclusion Criteria**

Students who were unwilling or unable to provide informed consent were excluded from the study.

### **Sample Size Determination**

The sample size was determined using Leslie Kish/Fischer's formula for estimating a single proportion in a

population greater than 10,000.

$$n = \frac{Z^2 pq}{d^2}$$

Where  $n$  = required sample size;  $Z$  = standard normal deviate (1.96);  $p$  = estimated prevalence of dental caries among university students (40.7%);  $q = 1 - p$ ; and  $d$  = precision (0.05). Using these parameters, the minimum sample size was 370. A 10% allowance for non-response was added, giving a final sample size of 407 respondents.

### Sampling Technique

A multistage sampling technique was used to recruit respondents.

Stage 1: One campus was selected from the six UNIOSUN campuses by simple random sampling using the ballot method.

Stage 2: Four faculties (Basic Medical Sciences; Basic and Applied Sciences; Engineering; and Computer, Information and Technology) were selected from the chosen campus using simple random sampling by ballot.

Stage 3: Respondents were selected from each level and department during general course lectures using simple random sampling by ballot. The number of respondents selected from each faculty and level was based on proportional allocation.

The number of students selected from each faculty and level were based on proportional allocation.

A pre-tested, semi-structured, self-administered questionnaire was used for data collection. It comprised four sections: Section A, socio-demographic characteristics; Section B, knowledge of oral hygiene; Section C, attitude towards oral hygiene; and Section D, oral hygiene practices.

The questionnaire was pre-tested among students of Obafemi Awolowo University, Ile-Ife, to assess clarity, validity and reliability and to identify items requiring restructuring.

Data were collected using self-administered, close-ended questionnaires. The researchers were available to provide clarification on the completion procedure without influencing participants' responses.

Knowledge items had a maximum obtainable score of 17. Scores of 9 or above were classified as good knowledge, while scores below 9 were classified as poor knowledge. Attitude items had a maximum obtainable score of 10; scores of 6 or above were classified as positive attitude, while lower scores were classified as negative attitude. Practice items had a maximum obtainable score of 14; scores of 8 or above were classified as good practice, while lower scores were classified as poor practice.

For attitude items, responses were scored according to the direction of the statement, with higher scores indicating a more favourable attitude. Practice responses were scored according to the predefined correct/prudent practice criteria.

Data was checked for completeness and errors before analysis. Data were analysed using Statistical Package for the Social Sciences (SPSS) version 25.0. Univariate analysis was used to summarise socio-demographic characteristics and KAP variables using frequencies and percentages. Chi-square tests were used to examine associations between categorical variables. Binary logistic regression was used to identify predictors of attitude and practice. Statistical significance was set at  $p < 0.05$  with 95% confidence intervals.

The structured questionnaire was pre-tested among students of Obafemi Awolowo University (OAU), Ile-Ife, to assess the questionnaire's validity and reliability and make necessary corrections as well as identifying questions that needed to be restructured for better understanding.

### **Methods of Data Collection**

Written informed consent was obtained from all participants before participation. Participants received information about the study objectives, voluntary participation and their right to withdraw without penalty. Confidentiality and privacy were protected through secure handling and storage of study data.

### **Measurement of Variables and Data Processing**

Ethical approval was obtained from the UNIOSUN Health Research Ethics Committee (HREC) and relevant institutional authorities before data collection. The study procedures were conducted in accordance with applicable ethical principles for research involving human participants.

Questions on attitude having options strongly agree, agree, not sure, disagree and strongly disagree responses, with a maximum obtainable score of 10. Scores greater than 50% of the maximum obtainable score (6 and above) were categorized as positive attitude while those below were categorized as negative attitude. Strongly agree and agree were scored 2 and 1 respectively if correct and same applies to strongly disagree and disagree. Questions on practice, having options yes, no and I don't know responses, with a maximum obtainable score of 14. Scores greater than 50% of the maximum obtainable score (8 and above) were categorized as good practices while those below were categorized as poor practices.

### **Data Management and Analysis**

Questionnaires were sorted and checked for errors and omissions at the end of data collection. Thereafter, data were analysed using Statistical Product and Service Solutions (SPSS) Version 25.0. Uni-variate analysis was done on the respondents' sociodemographic characteristics and presented using frequency tables, Bi-variate analysis using Chi-square test was used to examine the relationships between categorical variables. Logistic regression analysis was done to identify the predictors of the attitude and practices of the respondents. Statistical significance was set at  $p$  value  $< 0.05$  (95% confidence limits).

### **Consent/Protection of Human Subject**

Written informed consent was obtained from all participants prior to their involvement in the study to ensure voluntary participation and respect for individual autonomy. Participants were provided with clear information about the study objectives and their right to withdraw from the study at any time without penalty. Measures were implemented to safeguard participant's confidentiality and privacy including secure storage of data.

### **Ethical Considerations**

Ethical approval was sought and obtained from UNIOSUN HREC and relevant institutional review boards to ensure strict adherence to established guidelines and principles of research especially data collection and documentation of findings as participants rights were held paramount in ensuring ethical conduct of the study.

## **STUDY LIMITATIONS**

The main limitation is the restricted generalisability of the findings because the study was conducted on one campus of Osun State University. Although the multistage sampling approach improved representation within

the selected campus, the findings may not be generalisable to students in other UNIOSUN campuses, universities in Osun State or other parts of Nigeria. The cross-sectional design also prevents causal conclusions about relationships between socio-demographic characteristics and oral hygiene behaviours. In addition, the study relied on self-reported practices, which may be affected by recall and social-desirability bias. Future studies should use multicentre designs across several universities and, where feasible, combine quantitative surveys with qualitative interviews or focus group discussions to explore behavioural and environmental barriers to good oral hygiene.

## RESULTS

Table 1 below shows the socio-demographic characteristics of the respondents.

More than half of the respondents (236; 58.0%) belonged to the age group  $\geq 20$  years, with a mean (SD) of  $20 \pm 2$  years. Many of the respondents were female (239; 58.7%) and the predominant tribe among the respondents was Yoruba 379(93.1%). Regarding religion, more than half of the students were Christians (281; 69.0%). Most of the students (394; 96.8%) were single; about four-fifths of their parents had attained higher education; father (322; 79.1%) and mother (289; 71.0%). Also, majority of the parents: father (272; 66.8%) and mother; (202; 49.6%) respectively) were professionals.

**Table 1a: Socio Demographic Characteristics of the Study Respondents (n= 407)**

| Variable                                | Sub-Variable        | Frequency    | Percent |
|-----------------------------------------|---------------------|--------------|---------|
| Age (years)                             | 16-19               | 154          | 37.8    |
|                                         | $\geq 20$           | 253          | 62.2    |
| Mean (SD)                               |                     | $20 \pm (2)$ |         |
| Sex                                     | Male                | 168          | 41.3    |
|                                         | Female              | 239          | 58.7    |
| Tribe                                   | Yoruba              | 379          | 93.1    |
|                                         | Igbo                | 16           | 3.9     |
|                                         | Hausa               | 3            | 0.7     |
|                                         | Others              | 9            | 2.2     |
| Religion                                | Christianity        | 281          | 69      |
|                                         | Islam               | 125          | 30.7    |
|                                         | Traditional         | 1            | 0.2     |
| Marital status                          | Single              | 394          | 96.8    |
|                                         | Married             | 13           | 3.2     |
| Father's highest educational attainment | No formal education | 13           | 3.2     |

|                                             |                                   |     |      |
|---------------------------------------------|-----------------------------------|-----|------|
|                                             | Primary education                 | 8   | 2    |
|                                             | Secondary education               | 68  | 16.7 |
|                                             | Tertiary education                | 322 | 79.1 |
| Mother's highest educational attainment     | No formal education               | 11  | 2.7  |
|                                             | Primary education                 | 7   | 1.7  |
|                                             | Secondary education               | 100 | 24.6 |
|                                             | Tertiary education                | 289 | 71   |
| Father's occupation                         | Skilled/semi-skilled              | 132 | 32.4 |
|                                             | Unskilled                         | 3   | 0.7  |
|                                             | Professional                      | 272 | 66.8 |
| Mother's occupation                         | Skilled/semi-skilled              | 201 | 49.4 |
|                                             | Unskilled                         | 4   | 1    |
|                                             | Professional                      | 202 | 49.6 |
| Who do you live with (at home)?             | With single parent                | 68  | 16.7 |
|                                             | With both parents                 | 283 | 69.5 |
|                                             | Others                            | 56  | 13.8 |
| Average monthly income/allowance (in naira) | ≤ 30,000                          | 326 | 80.1 |
|                                             | > 30,000                          | 81  | 19.9 |
| College                                     | SET                               | 151 | 37.1 |
|                                             | CHS                               | 256 | 62.9 |
| Faculty                                     | Faculty of Basic Medical Sciences | 250 | 61.4 |

SET- Science, Engineering and Technology

CHS- College of Health Sciences

Table 2 shows the respondents' knowledge of oral hygiene. Among respondents, 245 (60.2%) reported using a medium-bristle toothbrush and 157 (38.6%) reported using a soft-bristle toothbrush, while 5 (1.2%) reported using a hard-bristle toothbrush. All respondents (407; 100.0%) had heard of oral hygiene and had sought information about it. The internet was the most reported source of information (260; 63.9%), followed by hospitals/health workers (82; 20.1%). Most respondents knew that oral health is closely related to general health (389; 95.6%), that diseases can show signs in the mouth (363; 89.2%), that poor oral hygiene can lead to dental caries and periodontitis (366; 89.9%), and that proper oral hygiene can prevent dental caries and periodontitis (362; 88.9%).

**Table 2a: Knowledge of Respondents on Oral Hygiene. (n=407)**

| Variable                                                          | Sub-variable              | Frequency | Percent |
|-------------------------------------------------------------------|---------------------------|-----------|---------|
| Teeth should be cleaned using                                     | Soft-bristle toothbrush   | 157       | 38.6    |
|                                                                   | Medium-bristle toothbrush | 245       | 60.2    |
|                                                                   | Hard-bristle toothbrush   | 5         | 1.2     |
| Ever heard of oral hygiene?                                       | Yes                       | 407       | 100     |
|                                                                   | No                        | 0         | 0       |
| Have you ever sought information on oral hygiene?                 | Yes                       | 407       | 100     |
|                                                                   | No                        | 0         | 0       |
| Your source of information on oral hygiene                        | Radio                     | 18        | 4.4     |
|                                                                   | Tv                        | 40        | 9.8     |
|                                                                   | Internet                  | 260       | 63.9    |
|                                                                   | Hospital/health worker    | 82        | 20.1    |
|                                                                   | Newspaper                 | 2         | 0.5     |
|                                                                   | School                    | 5         | 1.2     |
| Oral health is closely related to an individual's general health. | Yes                       | 389       | 95.6    |
|                                                                   | No                        | 6         | 1.5     |
|                                                                   | Don't know                | 12        | 2.9     |
| Certain diseases of the human body can show signs in the mouth    | Yes                       | 363       | 89.2    |
|                                                                   | No                        | 14        | 3.4     |
|                                                                   | Don't know                | 30        | 7.4     |

**Table 2b: Knowledge of Respondents on Oral Hygiene. (n=407)**

| Variable                                                          | Yes (%) | No (%) | Don't know (%) |
|-------------------------------------------------------------------|---------|--------|----------------|
| Oral health is closely related to an individual's quality of life | 343     | 32     | 32             |

|                                                                                                              |               |               |               |
|--------------------------------------------------------------------------------------------------------------|---------------|---------------|---------------|
|                                                                                                              | (84.3)        | (7.9)         | (7.9)         |
| Poor oral hygiene can lead to dental caries and periodontitis (akokoro)                                      | 366<br>(89.9) | 16<br>(3.9)   | 25<br>(6.1)   |
| Smoking is linked with the occurrence of oral cancer and periodontitis.                                      | 325<br>(79.9) | 21<br>(5.2)   | 61<br>(15.0)  |
| Diet type can contribute to the development of dental caries                                                 | 324<br>(79.6) | 33<br>(8.1)   | 50<br>(12.3)  |
| The care of milk (children's) teeth are just as important as of adult's teeth                                | 356<br>(87.5) | 17<br>(4.2)   | 34<br>(8.4)   |
| Proper oral hygiene can prevent dental caries and periodontitis                                              | 362<br>(88.9) | 13<br>(3.2)   | 32<br>(7.9)   |
| Fluorides can protect teeth against decay (akokoro)                                                          | 297<br>(73.0) | 22<br>(5.4)   | 88<br>(21.6)  |
| Regularly consuming sugary drinks may cause tooth decay                                                      | 332<br>(81.6) | 34<br>(8.4)   | 41<br>(10.1)  |
| Teeth brushing should be done for 2mins and at least twice per day                                           | 341<br>(83.8) | 27<br>(6.6)   | 39<br>(9.6)   |
| It is normal for my gum to bleeds when I brush                                                               | 92<br>(22.6)  | 243<br>(59.7) | 72<br>(17.7)  |
| Teeth brushing should be done preferably before a meal in the morning and before going to bed in the evening | 356<br>(87.5) | 22<br>(5.4)   | 29<br>(7.1)   |
| Dental flossing should be done at least once daily                                                           | 266<br>(65.4) | 38<br>(9.3)   | 103<br>(25.3) |

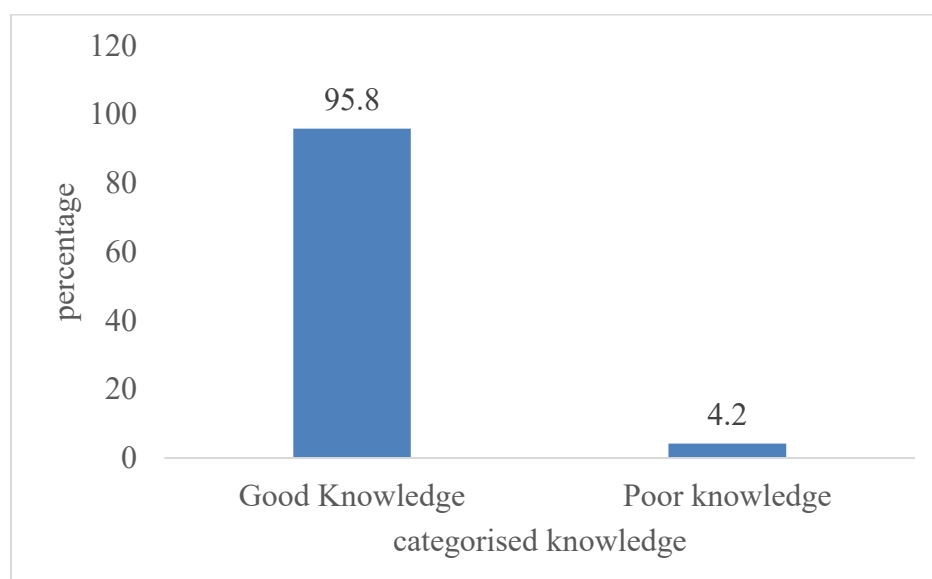


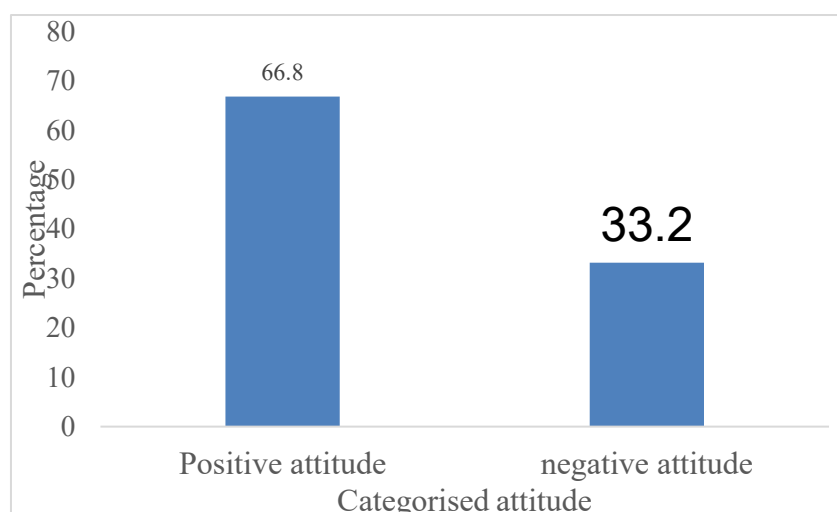
Fig 4.1: Respondent's categorized knowledge of oral hygiene

Figure 4.1 shows that most of the respondents (390; 95.8%) had good knowledge while only (17;4.2%) had poor knowledge.

Table 3 below shows that most of the respondents (371; 91.1%) agreed that everyone should visit a dentist at least once a year, 299 ( 83.5%) agreed that tobacco chewing is not a healthy habit, 351 (86.2%) agreed that smoking in any form is a bad habit, while 194 (47.7%) disagreed that teeth could be well cleaned without using toothpaste and 346 (85.0%) agreed that hardness of bristles of toothbrush may have effect on teeth and gum.

**Table 3: Attitude of respondents towards oral hygiene. (n=407)**

| Variable                                                                | Strongly agree (%) | Agree (%)  | Neutral (%) | Disagree (%) | Strongly disagree (%) |
|-------------------------------------------------------------------------|--------------------|------------|-------------|--------------|-----------------------|
| Everyone should visit a dentist at least once a year                    | 228 (56.0)         | 143 (35.1) | 28 (6.9)    | 6 (1.5)      | 2 (0.5)               |
| Chewing tobacco is not a healthy habit                                  | 197 (48.4)         | 102 (25.1) | 74 (18.2)   | 16 (3.9)     | 18 (4.4)              |
| Smoking in any form is a bad habit.                                     | 272 (66.8)         | 79 (19.4)  | 34 (8.4)    | 13 (3.2)     | 9 (2.2)               |
| Teeth can be well cleaned without using toothpaste                      | 42 (10.3)          | 76 (18.7)  | 95 (23.3)   | 101 (24.8)   | 93 (22.9)             |
| Hardness of bristles of toothbrushes may have effect on teeth and gums. | 215 (52.8)         | 131 (32.2) | 44 (10.8)   | 7 (1.7)      | 10 (2.5)              |



**Fig 4.2: Respondents' attitude toward oral hygiene**

This figure shows that majority (272; 66.8%) of the respondents had positive attitude towards oral hygiene while 135 (33.2%) had a negative attitude.

Table 4 below shows that nearly half of the respondents (201; 49.4 %) cleaned their teeth once daily, a similar proportion cleaned theirs twice daily 196 (48.2%). Two (2; 0.5%) respondents cleaned their teeth once weekly, and 7 (1.7%) never cleaned their teeth at all. Most of the respondents (359; 88.2%) cleaned their teeth with toothbrush and toothpaste while others (48; 11.8%) used other teeth cleaning methods. About two-thirds of the respondents (268; 65.8%) cleaned their teeth for two-three minutes during a tooth-cleaning episode, more than half of the respondents used a medium toothbrush (210; 51.6%) while the majority change their toothbrush every 3 months (259; 63.6%). Most (223; 54.8%) used combination teeth cleaning technique, (205; 50.4%) brushed their tongue every time they brushed and (223; 54.8%) rarely use dental floss.

**Table 4a: Respondents' oral hygiene practice (n=407)**

| Variable                                                    | Sub-variable                  | Frequency | Percent |
|-------------------------------------------------------------|-------------------------------|-----------|---------|
| How frequently you clean your teeth?                        | Never                         | 7         | 1.7     |
|                                                             | Once daily                    | 201       | 49.4    |
|                                                             | Twice daily                   | 196       | 48.2    |
|                                                             | Once weekly                   | 2         | 0.5     |
|                                                             | Thrice or more daily          | 1         | 0.2     |
| What do you use to clean your teeth?                        | Chewing stick only            | 12        | 2.9     |
|                                                             | Toothbrush only               | 25        | 6.1     |
|                                                             | Toothbrush and toothpaste     | 359       | 88.2    |
|                                                             | Chewing sticks and toothpaste | 7         | 1.7     |
|                                                             | Toothpaste only               | 3         | 0.7     |
|                                                             | Toothbrush and table salt     | 1         | 0.2     |
| How long do you brush/clean your teeth?                     | Less than a minute            | 42        | 10.3    |
|                                                             | Two to three minutes          | 268       | 65.8    |
|                                                             | ≥ Four minutes                | 97        | 23.8    |
| What type of toothbrush do you use? (toothbrush users only) | Very soft (extra-soft)        | 36        | 8.8     |
|                                                             | Soft                          | 104       | 25.6    |
|                                                             | Medium                        | 210       | 51.6    |

|                                                                     |                 |     |      |
|---------------------------------------------------------------------|-----------------|-----|------|
|                                                                     | Hard            | 48  | 11.8 |
|                                                                     | I don't know    | 9   | 2.2  |
| How often do you change your toothbrush?<br>(toothbrush users only) | Once            | 41  | 10.1 |
|                                                                     | Every 3 months  | 259 | 63.6 |
|                                                                     | Every 6 months  | 83  | 20.4 |
|                                                                     | Every 12 months | 18  | 4.4  |
|                                                                     | I don't know    | 6   | 1.5  |

**Table 4b: Respondents' oral health practices (n=407)**

| Variable                                          | Sub-variable                      | Frequency | Percent |
|---------------------------------------------------|-----------------------------------|-----------|---------|
| What teeth cleaning technique do you usually use? | Horizontal (side to side only)    | 55        | 13.5    |
|                                                   | Vertical (up and down only)       | 86        | 21.1    |
|                                                   | Circular                          | 43        | 10.6    |
|                                                   | Combination                       | 223       | 54.8    |
| How often do you brush your tongue?               | Never                             | 15        | 3.7     |
|                                                   | Rarely                            | 35        | 8.6     |
|                                                   | Daily                             | 152       | 37.3    |
|                                                   | Every time I brush my teeth       | 205       | 50.4    |
| How often do you use dental floss?                | Never                             | 98        | 24.1    |
|                                                   | Rarely                            | 223       | 54.8    |
|                                                   | Daily                             | 86        | 21.1    |
| Have you ever visited a dentist?                  | Yes                               | 130       | 31.9    |
|                                                   | No                                | 277       | 68.1    |
| Your reason for the visit? (n = 130)              | Problem with tooth                | 57        | 43.8    |
|                                                   | Continuation of regular treatment | 16        | 12.3    |
|                                                   | Regular check-ups                 | 57        | 43.8    |

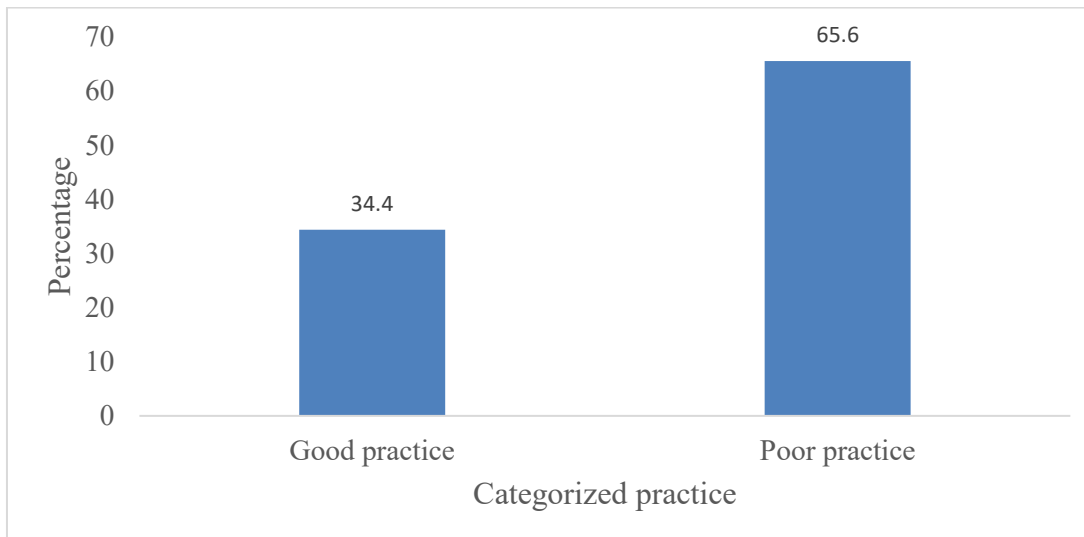


Fig 4.3: Respondents oral hygiene practices.

Figure 4.3 shows that the percentage of respondents with good practice is quite less than the percentage of respondents with poor practice as only 140 (34.4%) respondents had good practice while 267 (65.6%) had poor practice.

Table 5 below shows the binary logistic regression analysis of the effect of the respondent's socio-demographic characteristics on the outcome variable (practice of oral hygiene). Respondents that earn more than #30,000 monthly are about two times more likely to have good practice than those that earn below that. (OR= 1.867, p-value= 0.022)

**Table 5: Binary Logistic Regression analysis of the effect of the Respondent's Socio-Demographic Characteristics on the Outcome Variable (Practice of Oral Hygiene). (n=407)**

| Variable                                         | Sub variable       | Odd ratio | P value      | 95% Confidence Interval |       |
|--------------------------------------------------|--------------------|-----------|--------------|-------------------------|-------|
|                                                  |                    |           |              | Lower                   | Upper |
| Who do you live with (at home)?                  | With both parents  | 1(ref)    | 0.596        |                         |       |
|                                                  | With single parent | 0.977     | 0.939        | 0.542                   | 1.761 |
|                                                  | Others             | 0.708     | 0.31         | 0.364                   | 1.379 |
| Your average monthly income/allowance (in naira) | ≤ 30,000           | 1(ref)    |              |                         |       |
|                                                  | > 30,000           | 1.867     | <b>0.022</b> | 1.092                   | 3.193 |

## DISCUSSION

In this study, 390 (95.8%) respondents demonstrated good knowledge of oral hygiene. This high level of knowledge suggests that the respondents were generally aware of the importance of oral health and the consequences of poor oral hygiene. The finding is consistent with the broader evidence that oral health knowledge can be relatively high among student populations, although the extent to which knowledge translates into behaviour varies across settings. A systematic review and meta-analysis by Jiang et al. (2025), for example, examined oral health-related knowledge, attitudes and behaviours among dental students and highlighted the importance of considering behavioural outcomes alongside knowledge.

The specific knowledge findings were also encouraging. Most respondents recognised the relationship between oral health and general health, the contribution of diet to dental caries, the association between smoking and oral disease, and the importance of regular toothbrushing. These findings indicate that information about oral hygiene was available to the study population. However, the high knowledge score should be interpreted alongside the practice findings, because knowledge did not necessarily result in consistent preventive behaviour.

Regarding attitude, 272 (66.8%) respondents had a positive attitude towards oral hygiene, while 135 (33.2%) had a negative attitude. Most respondents agreed that dental visits were important and recognised the harmful effects of tobacco and smoking. Female respondents had a higher proportion of positive attitude than males. This finding indicates that attitudes may differ by sex, although the cross-sectional design does not permit a causal explanation for the observed association.

The sex difference in attitude may reflect differences in health-related priorities, social expectations or willingness to engage with preventive health behaviours; however, these explanations were not directly measured in the present study and should therefore be interpreted cautiously. The important finding is that a positive attitude was present in about two-thirds of respondents, yet this did not correspond to a similarly high level of good practice.

The most important finding was the knowledge-practice gap. Although 95.8% of respondents had good knowledge and 66.8% had a positive attitude, only 140 (34.4%) demonstrated good oral hygiene practice,

while 267 (65.6%) had poor practice. This suggests that awareness alone may be insufficient to produce sustained oral health behaviour. In this study, almost half of respondents brushed once daily (201; 49.4%), fewer than half brushed twice daily (196; 48.2%), and 68.1% had never visited a dentist. Dental flossing was also uncommon, with 54.8% reporting that they rarely used dental floss and 24.1% reporting never using it. These findings point to a gap between what students know and what they routinely do.

Several behavioural and environmental factors may help explain this gap. Financial constraints may affect the ability to purchase appropriate oral hygiene products or seek professional dental care. Access to convenient and affordable dental services may also influence preventive attendance. In addition, established habits, competing academic demands, perceived susceptibility to oral disease, family and peer influences, and cultural norms may affect the consistency of oral hygiene behaviours. The significant association between monthly income/allowance and practice supports the importance of socioeconomic circumstances: respondents earning more than ₦30,000 were more likely to have good practice than those earning ₦30,000 or less (OR = 1.867,  $p = 0.022$ ). Rather than interpreting this finding as proof that income causes poor practice, it should be understood as an association that warrants further investigation. Qualitative interviews or focus group discussions could help identify the specific financial, access-related, behavioural and cultural barriers experienced by students. Evidence from school-based oral health interventions in Nigeria also suggests that education can improve oral hygiene behaviours, supporting the need for interventions that combine information with practical behavioural support (Chukwuemeka et al., 2025).

## CONCLUSION

The study found that students at Osun State University, Osogbo, had a high level of knowledge of oral hygiene and a moderately positive attitude, but good knowledge and attitude did not translate into good practice. Only 34.4% of respondents had good oral hygiene practice, indicating a substantial knowledge-practice gap. Monthly income/allowance was significantly associated with practice, while sex was associated with attitude.

The findings suggest that oral health promotion among university students should extend beyond knowledge provision to address behavioural, socioeconomic and access-related barriers. Multicomponent interventions involving health education, practical skills, improved access to preventive dental services and supportive university policies may help translate knowledge into sustained oral hygiene practices.

## RECOMMENDATIONS

### To the Government

Government: Support oral health promotion programmes in universities and strengthen access to affordable preventive dental services for young adults.

### To the University

University: Integrate practical oral health education into student health programmes, provide accessible information on effective oral hygiene practices, and explore partnerships with dental services for routine screening and referral.

### To Healthcare workers

Healthcare workers: Provide regular oral health education and counselling that focuses on practical skills, preventive dental attendance and the barriers that may prevent students from adopting recommended behaviours.

Healthcare workers should also provide clear guidance on appropriate oral hygiene materials and techniques.

### To Individuals

Individuals: Adopt consistent oral hygiene behaviours, including appropriate tooth brushing and other recommended preventive practices, and seek professional dental care when required.

Students should also make use of available dental services for preventive check-ups rather than waiting until oral problems become severe.

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