

**RELATIONSHIP BETWEEN
SELF-PERCEIVED ORAL HEALTH PROBLEMS
AND ORAL CARE PRACTICES
AMONG SECONDARY SCHOOL STUDENTS IN IBADAN**

BY

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**DISSERTATION SUBMITTED TO THE FACULTY OF DENTISTRY IN PARTIAL
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ABSTRACT

Some methods of oral care adopted by individuals may be the cause of their self-perceived oral health problems.

This cross-sectional survey was done to determine the effect of oral care practices on self-perceived oral health problems among secondary school students in Ibadan. Permission to conduct the study was gotten from the commissioner for Education and the school authorities. Consent was also obtained from the parents and students who are 18 years and above; and assent was gotten from students less than 18 years of age. A 14-item structured questionnaire seeking information on self-perceived oral health problems and oral care practices was filled by each participant under supervision. The data was analyzed using windows statistical package for social sciences (SPSS), version 21.0. Descriptive statistics was performed on the variables and their associated factors. Significant association between variables was tested using chi-square and the results were presented in tables and charts.

Out of 250 questionnaires administered, only 246 provided adequate information for analysis. The age range of the respondents was between 12 and 23 years, with 67.5% being within 15-17 years. The males were 102 (41.5%), and there were 144 females (58.5%). Some of the respondents (45.5%) reported experience of one oral health problem or the other in the past one year, and 91.9% of the respondents were of opinion that their oral health can be improved. Statistically significant relationship was found between self-perceived pain in the gum and technique of brushing employed ($\chi^2 = 12.039$, $p = 0.002$). Similarly, there was statistically significant relationship between gender and tool used for tooth cleaning ($\chi^2 = 6.790$, $p = 0.034$). The relationship between age group and the frequency of tooth cleaning ($\chi^2 = 21.661$, $p = 0.001$) was also significant.

Key words: self-perceived oral health problems, practices.

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DEDICATION

This project is dedicated to my compassionate husband and sponsor, Major Christian C. Okechukwu. You sacrificed so much to see me complete this work. You have raised me up to more than I could be. You are Our Father's personal gift to me.

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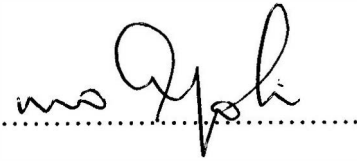
My present and past sub-deans postgraduate, faculty of dentistry, lecturers and teachers including: Dr. I.M. Abiodun-Solanke, Dr. O. Ibiyemi, Dr. A.T. Adeyemi, Dr. V.I. Akinmoladun, Dr. V.N. Okoje-Adesomoju, Prof. J.T. Arotiba, Prof. O.O. Dosumu, Prof. O.O. Denloye. Dr. O.O. Bankole and Dr. D.M. Ajayi, God reward you all abundantly.

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Above all, I thank You, my Almighty Daddy God, You continue to grace and protect us all, despite our shortcomings.

CERTIFICATION

We certify that the project titled “**Relationship Between Self-Perceived Oral Health Problems and Oral Care Practices Among Secondary School Students in Ibadan**” was carried out by Dr. Ikeobi Ada Esther at the faculty of dentistry, University of Ibadan.



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TABLE OF CONTENTS

Pages

TITLE PAGE	i
ABSTRACT	ii
DEDICATION	iii
ACKNOWLEDGEMENT	iv
CERTIFICATION	v
TABLE OF CONTENTS	vi
LIST OF TABLES	viii
LIST OF FIGURES	ix
CHAPTER ONE: INTRODUCTION	1
1.1 Background	1
1.2 Problem Statement	3
1.3 Rationale for The Study.....	3
CHAPTER TWO: LITERATURE REVIEW	4
2.1 Self-perceived Oral Health Problems	4
2.2 Impacts of Self Perceived Oral Health Status.....	4
2.3 Factors that Influence Perception of Oral Health.....	5
2.4 Oral Care Practices:	5
2.5 Factors that Influence Oral Care Practices.....	6
CHAPTER THREE: AIM AND OBJECTIVES	8
3.1 Aim.....	8
3.2 Objectives.....	8
3.3 Working Hypothesis	8
3.4 Research Question	9
CHAPTER FOUR: METHODOLOGY	10
4.1 Study Design and Scope.....	10
4.2 Study Location.....	10
4.3 Study Population.....	10
4.4 Sample Size.....	10
4.4.1 Sampling Technique.....	11
4.5 Eligibility Criteria.....	11

vi

4.5.1	Inclusion Criteria.....	11
4.5.2	Exclusion Criteria.....	11
4.6	Ethical matters.....	11
4.7	Data Collection.....	11
4.7.1	Reliability.....	11
4.7.2	Validity	12
4.8	Data Management.....	12
CHAPTER FIVE: RESULTS.....		13
5.1	Demography of the Respondents.....	13
5.2	Distribution of the Respondents according to the Self-Perceived Oral Health Problems Among the Age Groups and Genders.....	13
5.3.	Respondents' Personal opinion on whether oral health can be improved.....	18
5.4	Distribution of the Respondents according to the Oral Care Practices Among the Age Groups and the Genders.....	19
5.5	Relationship Between the Self-Perceived Oral Health Problems and the Oral Health Practices.	25
CHAPTER SIX: DISCUSSION.....		33
6.1	Discussion.....	33
6.2	Conclusion.....	38
6.3	Limitation of the Study.....	38
6.4	Recommendations.....	38
REFERENCES.....		39
APPENDICES		46
Appendix 1:	Copy of the Questionnaire.....	46
Appendix 2:	Copy of the Informed Consent Form.....	48
Appendix 3:	Copy of the Parental Informed Consent Form (English)	51
Appendix 4:	Copy of the Parental Informed Consent Form (Yoruba translation)	54
Appendix 5:	Copy of the Letter of Assent.....	57
Appendix 6:	Copy of Ethical Approval	58
Appendix 7:	Copy of Permission from Ministry of Education.....	59

LIST OF TABLES

Pages

Table 1: Frequency distribution of Self-perceived experience of oral health Problems.....	15
Table 2: Comparison of the self-perceived oral health problems of the respondents with their age groups.....	17
Table 3: Comparison of the self-perceived oral health problems of the respondents with their gender	18
Table 4: Frequency distribution of oral Care practices by respondents.....	21
Table 5: Comparison of the oral health practices of respondents with their age groups.....	23
Table 6: Comparison of the oral health practices of respondents with their gender	24
Table 7: Comparison of self-perceived oral health problems of respondents with selected oral health practices.....	27
Table 8: Comparison of self-perceived pain in the gum among respondents with selected oral health practices.....	28
Table 9: Comparison of self-perceived toothache among respondents with selected oral health practices.....	29
Table 10: Comparison of self-perceived tooth mobility among respondents with selected oral health practices.....	30
Table 11: Comparison of self-perceived bleeding from the gum among respondents with selected oral health practices.....	31
Table 12: Comparison of self-perceived swelling of the gum among respondents with selected oral health practices.....	32

LIST OF FIGURES

Pages

Figure1: Bar chart showing the percentage distribution of the age groups of the respondents.....	14
Figure 2: Pie chart showing the gender distribution of the respondents.	14
Figure 3: Pie chart showing Self-perceived experience of oral health problem.	15
Figure 4: Pie chart showing the personal opinion of the respondents on whether their oral health can be improved.....	19

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CHAPTER ONE

1.0 INTRODUCTION

1.1 Background to the study

Oral health refers to a condition of the mouth and its related tissues which enables an individual to eat, speak and socialize without disease, discomfort or embarrassment, and contributes to general well-being (The World Oral Health Report, 2003). Self-perceived oral health refers to an individual's subjective measure of his or her oral health condition (Atchison & Gift, 1997). Studies have shown that poor oral health in both children and adults impacts their eating, sleeping, physical activities, emotional stability, self-expression, and subsequently their social interactions (Patel RR et al, 2007; Patel RR et al, 2008; Adulyanon et al; 1996).

Apart from these, the self-perceived oral health problems may be caused or influenced by the methods of oral care adopted by individuals. It will be useful to find out if the commonly adopted oral care practices relate to the presence of certain oral health challenges. This is particularly important considering such findings that many people, when they perceive that they have oral problems like pain, cavities, aesthetic issues and difficulty in chewing, tend to get to a distressing state, before they seek professional care (Tanwir et al, 2006). Also it is possible that some may resort to non-professional means of solving their oral health challenges, which could worsen the problem.

The study of Pinelli et al. in 2007 showed that self-perceived oral health was found a substantially reliable indicator for oral condition. Its validity was good at detecting dental conditions and temporomandibular joint disorders, though more sensitive than specific to detect the presence of periodontal disease. An almost perfect agreement was found for self-perceived temporomandibular joint and periodontal conditions. The findings of Atchison et al. (1997) also suggest that perceived oral health can be a useful outcome measure in dentistry because of its relation to predisposing sociodemographics and dental utilization.

One of the goals of the World Health Organisation is to ensure increased uptake of preventive oral care by 2020 (World Health Organization, 2013). Oral care practice refers to methods of keeping the mouth and its related structures healthy and clean (American Dental Association 2012). The essence of such efforts is to prevent and to treat associated oral diseases such as gingivitis, periodontitis, halitosis, and dental caries. Also recent studies have associated poor oral care with systemic conditions like cardiovascular disease and pre-term low birth weight infant (Li X et al, 2000).

Before the modern toothbrush was invented, selected sticks were chewed and used to clean the teeth and tongue, and in many developing countries, such traditional practice have persisted (Wu CD et al, 2001). The World Health Organisation and other institutions have recognized and encouraged the use of these traditional devices, owing to the evidences that they help in promoting oral health (WHO Oral health country/area profile programme 2013). Healthy oral self-care habits of significant importance include cleaning the mouth twice daily (Marinho et al, 2003; Twetman et al, 2003; Bratthall et al, 1998), use of medium textured toothbrushes and Fluoride toothpastes (Adair, 2006; Davies, 2003), using interdental cleaning devices, such as dental floss and interdental brushes (Gjerme, 1970), and restriction in consumption of refined carbohydrate in-between meals (Kidd & Fejerskov, 2013; Tseveenjav et al 2004). A combination of these approaches is important for successful self-dependent interventions (Khami et al, 2007). In addition, it is important to supplement such self-care with regular dental check-ups (American Dental Association 2012).

In Nigeria, young persons and adolescents constitute 55% and 23% of the population respectively; and about thirty million children (62.1% and 44.1% of eligible primary and secondary school students) are in schools (Nigeria Education Fact Sheet, 2013; Nigeria: School Enrolment, 2013).

A secondary school is a school that is intermediate in level between elementary school and college. It usually offers general, technical, vocational and/or college-preparatory classes (Secondary school: Wikipedia). These students, mostly adolescents, are usually under the care of parents/carers who support them financially and otherwise. They also spend considerable time in school, making it an important environment for the development of healthy behaviours (Pomarico L, de Souza IP, Tura LF. 2003). When school oral health

programmes are developed with the above facts in mind, they are effective in improving the oral health awareness and behavior, as well as oral health status of these young people (Yazdani et al, 2009. Tai et al, 2009. World Health Organization).

1.2 Problem Statement

To the best of my knowledge, and from my literature search, no study on self-perceived oral health problems among secondary school students in Ibadan, has been done, neither has any related self-perceived oral health problems to the oral care practices employed by them. This study is intended to provide information on this possible relationship.

1.5 Rationale/ Justification for the Study

This study was done to provide a picture of the relationship between self-perceived oral health problems and the oral care practices employed by this population. This information indicates in what ways intervention can be made by the responsible authorities to protect and improve their health.

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CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Self-Perceived Oral Health Problems:

Among dental auxiliary students, Azodo et al. found that more than half of them perceived their oral health as good. Also, they found that the perception of oral health status and treatment need was the same between the two Nigerian schools they studied. Among internal medicine residents in Nigeria, 57.8% strongly agreed/agreed that the state of their oral health was excellent (Iwuala et al, 2010). Olusile et al. found that about 21.2% of their participants, among adult Nigerians, perceived their oral health status as very good, 37.1% as good and 27.4% as fair. However, a significant, negative, correlation was found between satisfaction with personal dental appearance and awareness of malocclusion among Nigerian adolescents (Onyeaso & Sanu, 2005).

Similarly, a study in Sweden (Ostberg et al, 2002) showed that most of their adolescents perceived their oral health as good. Chinese adolescents studied by Jiang et al. (2005) generally gave the self-assessment of their dental health as good. However, 12% of the students answered that their dental health was “poor” or “very poor”, with 9% claiming they had “poor” or “very poor” gums, and 41% of them reported that they had experienced toothache or other symptoms during the previous 12 months. Also, from Tanzania, Mashoto et al. (2009) reported that substantial proportions of students reported to have experienced oral problems, especially dental pain from untreated dental caries which had impacts on eating and teeth cleaning.

2.2 Impacts of Self-Perceived Oral Health Status

Sam et al. (2006) demonstrated that periodontal disease had significant impacts on oral health-related quality of life such as functional limitation, physical pain, and psychological discomfort. Eleven percent of the Chinese adolescents studied by Jiang et al.

(2005) mentioned that other students made fun of their teeth, and 24% of the respondents were dissatisfied with the appearance of their teeth.

2.3 Factors that Influence Perception of Oral Health

According to Atchison et al. (1997); the most important significant predictors of perceived oral health include having oral pain, perceived general health status, education and ethnic group. Azodo et al. (2012) reported gender influence in the oral health perception and practices among medical house officers in Benin city, Nigeria. Their report agrees with those of Ostberg et al, 1999, in which girls considered sound teeth to be more important than did boys, and girls also perceived their own oral health to be good to a higher degree than did boys. In another study on gender perspective of self-perceived oral health in adolescents, girls, more than boys, reported less self-assessed gingival bleeding, but were less satisfied with the appearance of their teeth (Ostberg et al, 2001).

In a related study, adolescents living with a single mother, or with neither parent, were found less likely to perceive their oral health as good (Ostberg et al, 2003). They gave more reports of gingival bleeding than those who lived with both parents. Locker (2009) found that psychosocial factors partly explain the socioeconomic disparities in self-perceived oral health: socioeconomic status influences the psychosocial behaviors of the individual with respect to how they perceive their oral health. And among the Chinese adolescents studied by Jiang et al. (2005), the perceived dental health status and needs of the participants were associated with gender, age, lifestyles, school performance, and socio-economic status.

2.4 Oral Care Practices:

Lawal et al. (2013) reported that among their participants, 50.3% used toothbrush solely to clean their teeth, 18.5% used chewing sticks alone while 30.5% used both tooth brush and chewing stick. Nearly all of the participants knew that oral health services are available in most hospitals, yet only few had ever visited a Dental Centre. But according to Ogunrinde et al, 2015, among secondary school adolescents in Ibadan, majority of the respondents have poor dental health practice, and many used toothpicks to remove food trapped in between teeth. Also, only few respondents had visited dentists before.

In Ibadan North Local Government Area, adolescents displayed significantly high positive attitude and sound practices towards dental health (Ogundele & Ogunsile, 2008):

majority of them reported that they clean their mouth twice daily, but only 4.1% of them had used dental floss at least once before, and only 6.7% knew that dental floss is an interdental cleaning device (Adeyemi et al, 2012). About 22 % were of the opinion that dental checkup is not necessary or that it is burdensome. In southern Nigeria, another study found that the use of combination approaches for oral self-care was very low among school pupils (Folayan et al. 2014).

From Iran, it was recorded that oral hygiene habits among school children was not satisfactory (Kamran et al, 2014). The participants had poor oral health behavior, with insufficient knowledge, incorrect attitude and practice regarding oral health. Also, only 8.2% had the habit of rinsing their mouth after eating. Conversely, among Chinese adolescents, positive attitude towards dental care was found in all age groups; 67% of them brushed their teeth at least twice a day and 48% of the them used fluoridated toothpaste. However, only 26% of the students visited a dentist during the previous 12 months (Jiang et al, 2005).

2.5 Factors that Influence Oral Care Practices

According to Ogunrinde et al. (2015); there was a statistically significant relationship between tooth brushing technique and type of school attended by respondents among secondary school adolescents in Ibadan. Age and sex were predictive factors for the use of the components of the oral self-care measures, as found by Folayan et al. (2014), Lawal et al. (2013), reported that socioeconomic considerations highly influenced the oral health practice of a typical traditional community in Nigeria. Those with no formal education, those in lower occupational classes and the older residents of the community were more likely to use chewing stick. Frequency of oral hygiene effort was also significantly related to educational level attained and occupational class.

Among adult Nigerians, Olusile et al (2014) found that more educated, female and younger persons used toothbrushes for daily tooth cleaning. They noted that age, sex, marital status, level of education and occupation were significantly related to daily frequency of tooth cleaning. Another study reported that females, in comparison to males significantly gave good attention to their oral health, used medium strength toothbrush,

brushed teeth more than once-daily, visited dentist and chose toothpaste following dentist recommendations (Azodo & Unamatokpa, 2012).

From the USA, female gender, education, certain oral health beliefs, household income, and the presence of a usual source of care showed a significant positive relationship with better personal oral hygiene practices across several ethnic and age groups (Davidson et al, 1997). In Sweden, adolescents perceived the possibilities of influencing their own oral health as limited. Perceptions of such influences were related to personal and professional care, social support, social impact, time and economy (Ostberg et al, 2002).

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CHAPTER THREE

3.0 AIM AND OBJECTIVES

3.1 The Aim

To determine the effect of oral care practices on self-perceived oral health problems among secondary school students in Ibadan.

3.2 Objectives

1. To assess oral health problems perceived by secondary school students in Ibadan in the past one year.
2. To assess the oral care measures practiced by secondary school students in Ibadan.
3. To determine the relationship between the self-perceived oral health problems and the oral care practices employed by secondary school students in Ibadan.
4. To determine whether such relationship is related to the age of the students.
5. Also to determine whether such relationship is related to the gender of the students.

3.3 Working hypothesis

1. There is no association between the self-perceived oral health problems and the oral care practices employed by secondary school students in Ibadan.
2. There is an association between the self-perceived oral health problems and the oral care practices employed by secondary school students in Ibadan.
3. Any association between the self-perceived oral health problems and the oral care practices employed by secondary school students in Ibadan is related to the age of the students.
4. Any association between the self-perceived oral health problems and the oral care practices employed by secondary school students in Ibadan is not related to the age of the students.

Any association between the self-perceived oral health problems and the oral care practices employed by secondary school students in Ibadan is related to the gender of the students.

Any association between the self-perceived oral health problems and the oral care practices employed by secondary school students in Ibadan is not related to the gender of the students.

4 Research Questions

The research questions formulated to guide this study were as follows:

Do secondary school students in Ibadan have any self-perceived oral health problems?

What are the self-perceived oral health problems experienced among secondary school students in Ibadan in the past one year?

What oral care measures are practiced by secondary school students in Ibadan?

Is there a relationship between the self-perceived oral health problems and the oral care practices employed by secondary school students in Ibadan?

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CHAPTER FOUR

4.0 METHODOLOGY

4.1 Study Design and Scope

This was a cross-sectional study using a 14-item structured questionnaire (appendix 1), designed to pick up coded data. The data collection spanned a period of 3 months: September to November 2016.

4.2 Study Location

The study was conducted in the city of Ibadan, Oyo state, Nigeria.

4.3 Study Population

The study population was secondary school students in Ibadan.

4.4 Sample Size Calculation

A total of 250 students who gave their consent, including minors whose parents gave their consent, who also assented were given the questionnaire to fill under supervision.

The sample size (N) was determined using the formula: $N = Z^2[PQ]/D^2$ (Charan & Biswas 2013)

Where N = the desired sample size

Z = value of the standard normal deviate, set at 1.96 corresponding to 95% confidence interval

P = estimated prevalence from a related study = 82.5% (Folayan et al, 2014)

q = 1.0 – p

d = degree of accuracy desired (error margin) = 5% = 0.05 at 95% confidence interval.

Thus: $N = \{(1.96)^2(0.825 \times 0.175)\} / (0.05)^2 = 222$. Adjusting for a non-response rate of 10%, the minimum sample size = $222 / (100-10) \% = 247$, rounded up to 250 students.

4.4.1 Sampling Technique

Multistage random pattern was used to select public secondary schools from Ibadan, using the list of secondary schools available from the ministry of education. Approval was obtained from the selected schools' authorities, and in each consenting school, one class was chosen from each grade by simple balloting. Then the students who gave their consent, and the minors whose parents gave their consent, who also assented, were given the questionnaire to fill under supervision. This pattern was continued until the sample size was reached.

4.5 Eligibility Criteria

4.5.1 Inclusion Criteria: all consenting students in the selected secondary schools.

4.5.2 Exclusion Criteria: non consenting students in the selected secondary schools.

4.6 Ethical Consideration

Ethical approval was obtained from the University of Ibadan/University College Hospital Ethical Review Committee. Permission to conduct the study was gotten from the commissioner for Education, and from the principals of selected schools. Consent was obtained from the parents and students who are 18 years and above; assent was also gotten from students less than 18 years of age. An informed consent form was filled and signed by each participant recruited for the study after adequate explanation about the study was given.

4.7 Data Collection

Two hundred and fifty copies of the 14-item structured questionnaire, which sought information on self-perceived oral health problems and oral care practices, as well as their age and gender, was used to collect data from each consenting student under supervision. The data was collected by a team comprising a dentist and 2 research assistants.

4.7.1 Reliability

Reliability of the questionnaire was assessed through the use of Cronbach alpha statistics on SPSS. The Cronbach alpha scale determines the reliability of an instrument from a scale of 0.1 to 1.0. Less than 0.5 is considered not reliable and greater than 0.5 is

considered reliable with 1.0 being the most reliable. (Mohsen Tavakol et al. 2011) Data from the pretest were entered into SPSS in order to determine the reliability of the instrument. Its Cronbach alpha value was 0.7 which makes it reliable.

4.7.2 Validity

Validity of the questionnaire was ensured thus:

- Literature was reviewed extensively in developing the instrument.
- The questionnaire was given to specialists in community dentistry, periodontology and other professionals for evaluation and review for appropriateness.
- The questionnaire was pretested among 20 students who were not included in the study.

4.8 Data Management

In order to ensure proper and effective management of data:

- The questionnaires were serially numbered for recall purposes.
- The research assistants were adequately trained.
- Data collected was checked for completeness and accuracy
- Data collected was kept from unauthorized persons.
- Data was imputed into computer spread sheet and analyzed using software of statistical package of social sciences (SPSS) version 21.0
- The data was sorted, edited and coded manually.
- Frequency counts were run to detect missing cases while the data underwent cleaning.
- Age, a continuous variable, was sorted into age-groups, and summarized using mean, standard deviation and confidence interval, then compared using student t-test while gender, self-perceived oral health problems and oral care practices, which are categorical variables were summarized using proportions and percentages, then compared using chi square statistics.
- The relationship between self-perceived oral health problems and oral care practices was analyzed using Pearson's correlates.
- The results were presented in appropriate charts and tables.
- The data was not saved in other storage devices other than the devoted computer.

CHAPTER FIVE

5.0 RESULTS

Two hundred and fifty questionnaires were distributed among secondary school students in Ibadan, Nigeria. Only 246 provided adequate information for analysis, giving a response rate of 98.4%.

5.1 Demography of the Respondents

The age range of the respondents was between 12 and 23 years, with 166 (67.5%) being within 15-17 years. Forty students (16.3%) were in the age range of 12-14 years, 38 (15.4%) were within 18-20 years while 2 (0.8%) were within 21-23 years. [Figure 1]. The males were 102 (41.5%), and the females were 144 (58.5%), [Figure 2].

5.2 Distribution of the Respondents according to the Self-Perceived Oral Health Problems Among the Age Groups and Genders

Forty-five point five percent of the respondents reported experience of one oral health problem or the other in the past one year [Fig 3]. Statistically, there was no significant relationship between the Self-perceived experience of oral health problem and age group ($\chi^2 = 4.563$, $p = 0.207$) [Table 2], neither was there any apparent trend in the distribution of Self-perceived experience of oral health problem among the groups.

Fifty-three point nine percent of the males reported experience of one oral health problem or the other in the past one year. [Table 3], while 39.6% of the females reported same. Statistically, there was a significant relationship between the gender and the self-perceived experience of oral health problem ($\chi^2 = 4.950$, $p = 0.018$).

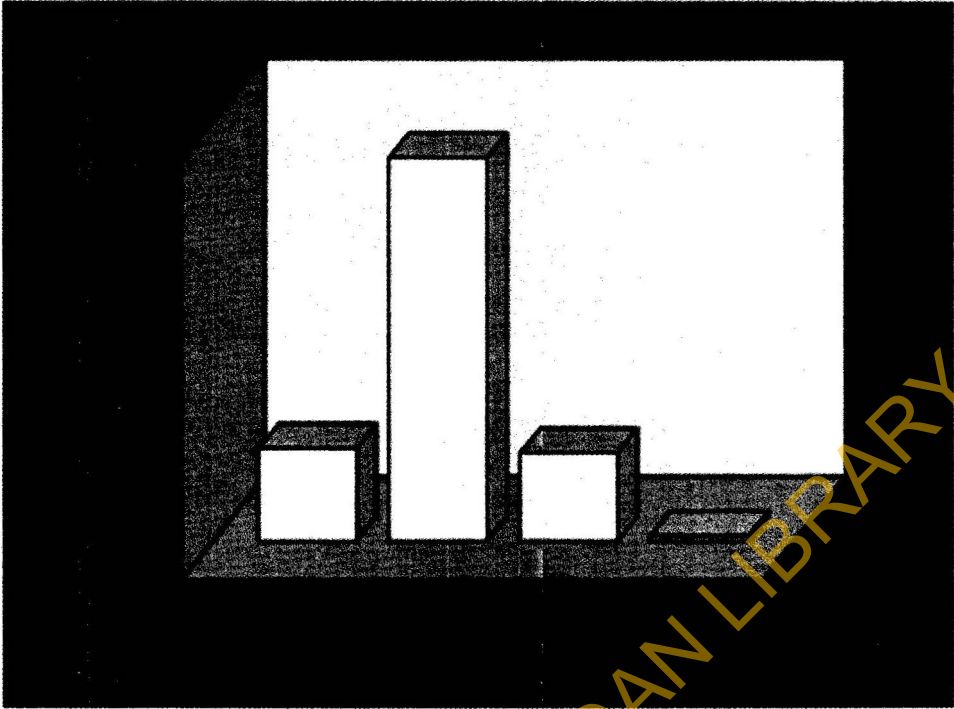


Figure 1: Bar chart showing the percentage distribution of the age groups of the respondents.

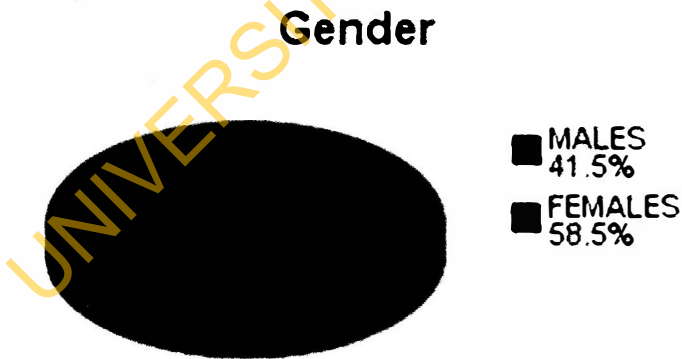


Figure 2: Pie chart showing the gender distribution of the respondents.

Self-perceived experience of oral health problem



Figure 3: Pie chart showing self-perceived experience of oral health problem.

Table 1: Frequency distribution of Self-perceived experience of oral health problems

Self-perceived oral health problems		Frequency(%)
Self-perceived experience of oral health problem	-Yes	112 (45.5)
	-No	134 (54.5)
Self-perceived experience of toothache		110 (44.7)
Self-perceived experience of shaking tooth		29 (11.8)
Self-perceived experience of pain in the gum		77 (31.3)
Self-perceived experience of bleeding from the gum		110 (44.7)
Self-perceived experience of swelling of the gum		55 (22.4)
Positive self-perception that oral health can be improved		224 (91.1)
Personal opinion on whether oral health can be improved	-Yes	224 (91.1)
	-No	22 (8.9)

Self-perceived experience of toothache among the age groups and genders: Toothache was reported by 110 (44.7%) of the participants [Table 1]. Sixty percent of the lowest age group (12-14), reported toothache perception. The least percentage 0 (0.0%) of toothache perception was recorded from the highest age group (21-23) [Table 2]. However, the relationship between the age group and the perception of toothache was not statistically significant ($\chi^2= 7.131$, $p = 0.068$). Among the males, 51 (50.0%) reported perception of toothache [Table 3], while 41.0% of the female reported same. There was also no significant relationship between the gender, and the perception of toothache ($\chi^2= 1.968$, $p = 0.161$).

Self-perceived experience of tooth mobility among the age groups and genders: Among age group 12-14, 20.0%, of mobile teeth was recorded, and 0 (0.0%), from age group 21-23. There was however no significant relationship between tooth mobility and age group ($\chi^2= 3.301$, $p = 0.347$). [Table 2]

Thirteen males (12.7%) and 16 females (11.1%), reported tooth mobility, but the difference was not significant ($\chi^2= 0.153$, $p = 0.695$). [Table 3].

Self-perceived experience of pain in the gum among the age groups and genders: Age group 12-14 reported the highest percentage (42.5%) of pain in the gum, followed by group 15-17 (31.3%), then group 18-20 (21.1%), and the least was from group 21-23 (0.0%). The relationship between pain in the gum and age group was not significant, ($\chi^2= 5.100$, $p = 0.165$). [Table 2], but significantly ($\chi^2= 9.550$, $p = 0.002$), more males 43 (42.2%), than females 34 (23.6%) reported pain in the gum. [Table 3]

Self-perceived experience of bleeding from the gum among the age groups and genders: Bleeding from the gum was reported by 60.0% of age group 12-14, followed by 15-17 (44.0%), then 18-20 (34.2%), and 21-23 (0.0%). The relationship between bleeding from the gum and age group was not statistically significant, ($\chi^2= 7.131$, $p = 0.068$). [Table 2]

Fifty percent of the males and 41.0% of the females reported bleeding from the gum. There was no statistically significant relationship between gender and bleeding from the gum ($\chi^2= 1.968$, $p = 0.161$). [Table 3]

Self-perceived experience of swelling of the gum among the age groups and genders: Age group 15-17 reported the highest percentage of swelling of the gum (24.7%), followed

by 12-14 (20.0%), and the least was from 21-23 (0 0.0%). There was no significant relationship between age group and swelling of the gum ($\chi^2= 2.173, p = 0.537$). [Table 2]. Significantly, ($\chi^2= 16.799, p = 0.000$), more males (35.3%), than females (13.2%) had complaints of swelling of the gum. [Table 3].

Table 2: Comparison of the self-perceived oral health problems of the respondents with their age groups

Self-perceived oral health	Age Groups				χ^2	p
	12-14	15-17	18-20	21-23		
Self-perceived experience of oral health problem					4.563	0.207
	22 (55.0%)	73 (44.0%)	15 (39.5%)	2 (100.0%)		
	18 (45.0%)	93 (56.0%)	23 (60.5%)	0 (0.0%)		
	24 (60.0%)	73 (44.0%)	13(34.2%)	0 (0.0%)	7.131	0.068
	8 (20.0%)	17 (10.2%)	4 (10.5%)	0 (0.0%)	3.301	0.347
	17 (42.5%)	52 (31.3%)	8 (21.1%)	0 (0.0%)	5.100	0.165
	24 (60.0%)	73 (44.0%)	13 (34.2%)	0 (0.0%)	7.131	0.068
	8 (20.0%)	41 (24.7%)	6 (15.8%)	0 (0.0%)	2.173	0.537
					4.425	0.219
	39 (97.5%)	151 (91.0%)	32 (84.2%)	2 (100.0%)		
	1 (2.5%)	15 (9.0%)	6 (15.8%)	0 (0.0%)		

Table 3: Comparison of the self-perceived oral health problems of the respondents with their gender

Self-perceived oral health problems	Gender		χ^2	p
	Male	Female		
Self-perceived experience of oral health problem			4.950	0.018
Yes	55 (53.9%)	57 (39.6%)		
No	47 (46.1%)	87 (60.4%)		
Toothache	51 (50.0%)	59 (41.0%)	1.968	0.161
Mobile teeth	13 (12.7%)	16 (11.1%)	0.153	0.695
Pain in the gum	43 (42.2%)	34 (23.6%)	9.550	0.002
Bleeding from the gum	51 (50.0%)	59 (41.0%)	1.968	0.161
Swelling of the gum	36 (35.3%)	19 (13.2%)	16.799	0.000.
Personal opinion on whether oral health can be improved			3.494	0.047
Yes	97 (95.1%)	127 (88.2%)		
No	5 (4.9%)	17 (11.8%)		

5.3 Respondents' personal opinion on whether oral health can be improved

Ninety-one point nine percent of the respondents were of opinion that their oral health can be improved [Fig 4]. Statistically, there was not a significant relationship between the personal opinion on whether oral health can be improved and age group. ($\chi^2=4.425$, $p = 0. 219$) [Table 2].

Personal opinion on whether oral health can be improved

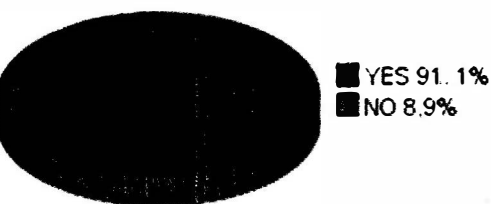


Figure 3: Pie chart showing the personal opinion of the respondents on whether their oral health can be improved

5.4. Distribution of the respondents according to the oral care practices among the age groups and the genders

The assessed oral care practices were: frequency of tooth cleaning, tool used for daily tooth cleaning, texture of brush used, type of dentifrice used, technique of brushing employed, time of daily tooth cleaning, tongue brushing, exposure to dental health education in school, dental service utilization in the past 1 year.

Frequency of tooth cleaning among the age groups and genders: There was a significant relationship between age group and the frequency of tooth cleaning ($\chi^2 = 21.661$, $p = 0.001$). [Table 5]. Among the 12-14-year age group, 57.5% brushed once daily while 50.0% of the 18-20-year age group reported brushing twice daily. There was a significant relationship between gender and the frequency of tooth cleaning ($\chi^2 = 11.530$, $p = 0.003$), with the males brushing mostly once a day while twice and thrice daily tooth brushing was more frequently reported among the females. [Table 6].

Tools used for tooth cleaning among the age groups and genders: Toothbrushes were employed for cleaning by 95.0% of the 12-14 year olds, 95.2% among the 15-17 year olds, 100.0% among the 18-20 year olds, and 100.0% among the 21-23 year olds. However, the relationship between age group and tool used for tooth cleaning is not significant ($\chi^2=3.744$, $p=0.711$). [Table 5].

The relationship between gender and tool used for tooth cleaning was found significant ($\chi^2=6.790$, $p=0.034$) [Table 6].

Texture of brush used among the age groups and genders: In each age group, more children used the medium texture brushes than either the soft or the hard textures. [Table 5]. There was no significant relationship between age group and the texture of brush used ($\chi^2=5.857$, $p=0.439$). Between the genders, the various textures of toothbrushes (medium, soft and hard), were evenly distributed. [Table 6].

Type of dentifrice used among the age groups and genders: Statistically, the age group did not significantly affect the type of dentifrice used, ($\chi^2=6.742$, $p=0.345$). [Table 5]. Among all the age groups, above 72% of the subjects reported use of Fluoride dentifrices, and less than 26% used non Fluoride dentifrices either solely or in combination with Fluoride containing ones. There was no significant relationship between gender and the type of dentifrice used ($\chi^2=5.047$, $p=0.080$). [Table 6].

Technique of brushing employed among the age groups and genders: The reported techniques of brushing employed (Vertical strokes, Both Vertical and Horizontal strokes, Horizontal strokes) were evenly distributed among the age groups. ($\chi^2=25.822$, $p=0.000$). [Table 5]. There was no significant relationship between gender and the technique of brushing employed ($\chi^2=4.179$, $p=0.124$) and the distribution of techniques was grossly even. [Table 6].

Table 4: Frequency distribution of oral care practices by respondents

Oral care practices	Frequency(%)
Frequency of tooth cleaning	
Once a day	130(52.8)
Twice a day	83(33.7)
More than twice a day	33(13.4)
Tool used for daily tooth cleaning	
Tooth brush	236(95.9)
Chewing stick and toothbrush	2(0.8)
Chewing stick	8(3.3)
Texture of brush used	
Medium	108(43.9)
Soft	74(30.1)
Hard	64 (26.0)
Type of dentifrice used	
Fluoride Containing	194(78.9)
Fluoride Containing and Non-Fluoride Containing	44(17.9)
Non-Fluoride Containing	8(3.3)
Technique of brushing employed	
Up and down(vertical) strokes	119(48.4)
Combined (vertical+ horizontal) strokes	52(21.1)
Side to side(horizontal) strokes	75(30.5)
Time of daily tooth cleaning	
Before breakfast	225(91.5)
After breakfast	15(6.1)
After dinner	6(2.4)
Tongue brushing	
Yes	233(94.7)
No	13(5.3)
Dental service utilization in the past 1 year	
Yes	15(6.1)
No	231(93.9)
Exposure to dental health education in school	
Yes	85(34.6)
No	161(65.4)

Time of daily tooth cleaning among the age groups and genders: More than 94% of the participants performed their daily tooth cleaning before breakfast. Less than 3% of them brushed after dinner. [Table 5]. The difference between the gender and the time of daily tooth cleaning was not significant. ($\chi^2=0.378$, $p = 0.828$) [Table 6].

Tongue brushing among the age groups and genders: Among all the age groups, more than 92% of the subjects reported that they brushed their tongue, and there was no significant relationship between the age group and the practice of tongue brushing ($\chi^2=0.707$, $p = 0.872$). [Table 5].

The difference between the gender and the practice of tongue brushing was also not significant ($\chi^2=0.051$, $p = 0.821$) [Table 6].

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Table 5: Comparison of the oral health practices of respondents with age groups

Oral Care Practices	Age Groups				x ²	p
	12-14	15-17	18-20	21-23		
Frequency of Tooth Cleaning					21.661	0.001
Once A Day	23 (57.5%)	95 (57.2%)	12 (31.6%)	0 (0.0%)		
Two Times a Day	13 (32.5%)	51 (30.7%)	19 (50.0%)	0 (0.0%)		
Three Times a Day	4(10.0%)	20(12.0%)	7(18.4%)	2(100.0%)		
Tool Used for Tooth Cleaning					3.744	0.711
Tooth Brush	38 (95.0%)	158 (95.2%)	38 (100.0%)	2 (100.0%)		
Chewing Stick and Toothbrush	1 (2.5%)	1 (0.6%)	0 (0.0%)	0 (0.0%)		
Chewing Stick	1 (2.5%)	7 (4.2%)	0 (0.0%)	0 (0.0%)		
Texture of Brush Used					5.857	0.439
Medium	16 (40.0%)	70 (42.2%)	20 (52.6%)	2 (100.0%)		
Soft	11 (27.5%)	51 (30.7%)	12(31.6%)	0 (0.0%)		
Hard	13 (32.5%)	45 (27.1%)	6 (15.8%)	0 (0.0%)		
Type of Dentifrice Used					6.742	0.345
Fluoride Dentifrice	29 (72.5%)	128 (77.1%)	35 (92.1%)	2 (100.0%)		
Both Fluoride and Non-Fluoride Dentifrices	10 (25.0%)	31 (18.7%)	3 (7.9%)	0 (0.0%)		
Non-Fluoride Dentifrices	1 (2.5%)	7 (4.2%)	0 (0.0%)	0 (0.0%)		
Technique of Brushing Employed					25.822	<0.001
Vertical strokes Both						
Vertical and Horizontal strokes	11 (27.5%)	90 (54.2%)	18 (47.4%)	0 (0.0%)		
Horizontal strokes	19 (47.5%)	27 (16.3%)	6 (15.8%)	0 (0.0%)		
	10 (25.0%)	49 (29.5%)	14 (36.8%)	2(100.0%)		
Time of Daily Tooth Cleaning					83.133	<0.001
Before Breakfast	36 (90.0%)	153 (92.2%)	36 (94.7%)	0 (0.0%)		
After Breakfast	4 (10.0%)	9 (5.4%)	2 (5.3%)	0 (0.0%)		
After Dinner	0 (0.0%)	4 (2.4%)	0 (0.0%)	2 (100.0%)		
Tongue Brushing					0.707	0.872
Yes	38 (95.0%)	158 (95.2%)	35 (92.1%)	2 (100.0%)		
No	2 (5.0%)	8 (4.8%)	3 (7.9%)	0 (0.0%)		
Exposure to Dental Health Education in School					5.422	0.143
Yes	17 (42.5%)	60 (36.1%)	8 (21.1%)	0 (0.0%)		
No	23 (57.5%)	106 (63.9%)	30 (78.9%)	2 (100.0%)		
Dental Service Utilization in The Last 1 Year					0.614	0.893
Yes	3 (7.5%)	9 (5.4%)	3 (7.9%)	0 (0.0%)		
No	37 (92.5%)	157 (94.6%)	35 (92.1%)	2 (100.0%)		

Table 6: Comparison of the oral health practices of respondents with their gender

Oral Care Practices	Gender		x ²	p
	Male	Female		
Frequency of Tooth Cleaning			11.530	0.003
Once a Day	67 (65.7%)	63 (43.8%)		
Two Times a Day	25 (24.5%)	58 (40.3%)		
Three Times a Day	10 (9.8%)	23 (16.0%)		
Tool Used for Tooth Cleaning			6.790	0.034
Tooth Brush	94 (92.2%)	142 (98.6%)		
Chewing Stick and Toothbrush	2 (2.0%)	0 (0.0%)		
Chewing Stick	6 (5.9%)	2 (1.4%)		
Texture of Brush Used			35.152	0.000
medium	44 (43.1%)	64 (44.4%)		
soft	14 (13.7%)	60 (41.7%)		
hard	44 (43.1%)	20 (13.9%)		
Type of Dentifrice Used			5.047	0.080
Fluoride Dentifrice	75 (73.5%)	119 (82.6%)		
Fluoride and Non-Fluoride Dentifrices	21 (20.6%)	23 (16.0%)		
Non-Fluoride Dentifrices	6 (5.9%)	2 (1.4%)		
Technique of Brushing Employed			4.179	0.124
Vertical strokes	45 (44.1%)	74 (51.4%)		
Both Vertical and Horizontal strokes	28 (27.5%)	24 (16.7%)		
Horizontal strokes	29 (28.4%)	46 (31.9%)		
Time of Daily Tooth Cleaning			0.378	0.828
Before Breakfast	92 (90.2%)	133 (92.4%)		
After Breakfast	7 (6.9%)	8 (5.6%)		
After Dinner	3 (2.9%)	3 (2.1%)		
Tongue Brushing			0.051	0.821
Yes	97 (95.1%)	136 (94.4%)		
No	5 (4.9%)	8 (5.6%)		
Exposure to Dental Health Education in School			3.381	0.066
Yes				
No	42 (41.2%)	43 (29.9%)		
	60 (58.8%)	101 (70.1%)		
Utilized Dental Services in The Past 1 Year			0.927	0.336
Yes				
No	8 (7.8%)	7 (4.9%)		
	94 (92.2%)	137 (95.1%)		

Exposure to dental health education in school among the age groups and genders: Eighty-five (34.6%) reported being taught dental health education in school while 161 (65.4%) reported that they were not taught. These reports were not statistically different among the age groups. ($\chi^2 = 5.422$, $p = 0.143$) [Table 5].

There was no significant relationship between the gender and exposure to dental health education in school either ($\chi^2 = 3.381$, $p = 0.066$) [Table 6].

Dental service utilization in the past 1 year among the age groups and genders: Across all the age groups, the report of utilization of dental services within the past 1 year was less than 8%, and utilization was not significantly affected by age. ($\chi^2 = 0.614$, $p = 0.893$) [Table 5].

Also, the difference between the gender and the utilization of dental services within the past 1 year was not significant ($\chi^2 = 0.927$, $p = 0.336$) [Table 6].

5.5 Relationship between the self-perceived oral health problems and the oral health practices.

The analysis for association between the self-perceived oral health problems and the oral health practices, as presented in Table 7, showed that statistically significant relationship exists between self-perceived experience of oral health problem in the past one year and variables such as the tool used for tooth cleaning ($\chi^2 = 7.457$, $p = 0.024$), the type of dentifrice used ($\chi^2 = 12.347$, $p = 0.002$), the technique of brushing employed ($\chi^2 = 6.916$, $p = 0.031$), the time of tooth cleaning ($\chi^2 = 12.309$, $p = 0.002$), and exposure to dental health education ($\chi^2 = 10.967$, $p = 0.001$).

Statistically significant relationship was also found between self-perceived pain in the gum and practices like frequency of daily tooth cleaning ($\chi^2 = 6.665$, $p = 0.036$), technique of brushing employed ($\chi^2 = 12.039$, $p = 0.002$), and tongue brushing ($\chi^2 = 6.254$, $p = 0.012$). [Table 8]. From Table 9, self-perceived toothache showed a statistically significant relationship with time of daily tooth cleaning ($\chi^2 = 5.986$, $p = 0.050$).

Self-perceived tooth mobility related significantly with exposure to dental health education in school ($\chi^2 = 4.287$, $p = 0.038$), as well as with dental service utilization in the past 1 year ($\chi^2 = 7.130$, $p = 0.021$). [Table 10].

In Table 11, self-perceived bleeding from the gum is shown to also relate significantly with time of tooth cleaning ($\chi^2 = 5.986, p = 0.050$). Self-perceived swelling of the gum showed statistically significant relationship with both texture of brush used ($\chi^2 = 9.709, p = 0.008$), and the technique of brushing employed ($\chi^2 = 8.952, p = 0.011$). [Table 12].

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Table 7: Comparison of self-perceived oral health problems of respondents with selected oral health practices

Oral Health Practices	Self-perceived experience of oral health problem			X ²	P value
	Yes	No	Total		
Frequency of daily				0.605	0.739
Once a day	61 (46.9%)	69 (53.1%)	130 (100.0%)		
Twice a day	38 (45.8%)	45 (54.2%)	83 (100.0%)		
More than twice a day	13 (39.4%)	20 (60.6%)	33 (100.0%)		
Tool used for tooth cleaning				7.457	0.024
Tooth brush	105 (44.5%)	131 (55.5%)	236 (100.0%)		
Toothbrush and Chewing stick	0 (0.0%)	2 (100.0%)	2 (100.0%)		
Chewing stick	7 (87.5%)	1 (12.5%)	8 (100.0%)		
Texture of brush used				0.991	0.609
Medium	53 (49.1%)	55 (50.9%)	108 (100.0%)		
Soft	32 (43.2%)	42 (56.8%)	74 (100.0%)		
Hard	27 (42.2%)	37 (57.8%)	64 (100.0%)		
Type of dentifrice used				12.347	0.002
Fluoride	78 (40.2%)	116 (59.8%)	194 (100.0%)		
Fluoride and others	27 (61.4%)	17 (38.6%)	44 (100.0%)		
Others	7 (87.5%)	1 (12.5%)	8 (100.0%)		
Technique of brushing employed					
Up and down(vertical) strokes	48 (40.3%)	71 (59.7%)	119 (100.0%)		
Combined (vertical+ horizontal) strokes				6.916	0.031
Side to side(horizontal) strokes	32 (61.5%)	20 (38.5%)	52 (100.0%)		
	32 (42.7%)	43 (57.3%)	75 (100.0%)		
Time of tooth cleaning				12.309	0.002
Before breakfast	95 (42.2%)	130 (57.8%)	225 (100.0%)		
After breakfast	13 (86.7%)	2 (13.3%)	15 (100.0%)		
After dinner	4 (66.7%)	2 (33.3%)	6 (100.0%)		
Tongue brushing				0.276	0.409
Yes	107 (45.9%)	126 (54.1%)	233 (100.0%)		
No	5 (38.5%)	8 (61.5%)	13 (100.0%)		
Exposure to dental health education				10.967	0.001
Yes	51 (60.0%)	34 (40.0%)	85 (100.0%)		
No	61 (37.9%)	100 (62.1%)	161 (100.0%)		
Dental service utilization in the past 1 year				0.392	0.358
Yes	8 (53.3%)	7 (46.7%)	15 (100.0%)		
No	104 (45.0%)	127 (55.0%)	231 (100.0%)		

Table 8: Comparison of self-perceived pain in the gum among respondents with selected oral health practices

Oral Health Practices	Experience of Pain in the Gum			X ²	P value
	No	Yes	Total		
Frequency of daily tooth cleaning:				6.665	0.036
once a day	80 (61.5%)	50 (38.5%)	130 (100.0%)		
Twice a day	63 (75.9%)	20 (24.1%)	83 (100.0%)		
More than twice a day	26 (78.8%)	7 (21.2%)	33 (100.0%)		
Tool used for tooth cleaning				0.483	0.785
Chewing stick	5 (62.5%)	3 (37.5%)	8 (100.0%)		
Tooth brush	163 (69.1%)	73 (30.9%)	236 (100.0%)		
Chewing stick and toothbrush	1 (50.0%)	1 (50.0%)	2 (100.0%)		
Texture of brush used				4.955	0.084
Medium	77 (71.3%)	31 (28.7%)	108 (100.0%)		
Soft	55 (74.3%)	19 (25.7%)	74 (100.0%)		
Hard	37 (57.8%)	27 (42.2%)	64 (100.0%)		
Type of dentifrice used				1.576	0.455
Fluoride	137 (70.6%)	57 (29.4%)	194 (100.0%)		
Fluoride and others	27 (61.4%)	17 (38.6%)	44 (100.0%)		
Others	5 (62.5%)	3 (37.5%)	8 (100.0%)		
Technique of brushing employed				012.03	0.002
Up and down(vertical) strokes	94 (79.0%)	25 (21.0%)	119 (100.0%)		
Combined (vertical+ horizontal) strokes	28 (54.9%)	23 (45.1%)	51 (100.0%)		
Side to side(horizontal) strokes	47 (61.8%)	29 (38.2%)	76 (100.0%)		
Time of tooth cleaning				1.625	0.444
Before breakfast	157 (69.8%)	68 (30.2%)	225 (100.0%)		
After breakfast	9 (60.0%)	6 (40.0%)	15 (100.0%)		
After dinner	3 (50.0%)	3 (50.0%)	6 (100.0%)		
Tongue brushing				6.254	0.012
Yes	156 (67.0%)	77 (33.0%)	233 (100.0%)		
No	13 (100.0%)	0 (0.0%)	13 (100.0%)		
Exposure to dental health Education				0.963	0.326
Yes	55 (64.7%)	30 (35.3%)	85 (100.0%)		
No	114 (70.8%)	47 (29.2%)	161 (100.0%)		
Dental service utilization in the past 1 year				0.562	0.314
Yes	9 (60.0%)	6 (40.0%)	15 (100.0%)		
No	160 (69.3%)	71 (30.7%)	231 (100.0%)		

Table 9: Comparison of self-perceived toothache among respondents with selected oral health practices

Oral Health Practices	Experience of Toothache		Total	X ²	P value
	No (%)	Yes (%)			
Frequency of tooth cleaning				4.867	0.088
Once a day	65 (50.0%)	65 (50.0%)	130 (100.0%)		
Two times a day	54 (65.1%)	29 (34.9%)	83 (100.0%)		
Three times a day	17 (51.5%)	16 (48.5%)	33 (100.0%)		
Tool used for tooth cleaning				1.086	0.581
Tooth brush	132 (55.9%)	104 (44.1%)	236 (100.0%)		
Chewing stick and toothbrush	1 (50.0%)	1 (50.0%)	2 (100.0%)		
Chewing stick	3 (37.5%)	5 (62.5%)	8 (100.0%)		
Texture of brush used				1.890	0.389
Medium	63 (58.3%)	45 (41.7%)	108 (100.0%)		
Soft	36 (48.6%)	38 (51.4%)	74 (100.0%)		
Hard	37 (57.8%)	27 (42.2%)	64 (100.0%)		
Type of dentifrice used				3.432	0.180
Fluoride	113 (58.2%)	81 (41.8%)	194 (100.0%)		
Fluoride and others	20 (45.5%)	24 (54.5%)	44 (100.0%)		
Others	3 (37.5%)	5 (62.5%)	8 (100.0%)		
Technique of brushing employed				4.441	0.109
Up and down(vertical) strokes	74 (62.2%)	45 (37.8%)	119 (100.0%)		
Combined (vertical+ horizontal) strokes	25 (49.0%)	26 (51.0%)	51 (100.0%)		
Side to side(horizontal) strokes	37 (48.7%)	39 (51.3%)	76 (100.0%)		
Time of daily tooth cleaning				5.986	0.050
Before breakfast	120 (53.3%)	105 (46.7%)	225 (100.0%)		
After breakfast	10 (66.7%)	5 (33.3%)	15 (100.0%)		
After dinner	6 (100.0%)	0 (0.0%)	6 (100.0%)		
Tongue brushing				1.080	0.228
Yes	127 (54.5%)	106 (45.5%)	233 (100.0%)		
No	9 (69.2%)	4 (30.8%)	13 (100.0%)		
Exposure to Dental health education				1.159	0.173
Yes	43 (50.6%)	42 (49.4%)	85 (100.0%)		
No	93 (57.8%)	68 (42.2%)	161 (100.0%)		
Dental service utilization in the past 1 year				0.837	0.261
Yes	10 (66.7%)	5 (33.3%)	15 (100.0%)		
No	126 (54.5%)	105 (45.5%)	231 (100.0%)		

Table 10: Comparison of self-perceived tooth mobility among respondents with selected oral health practices

Oral Health Practices	Experience of Tooth Mobility			Chi square	P value
	No (%)	Yes (%)	Total		
Frequency of tooth cleaning				1.254	0.534
Once a day	113 (86.9%)	17 (13.1%)	130 (100.0%)		
Two times a day	73 (88.0%)	10 (12.0%)	83 (100.0%)		
Three times a day	31 (93.9%)	2 (6.1%)	33 (100.0%)		
Tool used for tooth cleaning				1.393	0.498
Chewing stick	8 (100.0%)	0 (0.0%)	8 (100.0%)		
Tooth brush	207 (87.7)	29 (12.3%)	236 (100.0%)		
Chewing stick and toothbrush	2 (100.0%)	0 (0.0%)	2 (100.0%)		
Texture of brush used				2.447	0.294
Medium	97 (89.8%)	11 (10.2%)	108 (100.0%)		
Soft	67 (90.5%)	7 (9.5%)	74 (100.0%)		
Hard	53 (82.8%)	11 (17.2%)	64 (100.0%)		
Type of dentifrice used				1.602	0.449
Fluoride	169 (87.1%)	25 (12.9%)	194 (100.0%)		
Fluoride and others	40 (90.9%)	4 (9.1%)	44 (100.0%)		
Others	8 (100.0%)	0 (0.0%)	8 (100.0%)		
Technique of brushing employed				1.929	0.381
Up and down(vertical) strokes	104 (87.4%)	15 (12.6%)	119 (100.0%)		
Combined (vertical+ horizontal) strokes	43 (84.3%)	8 (15.7%)	51 (100.0%)		
Side to side(horizontal) strokes	70 (92.1%)	6 (7.9%)	76 (100.0%)		
Time of tooth cleaning				1.786	0.409
Before breakfast	199 (88.4%)	26 (11.6%)	225 (100.0%)		
After breakfast	12 (80.0%)	3 (20.0%)	15 (100.0%)		
After dinner	6 (100.0%)	0 (0.0%)	6 (100.0%)		
Tongue brushing				1.834	0.176
Yes	204 (87.6%)	29 (12.4%)	233 (100.0%)		
No	13 (100.0%)	0 (0.0%)	13 (100.0%)		
Exposure to dental health education in school				4.287	0.038
Yes	70 (82.4%)	15 (17.6%)	85 (100.0%)		
No	147 (91.3%)	14 (8.7%)	161 (100.0%)		
Dental service utilization in the past 1 year				7.130	0.021
Yes	10 (66.7%)	5 (33.3%)	15 (100.0%)		
No	207 (89.6%)	24 (10.4%)	231 (100.0%)		

Table 11: Comparison of self-perceived bleeding from the gum among respondents with selected oral health practices

Oral Health Practices	Bleeding From The Gum			X ²	p
	No	Yes	Total		
Frequency of tooth cleaning				4.867	0.088
Once a day	65 (50.0%)	65 (50.0%)	130(100.0%)		
Two times a day	54 (65.1%)	29 (34.9%)	83 (100.0%)		
Three times a day	17 (51.5%)	16 (48.5%)	33 (100.0%)		
Tool used for tooth cleaning				1.086	0.581
Chewing stick	3 (37.5%)	5 (62.5%)	8 (100.0%)		
Tooth brush	132(55.9%)	104(44.1%)	236(100.0%)		
Chewing stick and toothbrush	1(50.0%)	1(50.0%)	2(100.0%)		
Texture of brush used				1.890	0.389
Medium	63 (58.3%)	45 (41.7%)	108 (100.0%)		
Soft	36 (48.6%)	38 (51.4%)	74 (100.0%)		
Hard	37 (57.8%)	27 (42.2%)	64 (100.0%)		
Type of dentifrice used				3.432	0.180
Fluoride	113(58.2%)	81 (41.8%)	194(100.0%)		
Fluoride and others	20 (45.5%)	24 (54.5%)	44 (100.0%)		
Others	3(37.5%)	5(62.5%)	8(100.0%)		
Technique of brushing employed					
Up and down(vertical) strokes	74 (62.2%)	45 (37.8%)	119 (100.0%)	4.441	0.109
Combined (vertical+ horizontal) strokes	25 (49.0%)	26 (51.0%)	51 (100.0%)		
Side to side(horizontal) strokes	37 (48.7%)	39 (51.3%)	76 (100.0%)		
Time of tooth cleaning				5.986	0.050
Before breakfast	120 (53.3%)	105 (46.7%)	225 (100.0%)		
After breakfast	10 (66.7%)	5 (33.3%)	15 (100.0%)		
After dinner	6(100.0%)	0(0.0%)	6(100.0%)		
Tongue brushing				1.080	0.228
Yes	127(54.5%)	106(45.5%)	233(100.0%)		
No	9(69.2%)	4(30.8%)	13(100.0%)		
Exposure to Dental Health Education				1.159	0.173
Yes	43 (50.6%)	42 (49.4%)	85 (100.0%)		
No	93 (57.8%)	68 (42.2%)	161(100.0%)		
Dental service utilization in the past 1 year				0.837	0.261
Yes	10 (66.7%)	5 (33.3%)	15 (100.0%)		
No	126(54.5%)	105(45.5%)	231(100.0%)		

Table 12: Comparison of self-perceived swelling of the gum among respondents with selected oral health practices

Oral Health Practices	Swelling of the Gum			X ²	p
	No	Yes	Total		
Frequency of tooth cleaning				0.519	0.771
Once a day	99 (76.2%)	31 (23.8%)	130 (100.0%)		
Two times a day	65 (78.3%)	18 (21.7%)	83 (100.0%)		
Three times a day	27 (81.8%)	6 (18.2%)	33 (100.0%)		
Tool used for tooth cleaning				4.588	0.101
Chewing stick	4 (50.0%)	4 (50.0%)	8 (100.0%)		
Tooth brush	186 (78.8%)	50 (21.2%)	236 (100.0%)		
Chewing stick and toothbrush	1 (50.0%)	1 (50.0%)	1 (100.0%)		
Texture of brush used				9.709	0.008
Medium	91 (84.3%)	17 (15.7%)	108 (100.0%)		
Soft	59 (79.7%)	15 (20.3%)	74 (100.0%)		
Hard	41 (64.1%)	23 (35.9%)	64 (100.0%)		
Type of dentifrice used				3.669	0.160
Fluoride	152 (78.4%)	42 (21.6%)	194 (100.0%)		
Fluoride and others	35 (79.5%)	9 (20.5%)	44 (100.0%)		
Others	4 (50.0%)	4 (50.0%)	8 (100.0%)		
Technique of brushing employed				8.952	0.011
Up and down(vertical) strokes	102 (85.7%)	17 (14.3%)	119 (100.0%)		
Combined (vertical+ horizontal) strokes	37 (72.5%)	14 (27.5%)	51 (100.0%)		
Side to side(horizontal) strokes	52 (68.4%)	24 (31.6%)	76 (100.0%)		
Time of tooth cleaning				0.275	0.872
Before breakfast	175 (77.8%)	50 (22.2%)	225 (100.0%)		
After breakfast	11 (73.3%)	4 (26.7%)	15 (100.0%)		
After dinner	5 (83.3%)	1 (16.7%)	6 (100.0%)		
Tongue brushing				1.701	0.169
Yes	179 (76.8%)	54 (23.2%)	233 (100.0%)		
No	12 (92.3%)	1 (7.7%)	13 (100.0%)		
Exposure to Dental Health Education				0.103	0.433
Yes	65 (76.5%)	20 (23.5%)	85 (100.0%)		
No	126 (78.3%)	35 (21.7%)	161 (100.0%)		
Dental service utilization in the past 1 year				1.109	0.225
Yes	10 (66.7%)	5 (33.3%)	15 (100.0%)		
No	181 (78.4%)	50 (21.6%)	231 (100.0%)		

CHAPTER 6

6.0

DISCUSSION

6.1 Discussion

This study assessed for relationship between the self-perceived oral health problems and oral care practices among secondary school students in Ibadan. It also assessed for relationship between the age groups and self-perceived oral health problems as well as relationship between the genders and the oral care practices.

Almost half (45.5%) of the respondents reported that they experienced one oral health problem or the other within the past 1 year. This is close to the report from China, where 41% of the adolescents they studied claimed they had experienced toothache or other symptoms during the previous 12 months (Jiang et al. 2005). Also, the study in Tanzania showed that substantial proportions of their students reported experience of oral problems which had impacts on eating and teeth cleaning (Mashoto et al; 2009).

Statistically, there was a significant relationship between the gender and the Self-perceived experience of oral health problem in this study ($\chi^2= 4.950, p = 0.018$), and this agrees with the results of Azodo et al, (2012), which suggested gender influence on the oral health perception and practices among medical house officers they studied in Nigeria. A higher percentage of the males (53.9%) in this study reported experience of oral health problems, than females (39.6%). This is also in keeping with the findings of Ostberg et al. (1999); Ostberg et al. (2001); and Azodo et al. (2012); in which girls perceived their oral health to be good to a higher degree than did boys.

Among the various self-perceived oral health problems recorded, the most frequent was toothache: (44.7%). The studies of Mashoto et al., (2009); Jiang et al.(2005) and Schuch et al. (2015) also showed that dental pain was prominent among the oral problems experienced by their subjects. Bastos et al, (2008), documented that younger subjects were more likely to report toothache. Having oral pain is one of the most important significant predictors of perceived oral health noted by Atchison et al. (1997) and Schuch et al, (2015).

Thus the finding that toothache was the most frequent recorded oral health problems perceived among the students in this study could have contributed to the relatively high report of self-perceived oral health problems.

Although there was no significant relationship between the gender and the perception of toothache ($\chi^2 = 1.968$, $p = 0.161$), a higher percentage of males (50.0%), than females (41.0%) reported perception of toothache. This may have resulted from the previous finding that females, in comparison to males, significantly gave good attention to their oral health and visited the dentist (Azodo & Unamatokpa, 2012). Davidson et al, (1997) also reported that female gender, among other factors showed a significant positive relationship with better personal oral hygiene practices. Also in this study, while twice and thrice daily tooth brushing was more frequently reported among the females, the males brushed mostly once a day, and the relationship between gender and the frequency of tooth cleaning was found significant.

Self-perceived toothache related significantly with time of daily tooth cleaning ($\chi^2 = 5.986$, $p = 0.050$) in this study. Majority of the participants performed their daily tooth cleaning before breakfast. Less than 3% of them brushed after dinner, and there was a statistically significant relationship between self-perceived experience of oral health problem and time of tooth cleaning ($\chi^2 = 12.309$, $p = 0.002$). It is possible therefore, that the additional brushing at night, practiced more among the females who brushed twice and thrice daily, also reduced their self-perceived experience of oral health problem (Gillette WB et al. 1980).

In this study also, statistical analysis showed an association between the report of self-perceived experience of oral health problems and tool used for tooth cleaning: ($\chi^2 = 7.457$, $p = 0.024$). It was observed that though both genders used the modern toothbrushes predominantly, the use of chewing stick was significantly more among the males ($\chi^2 = 6.790$, $p = 0.034$), and a higher percentage of the males (53.9%) reported experience of oral health problems, than females (39.6%). Though reviews of several studies showed evidences that traditional devices like the chewing stick help in promoting oral health leading to the recognition and encouragement of their use by WHO and other institutions (Oral Health Indices), it may be necessary to assess how these traditional tools are used

among these individuals, and ensure that proper techniques are adopted for good results (Almas et al, 1995; Dahiya et al, 2012; Hooda et al, 2011).

Self-perceived experience of oral health problem was also found to be related to the type of dentifrice used ($X^2 = 12.347$, $p = 0.002$). The use of non-Fluoride dentifrices was also more among the males. In comparison with males, females have been reported to more significantly choose toothpaste following dentist recommendations (Azodo & Unamatokpa, 2012). Also considering the myriad of evidence that Fluoride has several protective effects on teeth, it may be implied that one of the reasons more males reported experience of toothaches may be because more of them were not exposed to the protective benefits of Fluoride (Carey, 2014; Faller & Eversole, 2013; Faller et al, 2014; Mohammed et al, 2014). However, Fluoride containing tooth pastes were the predominant dentifrices used by these students, with above 72% of the subjects reporting use of Fluoride dentifrices among all the age groups, and less than 26% using non-Fluoride dentifrices either solely or in combination with Fluoride containing ones. This is higher than the observation of Jiang et al, 2005, among the Chinese adolescents they studied: only 48% of their students used fluoridated toothpaste.

The highest record of mobile teeth: 20.0%, was from among age group 12-14. This could be due to the fact that the common cause of tooth mobility among children is exfoliation of primary teeth, which is more likely to be found among the youngest age group in this study. There was however no statistically significant relationship between tooth mobility and the assessed age groups. Also, though the difference was not statistically significant, slightly more males (12.7%) reported tooth mobility, than females (11.1%). Considering the report that girls showed earlier tooth eruption compared to boys (Lakshmappa et al, 2011), it may be more likely to find more boys still undergoing exfoliation within the secondary school age than girls.

In this study, the records of pain in the gum and bleeding from the gum showed an inverse relationship with increasing age among these students. Pain in the gum, as well as bleeding from the gum, (which among this population, is often caused by gingivitis (Chauhan et al, 2012), could be diminishing with increasing age as the students' personal oral hygiene measures improved with increasing maturity. Among the Chinese adolescents studied by Jiang et al, 2005), 9% of the students reported having "poor" or "very poor"

gums. It is also statistically significant that more males than females reported pain in the gum ($X^2 = 9.550$, $p = 0.002$). This again may have resulted from the reports that females took better oral care measures than males (Azodo & Unamatokpa, 2012; Davidson et al, 1997).

The report of self-perceived pain in the gum was found to have a statistically significant relationship with tongue brushing ($x^2 = 6.254$, $p = 0.012$). Considering studies which demonstrated that tongue brushing produced statistically significant reductions in salivary mutans streptococci counts plaque levels (Rupesh et al, 2012; Matsui et al, 2014), it could be inferred that relative higher plaque accumulation in those who did not brush their tongue could have resulted in the higher occurrence of gingival inflammation. Statistically significant relationships were observed between self-perceived pain in the gum and the technique of tooth brushing employed ($x^2 = 12.039$, $p = 0.002$); between self-perceived swelling of the gum and texture of brush used ($x^2 = 9.709$, $p = 0.008$); and between self-perceived pain in the gum and frequency of daily tooth cleaning ($x^2 = 6.665$, $p = 0.036$). Previous studies have shown that overly vigorous tooth brushing, using wrong brush texture or technique often leads to gingival irritation among other problems.

In this study, there was no significant relationship between gender and bleeding from the gum. However, more females than males reported bleeding from the gum. This conforms to such findings that gingival bleeding is influenced by the female hormones estrogen and progesterone, with the gingival bleeding index being increased significantly during the menstrual cycle, and during ovulation, features which are consistent with the age group of females involved in this study (Women's Hormones and Dental Health; Khosravisamani et al, 2014).

There was a significant relationship between age group and the frequency of tooth cleaning ($x^2 = 21.661$, $p = 0.001$), with more of the younger age groups brushing once daily, and more of the older age groups brushing twice daily. Olusile et al, 2014, noted that age was significantly related to frequency of tooth cleaning. Age was also one of the predictive factors found by Folayan et al, 2014, for the application of the components of the oral self-care measures. Similar to the report of Oke et al, 2011, that many people in the cities of Nigeria used toothbrushes, toothbrushes were employed for cleaning by most of the children in this study. Lawal et al.'s study in Ibadan, 2013, also showed that among their

participants, 50.3% used toothbrush solely to clean their teeth, 30.5% used both toothbrush and chewing stick while 18.5% used chewing sticks alone.

Less than half of the subjects reported being taught dental health education in school, and there was a significant relationship between self-perceived experience of oral health problems and exposure to dental health education ($\chi^2 = 10.967$, $p = 0.001$). According to Atchison et al, 1997, one of the most significant predictors of perceived oral health is education. These students spend considerable time in school, making it an important environment for the inculcation and development of healthy oral health practices. School programmes should be scheduled to effectively impact oral health awareness and behavior, so as to improve the oral health status of these young people.

Ninety-one point nine percent of the respondents were of opinion that their oral health can be improved, yet across all the age groups, the report of utilization of dental services within the past 1 year was very poor (less than 8%). As found in other studies in developing nations, even when people perceive that they have oral problems like pain, they tend to self-manage the situation till it gets to a distressing state, before they seek professional care (Tanwir et al, 2006). In fact, Oke et al, 2011, documented that in both rural and urban low- to- middle socio-economic classes in parts of Nigeria, consultation with traditional oral healthcare practitioners was a practice commonly observed in all the study sites; ill defined "worms" were said to be the causative agents of all the oral health problems; and the dental care remedies used included herbal preparations and battery water.

The percentage of the participants in this study that utilized Dental services is even lower than in the report of Folayan et al, 2014, in which 12.7% of their respondents had visited the dental clinic for a check-up in the last one year; and that of Jiang et al, 2005, where 26% of the Chinese adolescents they studied visited a dentist during the previous 12 months. Lawal et al, 2013, reported that nearly all of their participants knew that oral health services are available in most hospitals, yet only few had ever visited a Dentist, and according to Ogunrinde et al, 2015, among secondary school adolescents in Ibadan, only few respondents had visited dentists before, yet Azodo et al, 2012, indicated the fruitfulness of utilizing Dental services by students: they noted that many of the students who visited the dentist complied with the dentist instruction, choosing toothpaste following dentist recommendations.

6.2 Conclusion

This study suggested that there is a relationship between several self-perceived oral health problems and the oral care practices employed by secondary school students in Ibadan. It also showed that age and gender significantly influenced some of the practices and the problems experienced.

6.3 Limitation of The Study

1. This study did not exhaust all the known self-perceived oral health problems and oral care practices possible among this population.
2. Being a cross sectional survey, control of possible confounders was not done.
3. The students filled out the questionnaire themselves; so untrue answers, intentional or non-intentional, may have been given.

6.4 Recommendations

To achieve the World Health Organization goal of ensuring increased uptake of preventive oral care by 2020 (World Health Organization, 2013), healthy oral self-care habits should be taught, provided and ensured among all age groups, and for the school children. It will be important to include cleaning the mouth twice daily, use of medium textured toothbrushes and Fluoride toothpastes (Adair, 2006; Davies, 2003), In addition, it is important to encourage supplementation of such self-care with regular dental check-ups. A cohort study design is also recommended and may give an even better picture of the types of associations between these factors.

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APPENDICES

APPENDIX 1: COPY OF QUESTIONNAIRE

QUESTIONNAIRE

I am Dr. Ikeobi Ada Esther, a Masters student of the Postgraduate School, University of Ibadan. I am researching the **Relationship between Self-Perceived Oral Health Problems and Oral Care Practices among Secondary School Students in Ibadan.**

Your response will be treated confidentially.

Serial number

[A] BIODATA: 1. Gender- M..... F..... 2. Age.....

[B] SELF PERCEPTION OF ORAL HEALTH PROBLEMS (Please tick the appropriate options)

3. Do you think you have any problem in your mouth? A. Yes B. No

C. I don't know

4. Do you think the health of your mouth can be improved? A. Yes B. No

C. I don't know

5. Have you had any of the following oral problems in the last one year? (Which ones?)

a. Tooth ache A. Yes B. No C. I don't know

b. Shaking tooth A. Yes B. No C. I don't know

c. Pain in the gum A. Yes B. No C. I don't know

d. Blood from the gum A. Yes B. No C. I don't know

e. Swelling of the gum A. Yes B. No C. I don't know

f. Smelling of the mouth A. Yes B. No C. I don't know

g. Other problems

[C] PERSONAL ORAL CARE.

6. How often do you clean your teeth? a. once a day b. two times a day c. three times a day

7. When do you clean your mouth? a. before breakfast b. after breakfast c. before dinner d. after dinner

8. Which of these do you use to clean your mouth? a. chewing stick b. toothbrush c. dental floss d. cotton wool e. piece of cloth f. others.....

9. What is the name your toothpaste?
10. What is the texture of your brush? a. hard b. medium c. soft
11. Which of these methods do you use when cleaning your teeth? a. up and down b. side to side c. both
12. Do you brush your tongue? A. Yes. B. No C. I don't know
- [E] PAST DENTAL HISTORY
13. Have you visited a dentist before? A.Yes B. No. C.I don't know.
14. Do you receive Dental Health Education in your school? A.Yes B. No. C.I don't know.

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APPENDIX 2: COPY OF INFORMED CONSENT FORM

INFORMED CONSENT FORM

IRB RESEARCH NUMBER...UI/EC/16/0231

THIS APPROVAL WILL ELAPSE ON...08/09/2017

Title: RELATIONSHIP BETWEEN SELF-PERCEIVED ORAL HEALTH PROBLEMS AND ORAL CARE PRACTICES AMONG SECONDARY SCHOOL STUDENTS IN IBADAN

Researchers: This study is being conducted by Dr Ikeobi Ada Esther, a Masters student of the Postgraduate School, University of Ibadan.

Sponsors: It is self-sponsored.

Purpose of the research: The purpose of this research is to find out the relationship between self-perceived oral health problems and oral care practices among secondary school students in Ibadan.

Procedure of the Research: Questionnaire seeking answers to various self-perceived oral health problems and oral care practices information will be administered to you. You will be expected to respond to each question according to what you know and do.

Duration: We will expect you to participate in this research for less than 30 minutes.

Risks: You may feel that some of the questions in the questionnaire probe your privacy, however, since no names or any other form of identifiers are required, your privacy is secure.

Costs: Your participation in this study will cost you no money.

Benefits: We believe that by relating the self-perceived oral health problems and the oral care practices employed by your population, it will be known in what areas intervention can be made by the responsible authorities to protect and improve your health.

Confidentiality: All information collected in this study will be given code numbers and no names will be recorded. This study will not be linked to you in anyway. As part of our responsibility to conduct this research properly, officials from NHREC and UI/UCH Ethics Committee may have access to these records.

Voluntariness: Your participation in this research is entirely voluntary.

Alternatives to participation: If you choose not to participate, this will not affect you in any way.

Due inducements: You will not be paid any fees for participating in this research.

Consequences of participant's decision to withdraw from the research and procedure for orderly termination of participation: You can also choose to withdraw from this research at any time. There will be no consequences.

Modality of providing treatments and actions to be taken in case of injury or adverse events: If you suffer any injury as a result of this research, you will be treated at the University College Hospital and the researcher will bear the cost of the treatment.

What happens to the research participants and community when the research is over? The researchers will inform you of the results of study through the internet or at the author's address given below, if you are interested.

Statement about sharing of benefits among researchers and whether this includes or excludes research participants: If this research leads to any improvements in interventions made by responsible authorities to protect and improve the health of this population, it will be open for everyone to benefit from according to stipulated requirements.

Any apparent or potential conflict of interest?

We are not aware of any reason why the researchers will not do their work judiciously.

Statement of person obtaining informed consent

I have fully explained this research to

and have given sufficient information, including about risks and benefits, to make an informed decision.

DATE.....SIGNATURE.....

NAME.....

Statement of person giving consent

I have read the description of the research or have it translated into a language I understand.

I have also talked it over with the doctor to my satisfaction. I understand that my participation is voluntary. I know enough about the purpose, methods, risks and benefits of the research study to judge that I want to take part in it. I understand that I may freely stop being part of the study at any time. I have received a copy of this consent form and additional information sheet to keep for myself

DATE.....SIGNATURE.....

NAME.....

Contact information

This research has been approved by the Health Research Ethics Committee of the University of Ibadan and the Chairman of this Committee can be contacted at Biode building, 2nd floor, Room T10, IMRAT, College of Medicine, U.I. E-mail : uiuchirc@yahoo.com

In addition, if you have questions about your participation in this research, you can contact the principal investigator: Dr Ikeobi Ada Esther, a Masters student of the Postgraduate School, University of Ibadan. E-mail dradaikeobi@yahoo.com

PLEASE KEEP A COPY OF THE SIGNED INFORMED CONSENT.

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**APPENDIX 3: COPY OF PARENTAL INFORMED CONSENT FORM
(English)**

PARENTAL INFORMED CONSENT FORM

IRB RESEARCH NUMBER...UI/EC/16/0231

THIS APPROVAL WILL ELAPSE ON...08/09/2017

Title: RELATIONSHIP BETWEEN SELF-PERCEIVED ORAL HEALTH PROBLEMS AND ORAL CARE PRACTICES AMONG SECONDARY SCHOOL STUDENTS IN IBADAN

Researchers: This study is being conducted by Dr Ikeobi Ada Esther, a Masters student of the Postgraduate School, University of Ibadan.

Sponsors: It is self-sponsored.

Purpose of the research: The purpose of this research is to find out the relationship between self-perceived oral health problems and oral care practices among secondary school students in Ibadan.

Procedure of the Research: Questionnaire seeking answers to various self-perceived oral health problems and oral care practices information will be administered to your child. Your child will be expected to respond to each question according to what he/she knows and does.

Duration: We will expect your child to participate in this research for less than 15 minutes.

Risks: Your child may feel that some of the questions in the questionnaire probe his/her privacy, however, since no names or any other form of identifiers are required, his/her privacy is secure.

Costs: Your child's participation in this study will cost him/her no money.

Benefits: We believe that by relating the self-perceived oral health problems and the oral care practices employed by your child's population, it will be known in what areas intervention can be made by the responsible authorities to protect and improve your child's health.

Confidentiality: All information collected in this study will be given code numbers and no names will be recorded. This study will not be linked to him/her in anyway. As part of our responsibility to conduct this research properly, officials from NHREC and UI/UCH Ethics Committee may have access to these records.

Voluntariness: Your child's participation in this research is entirely voluntary.

Alternatives to participation: If your child chooses not to participate, this will not affect him/her in any way.

Due inducements: Your child will not be paid any fees for participating in this research.

Consequences of participant's decision to withdraw from the research and procedure for orderly termination of participation: Your child can also choose to withdraw from this research at any time. There will be no consequences.

Modality of providing treatments and actions to be taken in case of injury or adverse events: If your child suffers any injury as a result of this research, he/she will be treated at the University College Hospital and the researcher will bear the cost of the treatment.

What happens to the research participants and community when the research is over? The researchers will inform you and your child of the results of study through the internet or at the author's address given below, if you are interested.

Statement about sharing of benefits among researchers and whether this includes or excludes research participants: If this research leads to any improvements in health care, it will be open for everyone to benefit from according to stipulated requirements.

Any apparent or potential conflict of interest? We are not aware of any reason why the researchers will not do their work judiciously.

Statement of person obtaining informed consent

I have fully explained this research to

and have given sufficient information, including about risks and benefits, to make an informed decision.

DATE.....SIGNATURE.....

NAME.....

Statement of person giving consent

I have read the description of the research or have it translated into a language I understand. I have also talked it over with the doctor to my satisfaction. I understand that my participation is voluntary. I know enough about the purpose, methods, risks and benefits of the research study to judge that I want my child to take part in it. I understand that he/she may freely stop being part of the study at any time. I have received a copy of this consent form and additional information sheet to keep for myself

DATE..... SIGNATURE.....

NAME.....

Contact information

This research has been approved by the Health Research Ethics Committee of the University of Ibadan and the Chairman of this Committee can be contacted at Biode building, 2nd floor, Room T10, IMRAT, College of Medicine, U.I. E-mail : uiuchirc@yahoo.com

In addition, if you have questions about your participation in this research, you can contact the principal investigator : Dr. Ikeobi Ada Esther, a Masters student of the Postgraduate School, University of Ibadan. E-mail dradaikeobi@yahoo.com

PLEASE KEEP A COPY OF THE SIGNED INFORMED CONSENT.

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**APPENDIX 4: COPY OF PARENTAL INFORMED CONSENT FORM
(Yoruba Translation)**

FOOMU FUNAWON OBI LATI LE SE IPINNU

NOMBA IWADI... I/EC/16/0231

IWE IFOWOSI YII YIO WA SI OPIN NI... 08/09/2017

AKORI: IBASEPO LAARIN OHUN TI AKIYESI FUN RA ENI ATI NIPA ISOR ILERA
ATI BI A SE UN SE ITOJU LAARIN AWON AKEEKO NI ILU IBADAN

Awadi: Iwadi yii ni a ti owo Dokita Ikeobi Ada Esther ti eka ede ti o wa fun eyin ati itoju
eyin agbegbe, ikose ogun, Fasiti ti Ibadan.

Olugbowo: O je eyi ti a gbowo eni se onigbowo re.

Eredi iwadi: Eredi iwadi yii ni lati le mo ibasepo to wa laarin ohun ti akiyesi fun ra eni ati
nipa isor ilera ati bi a se un se itoju laarin awon akeeko ni ilu Ibadan.

Ilana Iwadi: iwe ibeere yi yio ma beere fun idahun si awon ohun ti a kiyesi ti o je isoro ilera
ati awon alaye ti a ri gba nipa bi a se un se itoju ti a o fun omo yin. Omo yin ni yio wu wa
lati le dahun si awon ibeere kookan gegebi ohun ti o mo ati ti oun se.

Iye igba: A lero wipe ko ni gba omo yin ju iseju meedogun ninu iwadi yii.

Ewu: Omo yin lero wipe awon ibeere ti a ma beere yio wo ibi ikoko re, nibayi, niwon igbati
ko ni si oruko tabi awon nkan miran ti a le fi toka si, ibi ipamo won ni o ni idabobo to peye.

Ohun ti o ma na yin: Kikopa omo yin ninu iwadi yii ko ni na yin lowo rara.

Anfaani: A gbagbo wipe nipa siso fun wa nipa ailera ni nipa eyin ati ona ti e fi un gba toju
re ti omo yin un lo, ni a o mo ni awon ti a fe lo lati se ilaja lati odo awon alase lati le dabobo
ati mu idagbasoke ba ilera omo yin.

Mosinumosikun: Gbogbo alaye ti a gba jo lati owo yin ninu iwadi yii ni a o fun ni nomba
idanimo ati wipe ko ni si oruko ti a ma ko si lara. Iwadi yii ni a ko ni to pinpin re de odo

yin rara. Gegebi ise wa lati se iwadi yii daradara, awon abanisise lati NHREC ati UI/UCH ti won je igbimo ti o le ni anfaani si awon akosile wonyi.

Finufindo: Kiko ti omo yin fe kopa ninu iwadi yii ko pondandan rara.

Pinpinu lati ma kopa: Ti omo yin ba ko lati ma kopa ninu iwadi yii, ko ni ipa buburu Kankan fun ni onakona.

Omo ti e ma san: Omo yin ko ni san owo kankan fun kikopa ninu iwadi yii.

Ayorisi kiko ti akopa ko lati ma fe kopa ninu iwadi yii tabi ilana lati mu kikopa yin wa sopin: Omo yin le ko lati ma kopa ninu iwadi nigbakugba ti o ba wuyin. Ko si ewu kankan.

Ona lati pese itoju ilana lati to nigba ti ewu tabi ohunkohun ba sele.: ti omo yin ba un jiya nise ipalara Kankan nipase iwadi yii, a o se itoju re ni ile iwosan ikose oogun UCH ati wipe oluwadi ni yio san owo itoju.

Kinni ohun akopa ati agbegbe ti iwadi ba pari? Oluwadi yii yio so fun yin tabi omo yin nipa esi iwadi lati ori ero alatagba tabi adiresi olukopa tabi onkowe ti o wan i sale yii, ti o ba wu yin.

Oro nipa pinpin anfani laarin oluwadi ati wipe boya eyi ni I se pelu awon akopa. Ti iwadi yii ba mu atunse to ye si ilera, a o fi anfaani sile fun gbogbo eniyan lati je anfani re gegebi ohun ti a fe. Nje a ri ohunkohun ti o le dena si ohun ti a fe? A ko mo idi Kankan ti e le fi so fun wa idi ti awon oluwadi ti won ko fi ni se ise won gegbi o ti je.

Oro lati enu eni ti o un fi fohunsokan pelu eni

Mo salaye ni kikun ohun ti iwadi yii jemo.....

.....

Mo si tun se alaye ni kikun, nipa ewu ati anfaani ti o wa ki a to le se ipinnu.

OJO.....ITEWOBOWE.....

ORUKO.....

Oro lati enu eniti o fohunsokan

Mo ti kan apejuwe ohun ti iwadi yii dalori tabi mo ti yipada si ede ti o yemi. Mo si ti ba dokita mi soro wipe o temilorun lati kopa. Mo mo wipe kikopa mi ko pondandan. Mo mo daradara nipa idi, ilana ewu ati anfaani iwadi yii lati le ma wipe mo fe ki omo mi kopa ninu iwadi yii. Mo mo wipe o le mu iwadi yii wa sopin nigbakugba ti o ba wu mi. Mo ti gba eda foomu iwe ifohunsokan ati awon iwe alaye fun arami lati fi pamo

OJO.....ITEWOBOWE.....

ORUKO.....

Alaye bi e se le kan si wa

Iwadi yii ni a ti gba ase lati odo igbimo ti oun risi ilera ti Fasiti ti ilu Ibadan ati Adari igbimo yii ni a le kan sin i ile Biode, 2nd floor, Room T10, IMRAT, Kolegi ipogun, Fasiti ti ilu Ibadan. Atejise: uiuchirc@yahoo.com

Ni afikun, ti e ban i ibeere nipa kikopa yin ninu iwadi yii, e le kan si adari agba: Dokita: Dr Ikeobi Ada Esther. Atejise dradaikeobi@yahoo.com

JOWO TOJU EDA FOOMU IFOHUNSOKAN TI A TI FOWOSI.

APPENDIX 5: COPY OF LETTER OF ASSENT

LETTER OF ASSENT

I have had the description of this research explained to me thoroughly by the researcher in the presence of / with the aid of my teacher/ headmaster / principal.

The purpose, methods, risk and benefits have also been explained in such manner that I understand, and I am satisfied with the explanation.

I have been made to understand that my participation is voluntary, and I may choose to withdraw from the research at any time.

If at any time during the course of the study I need further explanation or clarification, I have been told that I can freely enquire from the researcher.

During the study, my teacher / headmaster / principal may also make enquiries or seek clarification on my behalf.

Hence, I willingly give assent to the researcher to proceed with the study.

DATE.....

NAME.....

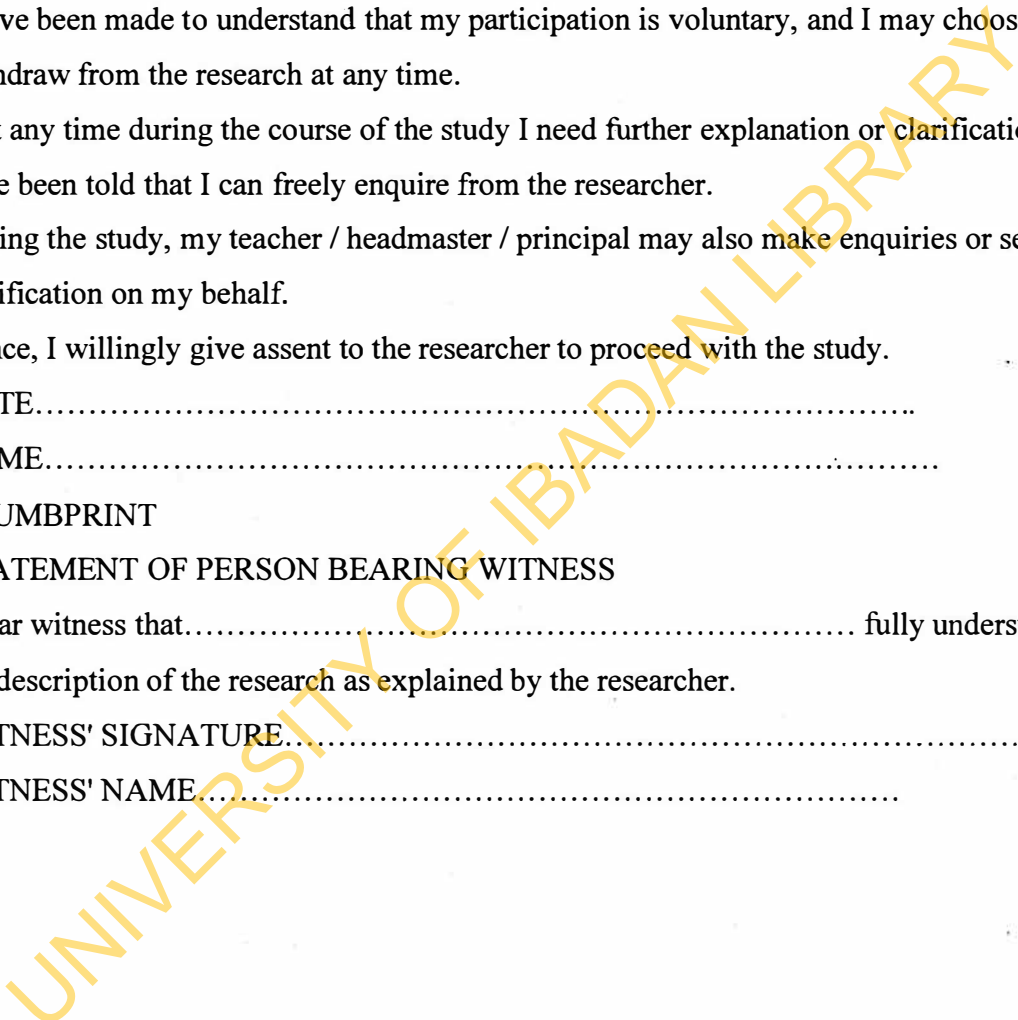
THUMBPRINT

STATEMENT OF PERSON BEARING WITNESS

I bear witness that..... fully understands the description of the research as explained by the researcher.

WITNESS' SIGNATURE.....

WITNESS' NAME.....





INSTITUTE FOR ADVANCED MEDICAL RESEARCH AND TRAINING (IAMRA)
College of Medicine, University of Ibadan, Ibadan, Nigeria.



Director **Prof. Catherine O. Falade**, MBS, PhD, MSc, FRCR, FRCR
 Tel: 0800 276 4593 | 0800 360 9151
 E-mail: cfalade@uoi.edu.ng | cfalade@uoi.ac.ng

UIUCH EC Registration Number: NHREC/05/01/2008a

NOTICE OF FULL APPROVAL AFTER FULL COMMITTEE REVIEW

Re: Relationship between Self-Perceived Oral Health Problems and Oral Care Practices among Secondary School Students in Ibadan

UIUCH Ethics Committee assigned number: ULEC/16/023

Name of Principal Investigator: **Dr. Ado E. Ikeobi**
 Address of Principal Investigator: Department of Periodontology & Community Dentistry,
 College of Medicine,
 University of Ibadan, Ibadan

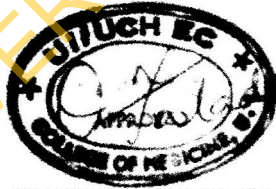
Date of receipt of valid application: 22/07/2016

Date of meeting when final determination on ethical approval was made: N/A

This is to inform you that the research described in the submitted protocol, the consent forms, and other participant information materials have been reviewed and given full approval by the UIUCH Ethics Committee.

This approval dates from **09/09/2016** to **08/09/2017**. If there is delay in starting the research, please inform the UIUCH Ethics Committee so that the dates of approval can be adjusted accordingly. Note that no participant accrual or activity related to this research may be conducted outside of these dates. *All informed consent forms used in this study must carry the UIUCH EC assigned number and duration of UIUCH EC approval of the study.* It is expected that you submit your annual report as well as an annual request for the project renewal to the UIUCH EC at least four weeks before the expiration of this approval in order to avoid disruption of your research.

The National Code for Health Research Ethics requires you to comply with all institutional guidelines, rules and regulations and with the tenets of the Code including ensuring that all adverse events are reported promptly to the UIUCH EC. No changes are permitted in the research without prior approval by the UIUCH EC, except in circumstances outlined in the Code. The UIUCH EC reserves the right to conduct compliance visit to your research site without previous notification.



Professor Catherine O. Falade
 Director, IAMRA
 Chairperson, UIUCH Ethics Committee
 E-mail: ucf@uoi.ac.ng

APPENDIX 7: COPY OF PERMISSION FROM MINISTRY OF EDUCATION

PRIVATE MAIL BAG NO 5004

MINISTRY OF



EDUCATION

Schools

DEPARTMENT

IBADAN OYO STATE OF NIGERIA

EDU. 215/T1/52


July, 11

Dr. (Miss) Ikeobi A.E,
Department of Periodontology & Community Dentistry,
University College Hospital,
Ibadan,
Oyo State,
Nigeria.

RE: PERMISSION FOR RESEARCH

I am directed to acknowledge the receipt of your letter dated 12th July, 2011 in respect of the above subject and convey the approval of the Honourable Commissioner for Education to you.

2. You are to please liaise with the School Principal to work out the modalities for implementation.
3. I am to add that, a copy of the completed research work should be submitted to the Ministry.
4. Thank you.


Oyinloye B.T (Mrs.)

Honourable Commissioner for Education