ORAL HEALTH KNOWLEDGE, ATTITUDE AND PRACTICE AMONG
FIRST AND FOURTH YEAR DENTAL STUDENTS AT THE UNIVERSITY OF
NAIROBI

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V28/1948/2010
BDS LEVEL 3

COMMUNITY DENTISTRY RESEARCH PROJECT REPORT SUBMITTED IN PARTIAL
FULFILMENT OF REQUIREMENTS FOR THE AWARD OF BACHELOR OF DENTAL
SURGERY DEGREE OF THE UNIVERSITY OF NAIROBI

2013
DECLARATION

I, Ngure Sheila Wanjiku, declare that this is my original work, and that it has never been submitted by any other person for research purpose, degree or otherwise in any other university or college.

Signedé é é é é é é é é ..é é ..                     Dateé é é é é é é é é é é é é é é é é ..
**APPROVAL**

I, Ngure Sheila Wanjiku, submit this report to the University of Nairobi Dental School for examination with the approval of the Kenyatta National Hospital Research Ethics and Standards Committee.

Signed é é é é é é é é é é é é é é é é é é é é é é é . Date é é é é é é é é é é é é é é é é é é é é é é é é .

This research report is submitted with the approval of my supervisors.

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School of Dental Sciences,

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**External supervisor:**

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College of Health Sciences, UoN

Signed é é é é é é é é é é é é é é é é é é é é é é é . Date é é é é é é é é é é é é é é é é é é é é é é é é é é .
DEDICATION
I dedicate this project to my brother, Ngure M Gideon; Njenga V. W, and my supervisors for all the help and support they have given me.
ACKNOWLEDGEMENTS

I wish to thank the following persons for their generous support and assistance in making this project a success:

First I thank the Lord God Almighty for guiding me through this year and the research work.

Secondly, I thank my brother for the financial and moral support which gave me the strength to accomplish this project.

I also thank my supervisors, Dr. B. N. Mua and Dr. E. Dimba for the information, wise guidance and encouragement throughout the period of my research.

I also express my gratitude to Njenga V. W. and all those who may have directly or indirectly contributed to the success of my research work.
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<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>BDS</td>
<td>Bachelor of Dental Surgery</td>
</tr>
<tr>
<td>DMFT score</td>
<td>Decayed Missing Filled Teeth score</td>
</tr>
<tr>
<td>KNH</td>
<td>Kenyatta National Hospital</td>
</tr>
<tr>
<td>SPSS</td>
<td>Statistical Package for Social Sciences</td>
</tr>
<tr>
<td>UON</td>
<td>University of Nairobi</td>
</tr>
<tr>
<td>UON DS</td>
<td>University of Nairobi Dental School</td>
</tr>
<tr>
<td>WHO</td>
<td>World Health Organization</td>
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</table>
ABSTRACT

Background: The behavior of oral health care providers and their attitudes towards their own oral health reflect not only their understanding of the importance of preventive dental procedures but also helps in improving the oral health of their patients. Various cases or reported dental pathologies at an advanced stage among dental students at the UON DS contradict the expectation of optimal oral health amongst them. Research was therefore needed to determine the effectiveness of lectures given on oral health and oral hygiene on the dental students’ personal oral health.

Objective: To evaluate the attitudes and practices of first and fourth year dental students concerning their oral health and to compare oral health knowledge between pre-clinical students (first years) and clinical students (fourth years).

Study design: This was a descriptive cross-sectional study.

Methodology: Stratified random sampling was used to select a sample of 66 undergraduate dental students in their first and fourth years of school. The study was conducted at University of Nairobi Dental School and Chiromo campus. Self-administered questionnaires with open-ended and close-ended questions were used to collect data on knowledge, attitude and practice on oral health among first and fourth year undergraduate dental students. The results were analyzed using SPSS version 16.0 and Microsoft Office Excel 2007.

Perceived benefits: The study results may be used to acquire baseline information on oral health knowledge, attitude and practice among dental students at the University of Nairobi Dental School and to assess the effectiveness of the lectures given to students concerning oral health.

Data analysis: The information was coded in a computer. Data analysis was computer aided by use if SPSS version 16.0 with concurrent use of Microsoft Office Excel 2007. The data was computed in terms of percentages, means and presented in the form of graphs and tables.

Results: A total of 66 first and fourth year dental students were included in the study. All of them stated the importance of dental check-ups but 37.9% had never had a dental check-up done.
Female students generally had better oral hygiene practices, better oral health-seeking habits, less parafunctional habits and less drug and substance abuse except for binge drinking (heavy episodic drinking). Fourth year students generally had better oral hygiene practices, better oral health-seeking habits and less parafunctional habits but a higher incidence of regular alcohol intake, binge drinking, and cannabis use. First year students had a higher incidence of tobacco smoking.

**Conclusion:** Some of the students (37.9%) had a negative attitude toward their oral health. This is seen more in male (58.1%) students and first year students (25.7%). There was also a discrepancy between their oral health knowledge and oral health practice.

**Recommendation:** A comprehensive study into the gender difference in oral health attitude and practice should be done and an introduction of subjects that are relevant to oral health practice (like Periodontology) ought to be introduced earlier in the curriculum (in the preclinical years).
CHAPTER ONE: INTRODUCTION AND LITERATURE REVIEW

1.1 INTRODUCTION

Oral health is a state of being free from mouth and facial pain or discomfort and conditions that limit an individual’s capacity in speaking, chewing, biting, smiling and psychosocial well-being. These conditions include oral and throat cancer, oral infections and sores, periodontal disease, tooth decay, tooth loss among other diseases. Good oral health is essential to everyone’s general health and impacts directly on their quality of life. The behavior of oral healthcare providers and their attitudes to their own oral health reflect not only their understanding of the importance of preventive dental procedures but also helps in improving the oral health of their patients. Some of the factors that contribute to poor oral health include unhealthy diet, cigarette smoking, and Parafuncional habits like nail biting and thumb sucking.

Diet and nutrition play an important role in the incidence and progression of oral disease. An increase in the frequency of sugar consumption between meals has been associated with increased caries incidence as evidenced by the Vipeholm study in Sweden (1945-1953). Dental caries is a bacterial disease of the calcified tissues of the teeth characterized by demineralization of the inorganic and destruction of the organic substance of the tooth. It is the most prevalent dental disease.

Tobacco use has been associated with oral lesions like leukoplakia which is pre-cancerous. There is an etiological relationship between smoking of tobacco and oral carcinoma regardless of the type of tobacco and method of consumption. Cigarette smoking aggravates periodontal disease by worsening the oral hygiene status and shifting the balance of the bacteria in the mouth towards harmful disease causing bacteria. It also impairs the effectiveness of periodontal treatment and has been associated with oral lesions like nicotine stomatitis.

Alcohol has also been associated with oral carcinomas. Pure ethanol has not been shown to be carcinogenic and it is thought that other chemicals in the beverage, called congeners, are responsible for the increased cancer risk.
Oral hygiene is key in maintaining good oral health. Poor oral hygiene leads to plaque build-up that predisposes one to gingivitis and periodontitis\textsuperscript{17}. Halitosis, which greatly impacts someone’s social interaction, also results from poor oral hygiene.

Para functional habits lead to development of malocclusions that may be aesthetically unpleasant. Oral parafunctional habits include bruxism, nail biting, pen biting, gum chewing, bottle opening using teeth, thumb sucking and lip/cheek biting. Temporomandibular disorders have been found to be more prevalent in the presence of bruxism than in other oral para functions\textsuperscript{14}.

The behavior of dental students as oral health care providers and their attitudes towards their own oral health reflect their understanding of the importance of oral and dental healthcare as a preventive measure towards a variety of dental diseases. They are expected to be a good example for oral health behaviour\textsuperscript{2} because they advice the community around them on how to maintain good oral and dental health.

Since the dental students at the University of Nairobi in their fourth year of study are essentially oral health educators, there is need to determine the status of their own oral health, their knowledge on matters oral health and their attitudes towards measures taken to improve and maintain oral health. This study aims at determining the oral health knowledge, attitude and practice of dental students in their clinical years of school as compared to those in their preclinical years of study at the University of Nairobi. The findings of this study may therefore be used to assess the efficacy of lectures given to dental students.
1.2 LITERATURE REVIEW

Oral health is an integral part of an individual's general health and quality of life. There are many factors that influence one's oral health. These include oral para function, oral hygiene, drug and substance abuse and diet among others. These are some of the things that are targeted in the prevention of diseases and conditions in the oral cavity. Frequent dental check-ups are essential in preventing progression of oral diseases and conditions.

1.2.1 DENTAL CHECK UP

These are important in ensuring good oral health. However, the time period between recommended dental visits varies between individuals. In Britain, 6 months is customary between dental check-ups. Al Omari Q et al reported that 50% of the dental students in a Jordanian study stated that tooth ache was the main reason for a dental visit. A study done on students from the university of Nairobi, college of health sciences found that dental students had the highest frequency of regular dental visits (45%) majority of which (21%) were for dental checkups. The reasons for not visiting the dentist regularly included fear of painful treatment (26.4%), long waiting time in the dental clinic (13.6%) and costly treatment (12.7%) among others.

1.2.2 ORAL PARAFUNCTION

Oral para functional habits include nail biting, pen biting, lip/cheek biting, bottle opening using teeth, gum chewing, thumb sucking and overuse of pacifiers. These may over time cause various forms of malocclusion and disorders of the temporomandibular joint. Frequent myofacial symptoms had a prevalence of 19% in a study done on dental students over a one year period with an incidence of 4% with female students presenting the almost fourfold incidence rate. Male students were predominantly non-symptomatic and unaware of bruxism.

1.2.3 DIET AND NUTRITION

Diet and nutrition play an important role in the incidence and progression of oral disease. A study done on the relationship among eating habits, lifestyle and oral health status of dental hygiene students in Tokyo reported that almost half of the students studied did not eat one of the three main meals, mostly breakfast. They had higher DMFT scores compared to those who did not skip meals. Students who ate processed foods like noodles for breakfast also had higher DMFT scores.
1.2.4 DRUG AND SUBSTANCE ABUSE

Drug and substance abuse is rampant among university students. The drugs abused by students at the University of Nairobi include cigarettes, alcohol, bhang and khat. Oral health of alcoholics and substance abusers is often neglected.

1.2.4.1 Khat

Khat is a psycho stimulant from the Catha edulis plant that grows mainly in Yemen, Ethiopia, Somali, Kenya, Saudi Arabia, high altitude areas of South Africa and Madagascar. It is commonly known as "miraa" in Kenya. Those that chew khat commonly claim that it gives increased energy levels, alertness and confidence, a sense of happiness, better thinking capacity and creativity among others\(^5\). A Yemeni study showed that khat chewers tend to have poorer oral hygiene, an increased incidence of gingival bleeding and increased incidence of a burning sensation in the oral soft tissues as compared to non-khat chewers. There therefore seems to be a relationship between chewing of khat and periodontal tissue and oral hygiene status\(^5\).

1.2.4.2 Cigarette smoking

Smoking leads to dental problems including bad breath, tooth discoloration, inflammation of salivary gland openings on the roof of the mouth, increased build up of plaque and calculus on the teeth, increased bone loss within the jaw, increased risk of leukoplakia, white patches inside the mouth, increased risk of developing gingivitis, delayed healing process following tooth extraction, periodontal treatment or oral surgery, lower success rate following dental implant procedures and increased risk of developing oral cancer\(^17\). Tobacco smoking was reported by 27% of males and 13.5% of females in a study done on dental undergraduate students at an English university in 2008 in comparison to only 12.8% of the respondents in a study done among dental students in Tanzania, all being male and was more common in students in clinical years than pre-clinical\(^10\).

1.2.4.3 Alcohol

Apart from dental erosion due to the acidity of alcoholic drinks, chronic alcohol consumption is a risk factor for various oral mucosal lesions. In addition to that, most alcoholics are not really concerned with their oral hygiene which predisposes them to dental caries and periodontitis among other dental diseases\(^6\). This leads to poor oral health in general and deterioration of existing oral conditions.
63% of male and 69.5% of female English students reported drinking alcohol. Binge drinking (heavy episodic drinking) was reported by 69.5% of males and 66% of females. In a Tanzanian study, alcohol use during the last 30 days was reported by 23.8% and binge drinking during the last two weeks by 11.8% and was more common in students in clinical years than pre-clinical.

1.2.4.4 Bhang
Bhang is the common name given to the drug *Cannabis sativa*. It is most commonly smoked but can also be added to foods. Cannabis abusers generally have poorer oral health with an increased risk of dental caries and periodontal diseases. Also, cannabis smoke acts as a carcinogen and is associated with dysplastic changes and pre-malignant lesions within the oral mucosa. 38% of male and 32% of female dental students in an English study was found to have ever used cannabis.

1.2.5 ORAL HYGIENE
Most dental diseases and conditions are due to accumulation of bacterial plaque. A study done on first year dental students in the University of Sharjah showed that 56% of them used dental floss regularly and 86% brushed twice daily or more. Male students had higher bleeding and plaque scores than female students. This was attributed to the fact that females tend to be more concerned about their oral health status.

This study aimed at determining the knowledge, attitudes and practices on oral health amongst 1st and 4th year undergraduate dental students at the University of Nairobi because they act as an important link to the community on how to achieve and maintain oral health. The study results may therefore be used to acquire baseline information on oral health knowledge, attitude and practice among 1st and 4th year dental students at the University of Nairobi Dental School and to assess the effectiveness of the lectures given to dental students concerning oral health.
CHAPTER TWO: PROBLEM STATEMENT, JUSTIFICATION AND OBJECTIVES

2.1 PROBLEM STATEMENT

Knowledge, attitude and practices on oral health play an integral part in the overall well being of an individual. This is especially important concerning dental students because they act as an important link to the community on how to achieve and maintain oral health. Various cases of reported dental pathology at an advanced stage contradict the expectation of optimal oral health amongst them.

2.2 JUSTIFICATION OF STUDY

Various cases of reported dental pathology at an advanced stage among dental students at the UON DS contradict the expectation of optimal oral health amongst them. Research was therefore needed to determine the effectiveness of lectures on oral health and oral hygiene on the dental students’ personal oral health. This study aimed at investigating this and the data obtained may be used to assess the effectiveness of the education given to the students in class on their own oral healthcare. This also helps the students integrate more of what they are taught in class and use it for their own benefits as well.
2.3 OBJECTIVES OF THE STUDY

2.3.1 GENERAL OBJECTIVE:
To evaluate the attitudes and practices of first and fourth year dental students concerning their oral health and to compare oral health knowledge between pre-clinical students (first years) and clinical students (fourth years).

2.3.2 SPECIFIC OBJECTIVES:
   i. To assess the level of knowledge of oral health amongst first and fourth year dental students.
   ii. To determine the attitude of first and fourth year dental students towards their oral health.
   iii. To determine the measures taken to improve and maintain oral health status amongst first and fourth year dental students.
CHAPTER THREE: MATERIALS AND STUDY METHODS

3.1 STUDY AREA
This study was conducted in UoN Dental Hospital and UoN Chiromo campus. The University of Nairobi Dental Hospital is a teaching hospital located in Nairobi, the capital city of Kenya, opposite Lee Funeral Home along Argwings Kodhek road and next to China Plate restaurant along Valley road. It is the largest dental teaching hospital in Kenya. It provides treatment of all dental conditions with many highly qualified teaching staff. Undergraduate dental students in their fourth year of school were studied here.

Undergraduate first year dental students were studied at Chiromo campus of the University of Nairobi. It is located next to Chiromo mortuary along Waiyaki way.

3.2 STUDY DESIGN
This was a descriptive cross-sectional study.

3.3 STUDY POPULATION
Undergraduate dental students in their first and fourth years of study.

3.3.1 Inclusion criteria
i. First and fourth year undergraduate dental students at UON DS
ii. Those who will have consented to the study.

3.3.2 Exclusion criteria
i. Any student at UON DS who is not a first and fourth year undergraduate dental student.
ii. Those who will not have consented to the study.

3.4 VARIABLES

3.4.1 Sociodemographic variables
- Age
- Gender
- Year of study
3.4.2 Independent variables

- Attitude towards oral health

3.4.3 Dependent variables

- Reason for seeking treatment.
- Reason for not seeking treatment.
- Reason for delay in seeking treatment.

3.5 SAMPLE DESIGN AND PROCEDURE

\[ N = Z^2 P(1-P) \frac{C^2}{2} \]

Where \( N \) = sample size
\( Z \) = degree of accuracy (1.96)
\( P \) = prevalence (50%)
\( C \) = 100-Confidence interval (0.95)

\[ N = (1.96)^2 0.5(1-0.5) \]

\( (1-0.95)^2 \)

\[ N = 384 \]

If \( N \) is less than 10,000
\( N_f = n \)
\( 1 + (n/N) \)

Where \( n \) is the desired population size
\( n \) is 384

\( N \) is an estimate of the population size which is 80

\( N_f = 384 \)

\( 1 + (384/80) \)

\[ N_f = 66.207 \]

Therefore the minimum sample size was 66 students.
3.6 DATA COLLECTION
Self-administered questionnaires were used to collect data on knowledge, attitudes and practice on oral health among 1st and 4th year undergraduate dental students in UON DS. The questionnaires contained both open-ended and close-ended questions.

3.7 DATA ANALYSIS AND PRESENTATION
Data was analyzed using SPSS Version 16.0 with the concurrent use of Microsoft Excel 2007. The measures computed include means and percentages. The results obtained were presented as bar charts and tables.

3.8 MINIMISING BIAS AND ERRORS
Questionnaires were pretested to ensure reliability of data collected.

Simple enough language was used in the questionnaires.

3.9 ETHICAL CONSIDERATIONS
Approval was sought from the KNH-UON Ethics, Research and Standards committee based at KNH. Informed consent was acquired from the individuals. Participation after informed consent by the respondents was voluntary and their confidentiality was guaranteed. The findings of this project will be used for the betterment of the study population targeted.

3.10 PERCEIVED BENEFITS
The study results may be used to acquire baseline information on oral health knowledge, attitude and practice among undergraduate dental students at the university of Nairobi dental school. This research project is in partial fulfillment for the award of a degree in bachelor of dental surgery from the University of Nairobi.
CHAPTER FOUR: RESULTS

4.1 SOCIODEMOGRAPHIC CHARACTERISTICS
A total of 66 undergraduate dental students were studied, 36 being female (54.5%) and 30 being male students (45.5%). 35 of the students were in 1st year of school (53.0%) and 31 were in their 4th year of school (47.0%). The females were slightly older (mean 21.39) than males (mean 20.90).

Figure 1. Age and Gender distribution.
Fourth year students were slightly older (mean 22.87 years) than first year students (mean 19.66 years).

Figure 2. Age and Year of study distribution.

There were slightly more male students in first year than in 4th year and slightly more female students in 4th year than in 1st year.

Figure 3. Gender and year of study distribution.
4.2 ORAL HEALTH KNOWLEDGE

4.2.1 Knowledge on preventive measures to maintain oral health

All 66 students (100%) stated the importance of regular dental checkups in maintaining optimal oral health. 60 (90.9%) termed oral parafunction as potentially harmful habits involving the oral structures while 6 (9.1%) were not sure what it was. 62 (93.9%) affirmed that diet and nutrition does play an important role in an individual’s oral health state; 4 (6.1%) did not agree. 60(90.9%) were aware of harmful effects of drug and substance abuse on oral health while 6 (9.1%) were not.

Figure 4: Assessment of oral health knowledge.
4.2.2 Knowledge on oral hygiene practice

Concerning how often one should change their toothbrush; 2 (3.0%) stated 1 month, 16 (24.2%) stated 2 months, 40 (60.6%) stated 3 months and 8 (12.1%) did not know. On the ideal toothbrush bristles, 9 (13.6%) chose hard bristles, 53 (80.3%) chose soft bristles, 3 (4.5%) did not know and 1 (1.5%) did not respond. 55 (83.3%) termed soft bristles to be ideal to avoid injury to the gums, 3 (4.5%) stated that hard bristles adequately remove plaque, 7 (10.6%) chose medium bristles because they were dental students and 1 (1.52%) stated medium bristles are ideal for adequate plaque removal yet still avoid trauma to the gingiva.

Fig. 5: Assessment of oral hygiene knowledge.
Table 1 shows the gender distribution of the responses concerning knowledge on proper oral health practices. Slightly more male (93.33%) than female (88.88%) students had a clear understanding of what oral parafunctional habits were and their effects on one’s oral health; and the harmful effects of drug and substance abuse on oral health.

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>MALE</th>
<th>FEMALE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>Importance of regular dental check up</td>
<td>30  (100%)</td>
<td>0  (0%)</td>
</tr>
<tr>
<td>Understanding of what oral parafunction is</td>
<td>28  (93.33%)</td>
<td>2  (6.67%)</td>
</tr>
<tr>
<td>Frequency and type of diet affects oral health</td>
<td>28  (93.33%)</td>
<td>2  (6.67%)</td>
</tr>
<tr>
<td>Drug and substance abuse affects oral health</td>
<td>28  (93.33%)</td>
<td>2  (6.67%)</td>
</tr>
</tbody>
</table>

Table: Gender distribution of oral health knowledge.

Table 2 shows the gender distribution of knowledge on oral hygiene practices. More female (66.6%) than male (53.3%) students stated 3 months to be the ideal period at which one should change their toothbrush. Soft bristled toothbrushes were also preferred among female students (88.5%) more than among male students (73.3%).

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>RESPONSE</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>female</td>
</tr>
<tr>
<td></td>
<td></td>
<td>36</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>after how long they should change their toothbrush</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 month</td>
<td>1 (2.7%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 months</td>
<td>8 (22.2%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 months</td>
<td>24 (66.6%)</td>
</tr>
<tr>
<td></td>
<td>don't know</td>
<td>3 (8.3%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>what type of toothbrush is recommended</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hard</td>
<td>3 (8.5%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Soft</td>
<td>31 (88.5%)</td>
</tr>
<tr>
<td></td>
<td>don't know</td>
<td>1 (2.8%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>reason for type of toothbrush</td>
<td></td>
</tr>
<tr>
<td></td>
<td>soft bristles to avoid injuring the gum</td>
<td>31 (81.6%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>hard bristles to adequately remove plaque</td>
<td>1 (2.7%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>I'm a dental student</td>
<td>3 (10.0%)</td>
</tr>
<tr>
<td></td>
<td>medium hardness to adequately remove plaque yet not injure the gum</td>
<td>1 (2.7%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>36</td>
</tr>
</tbody>
</table>

Table 2: Gender distribution of assessment of oral hygiene knowledge
Table 3 shows the distribution of the responses concerning knowledge on proper oral health practices among first and fourth year dental students. Slightly more fourth years (100.0%) than first years (82.8%) students had a clear understanding of what oral parafunctional habits were and their effects on one’s oral health. Slightly more first years (94.2%) than fourth years (87.1%) stated the harmful effects of drug and substance abuse on oral health.

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>FIRST YEAR STUDENTS</th>
<th>FOURTH YEAR STUDENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Are regular dental checkups important?</td>
<td>YES 35 (100.0%)</td>
<td>NO 0 (0.0%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>YES 30 (100.0%)</td>
</tr>
<tr>
<td>Understanding of what oral parafunction is</td>
<td>YES 29 (82.8%)</td>
<td>NO 6 (17.1%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>YES 31 (100.0%)</td>
</tr>
<tr>
<td>Frequency and type of diet affects oral health</td>
<td>YES 33 (94.2%)</td>
<td>NO 2 (5.7%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>YES 29(93.5%)</td>
</tr>
<tr>
<td>Drug and substance abuse affects oral health</td>
<td>YES 33 (94.2%)</td>
<td>NO 2 (5.7%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>YES 27(87.1%)</td>
</tr>
</tbody>
</table>

Table 3: Oral health knowledge and level of education.

Table 4 shows the distribution of knowledge on oral hygiene practices among first and fourth year dental students. Almost the same number of first year (60.0%) and fourth year (61.2%) students stated 3 months to be the ideal period at which one should change their toothbrush. Soft bristled toothbrushes were more preferred among fourth year students (86.6%) than among first year students(77.1%).
<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>RESPONSE</th>
<th>GENDER OF PARTICIPANT</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>First years</td>
<td>Fourth years</td>
</tr>
<tr>
<td>after how long they should change their toothbrush</td>
<td>1 month</td>
<td>2 (5.7%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td></td>
<td>2 months</td>
<td>6 (17.1%)</td>
<td>10 (32.2%)</td>
</tr>
<tr>
<td></td>
<td>3 months</td>
<td>21 (60.0%)</td>
<td>19 (61.2%)</td>
</tr>
<tr>
<td></td>
<td>don't know</td>
<td>6 (17.1%)</td>
<td>2 (6.4%)</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>35</td>
<td>31</td>
</tr>
<tr>
<td>what type of toothbrush is recommended</td>
<td>Hard</td>
<td>5 (14.2%)</td>
<td>4 (13.3%)</td>
</tr>
<tr>
<td></td>
<td>Soft</td>
<td>27 (77.1%)</td>
<td>26 (86.6%)</td>
</tr>
<tr>
<td></td>
<td>don't know</td>
<td>3 (8.5%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>35</td>
<td>30</td>
</tr>
<tr>
<td>reason for type of toothbrush</td>
<td>soft bristles to avoid injuring the gum</td>
<td>32 (91.4%)</td>
<td>23 (74.1%)</td>
</tr>
<tr>
<td></td>
<td>hard bristles to adequately remove plaque</td>
<td>1 (2.8%)</td>
<td>2 (6.4%)</td>
</tr>
<tr>
<td></td>
<td>I'm a dental student</td>
<td>2 (5.7%)</td>
<td>5 (16.6%)</td>
</tr>
<tr>
<td></td>
<td>medium hardness to adequately remove plaque yet not injure the gum</td>
<td>0 (0.0%)</td>
<td>1 (3.2%)</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>35</td>
<td>31</td>
</tr>
</tbody>
</table>

Table 4: Oral hygiene and level of education.
4.3 ORAL HEALTH ATTITUDES
4.3.1 Frequency of dental visits

25 students (37.9%) had ever been to a dentist; 11 males and 14 females. 40 had never been to a dentist; 18 males and 22 females. 1 student (1.5%) did not respond. Of those who had been to a dentist, 9 were in first year and 16 in fourth year. Of those who had never been treated by a dentist, 26 were first years and 14 fourth years. This is shown in figures 6 and 7.

![Figure 6: Gender distribution of previous dental treatment.](image)

![Figure 7: Level of education distribution of previous dental treatment.](image)
4.3.2 Reasons for not seeking dental treatment

Of those who had never been to a dentist before, 9 (22%) quoted high treatment cost as the main reason; 6 being female and 3 male; 4 first years and 5 fourth years. 26 (63.4%) said there is no pain to make them go see a dentist; 14 females and 12 males; 18 first years and 8 fourth years. 6(14.6%) did not like people working in their mouths; 3 females and 3 males; 4 first years and 2 fourth years. This is shown in figures 8 and 9.

Figure 8: Reasons for not visiting a dentist.

Figure 9: Level of education distribution of reasons for not visiting a dentist.
4.4 ORAL HEALTH PRACTICE

4.4.1 Dental check up

25(37.87%) students reported having seen a dentist for checkups at varying frequencies; females (14) being slightly more than males (11).

<table>
<thead>
<tr>
<th>FREQUENCY</th>
<th>GENDER</th>
<th>LEVEL OF STUDY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Females</td>
<td>males</td>
</tr>
<tr>
<td>6-12 months</td>
<td>1 (7.14%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>occasionally</td>
<td>6 (42.8%)</td>
<td>5 (45.4%)</td>
</tr>
<tr>
<td>Incase of dental</td>
<td>7 (50.0%)</td>
<td>6 (54.5%)</td>
</tr>
<tr>
<td>pain</td>
<td>total</td>
<td>14 (56.0%)</td>
</tr>
</tbody>
</table>

Table 5: Gender distribution of frequency of dental check-up.

4.4.2 Oral parafunctional habits

The oral habits assessed include thumb sucking, nail biting, opening soda bottles using teeth, lip biting, bruxism and others. The most common current oral parafunctional habit was pen biting (12.1%)
Slightly more male students (13.3%) than female students (8.33%) currently habitually bite their nails and open soda bottles with their teeth. Bruxism was also more common among male students (16.6%)

<table>
<thead>
<tr>
<th>HABIT</th>
<th>NEVER female</th>
<th>NEVER Male</th>
<th>USED TO BUT STOPPED female</th>
<th>USED TO BUT STOPPED Male</th>
<th>CURRENTLY female</th>
<th>CURRENTLY Male</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thumb sucking</td>
<td>24(66.6%)</td>
<td>25(83.3%)</td>
<td>12(33.3%)</td>
<td>5(16.6%)</td>
<td>0(0.0%)</td>
<td>0(0.0%)</td>
</tr>
<tr>
<td>Lip biting</td>
<td>28(77.7%)</td>
<td>24(80%)</td>
<td>6(16.6%)</td>
<td>3(10.0%)</td>
<td>2(5.5%)</td>
<td>3(10.0%)</td>
</tr>
<tr>
<td>Nail biting</td>
<td>23(63.8%)</td>
<td>15(50.0%)</td>
<td>10(27.7%)</td>
<td>11(36.6%)</td>
<td>3(8.33%)</td>
<td>4(13.3%)</td>
</tr>
<tr>
<td>Opening soda bottles using teeth</td>
<td>28(77.7%)</td>
<td>21(70.0%)</td>
<td>5(13.8%)</td>
<td>5(16.6%)</td>
<td>3(8.33%)</td>
<td>4(13.3%)</td>
</tr>
<tr>
<td>Bruxism</td>
<td>28(77.7%)</td>
<td>20(66.6%)</td>
<td>5(13.8%)</td>
<td>5(16.6%)</td>
<td>2(5.5%)</td>
<td>5(16.6%)</td>
</tr>
<tr>
<td>Pen biting</td>
<td>23(63.8%)</td>
<td>17(56.6%)</td>
<td>10(27.7%)</td>
<td>8(26.6%)</td>
<td>3(8.3%)</td>
<td>5(16.6%)</td>
</tr>
<tr>
<td>Others</td>
<td>36(100.0%)</td>
<td>26(86.6%)</td>
<td>0(0.0%)</td>
<td>1(3.3%)</td>
<td>0(0.0%)</td>
<td>2(6.6%)</td>
</tr>
</tbody>
</table>

Table 6: Gender distribution of oral parafunctional habits
Table 7 shows the distribution of oral parafunctional habits among first and fourth year dental students. None of the students reported current thumb sucking. Lip biting, nail biting, bruxism, pen biting and opening soda bottles using teeth were more common among first year students.

<table>
<thead>
<tr>
<th>HABIT</th>
<th>NEVER</th>
<th>USED TO BUT STOPPED</th>
<th>CURRENTLY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>FIRST YEAR</td>
<td>FOURTH YEAR</td>
<td>FIRST YEAR</td>
</tr>
<tr>
<td>Thumb sucking</td>
<td>27(77.1%)</td>
<td>22(70.9%)</td>
<td>8(22.8%)</td>
</tr>
<tr>
<td>Lip biting</td>
<td>29(82.8%)</td>
<td>23(74.1%)</td>
<td>2(5.7%)</td>
</tr>
<tr>
<td>Nail biting</td>
<td>25(71.4%)</td>
<td>13(41.9%)</td>
<td>6(17.1%)</td>
</tr>
<tr>
<td>Opening soda bottles using teeth</td>
<td>26(74.2%)</td>
<td>23(74.1%)</td>
<td>4(11.4%)</td>
</tr>
<tr>
<td>Bruxism</td>
<td>25(71.4%)</td>
<td>25(80.6%)</td>
<td>6(17.1%)</td>
</tr>
<tr>
<td>Pen biting</td>
<td>23(65.7%)</td>
<td>17(54.8%)</td>
<td>1(2.8%)</td>
</tr>
<tr>
<td>Others</td>
<td>33(94.2%)</td>
<td>29(93.5%)</td>
<td>1(2.8%)</td>
</tr>
</tbody>
</table>

Table 7: Level of undergraduate study distribution of oral parafunction

4.4.3 Drug and substance use

42 (63.6%) students reported never having smoked cigarettes, 14 (21.2%) used to smoke but stopped and 10 (15.2%) currently smoke. 57 (86.4%) students do not regularly take alcohol, 2 (3.0%) used to but stopped and 7 (10.6%) still do. 39 (59.1%) students have never participated in binge drinking, 9 (13.6%) used to but stopped and 18 (27.3%) currently go binge drinking. 59 (89.4%) had never used khat and the rest; 7 (10.6%) used to but stopped. 51 (77.3%) had never used bhang, 10 (15.2%) used to but stopped and 5 (7.6%) currently use bhang.
Figure 11: Distribution of drug/substance abuse.

More first year students (22.8%) were current smokers than fourth year students (6.4%). None of the students reported current khat chewing. Slightly more fourth year students reported current regular alcohol intake, binge drinking and bhang use.

<table>
<thead>
<tr>
<th>DRUG/SUBSTANCE</th>
<th>NEVER USED</th>
<th>STOPPED USING</th>
<th>CURRENTLY USING</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>FIRST YEARS</td>
<td>FOURTH YEARS</td>
<td>FIRST YEARS</td>
</tr>
<tr>
<td>Cigarette smoking</td>
<td>21(60.0%)</td>
<td>21(67.7%)</td>
<td>6(17.1%)</td>
</tr>
<tr>
<td>Regular alcohol intake</td>
<td>32(91.4%)</td>
<td>25(80.6%)</td>
<td>0(0.0%)</td>
</tr>
<tr>
<td>Binge drinking</td>
<td>21(60.0%)</td>
<td>18(58.0%)</td>
<td>6(17.1%)</td>
</tr>
<tr>
<td>Khat chewing</td>
<td>30(85.7%)</td>
<td>29(93.5%)</td>
<td>5(14.2%)</td>
</tr>
<tr>
<td>Bhang use</td>
<td>28(80.0%)</td>
<td>23(74.1%)</td>
<td>5(14.2%)</td>
</tr>
</tbody>
</table>

Table 8 shows the distribution of drug and substance use among 1st year and 4th year students.
More male students reported cigarette smoking (23.3%), regular alcohol intake (16.6%), and bhang use (10.0%) than female students (8.3%, 5.5% and 5.5% respectively). Binge drinking was reported by almost the same number of first and fourth year students.

<table>
<thead>
<tr>
<th>DRUG/SUBSTANCE</th>
<th>NEVER USED</th>
<th>STOPPED USING</th>
<th>CURRENTLY USING</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>FEMALES</td>
<td>MALES</td>
<td>FEMALES</td>
</tr>
<tr>
<td>Cigarette smoking</td>
<td>23(63.8%)</td>
<td>19(63.3%)</td>
<td>10(27.7%)</td>
</tr>
<tr>
<td>Regular alcohol intake</td>
<td>33(91.6%)</td>
<td>24(80.0%)</td>
<td>1(2.7%)</td>
</tr>
<tr>
<td>Binge drinking</td>
<td>22(61.1%)</td>
<td>17(56.6%)</td>
<td>4(11.1%)</td>
</tr>
<tr>
<td>Khat chewing</td>
<td>33(91.6%)</td>
<td>26(86.6%)</td>
<td>3(8.3%)</td>
</tr>
<tr>
<td>Bhang use</td>
<td>27(75%)</td>
<td>24(80.0%)</td>
<td>7(19.4%)</td>
</tr>
</tbody>
</table>

Table 9 shows the gender distribution of drug and substance use among undergraduate dental students of UON DS.

4.4.4 Oral hygiene practice

Concerning their oral hygiene practices, 35 (53.0%) brush their teeth once a day in the morning and 31(47.0%) brush their teeth twice a day; in the morning and at night before sleeping. 

![Figure 12: level of education distribution of frequency of tooth brushing.](chart.png)
More female (52.7%) than male (40.0%) students reported brushing their teeth twice a day; in the morning and at night.

Figure 13: gender distribution of frequency of tooth brushing.
CHAPTER FIVE: DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

5.1 DISCUSSION
The main objective of this study was to determine the oral health knowledge, attitude and practice among first and fourth year dental students at the University of Nairobi Dental School. Determination of knowledge included assessment of the importance of frequent dental check-up, harmful effects of oral parafunctional habits, the influence of diet and drug abuse on oral health, the recommended type of toothbrush and why and how often one should change their toothbrush.

Determination of attitude included whether they have ever been to a dentist and of not, then the reason why. Determination of oral health practice involved assessment of frequency of dental visits, oral parafunctional habits practiced, drugs abused, frequency of tooth brushing and when they brush their teeth.

All students stated the importance of regular dental check up. 90.0% knew oral parafunctional habits to be potentially harmful use of oral structures and were aware of harmful effects of drug abuse on oral health. 93.9% were aware of the effects of diet on oral health. 60.6% stated three months to be the ideal period to use a toothbrush before changing it and 80.3% preferred toothbrushes with soft bristles to avoid injury to the gingiva. Unlike a similar study done among Turkish dental students (Peker I. et al, 2009), the difference between males and females for using hard bristled toothbrushes was not statistically significant.

37.9% had never been treated by a dentist. Majority (65.4%) gave the main reason as no pain to make them go to the dentist. This is almost similar to a study done among Jordanian dental students (Alomari Q et al, 2006) in which 50% of the students stated dental pain to be the main reason for a dental visit. This contradicts their earlier statement that regular dental checkups are important in maintaining good oral health.

37.87% go for dental checkups at varying frequencies; females (56%) being slightly more than males (44%). Majority of them were fourth year students (64%). Although not a lot, the gender
difference may be attributed to the fact that females tend to generally be more concerned about their appearance and seek help at any discomfort. As expected, majority of those who go for regular dental checkups were clinical students as opposed to pre-clinical students.

At 21% pen biting was the most frequent current oral parafunction and was more common in males (16.6%). This is unlike a one year prospective study done on dental students (Marklund S. et al, 2008) on the incidence and prevalence of myofacial pain in the jaw-face region in which female students presented with an almost fourfold incidence.

15.2% were current smokers most of them being first years (22.8%) and males (23.3%). This is almost similar to a study done on undergraduate dental students at an English University (Underwood B et al, 2008) in which 27% of males reported tobacco smoking and a study done among dental students in Tanzania (Amemori M. et al, 2011) in which 12.8% of the students were current smokers but different in that in this study, all were males. The fact that majority of the smokers were pre-clinical students, is in accordance to the expectation that the incidence of smoking among clinical students should be lower given that they give smoking cessation counseling to their patients and have learnt the detrimental effects of smoking on oral health in depth.

10.6% regularly drink alcohol, majority of them being fourth years (12.9%) and males (16.6%). This is unlike a study done undergraduate dental students at an English University (Underwood B et al, 2008) in which 63% of the male students reported regular alcohol intake.

The incidence of binge drinking was 27.3%, majority being fourth years (32.2%) and females (27.7%). This is unlike a study done undergraduate dental students at an English University (Underwood B et al, 2008) in which binge drinking was reported by more males (69.5%) than females (66%). Similar to the results found in this study, binge drinking was more common in students in clinical years than pre-clinical in a Tanzanian study (Amemori M. et al, 2011).

7.6 % were current cannabis users, majority being fourth years (9.6%) and males (10.0%). Unlike an English study (Underwood B et al, 2008) in which majority of those who
had ever used cannabis were males (38%); 28.8% had ever used cannabis; 20% of males and 25% of females. The high incidence among clinical students may be attributed to higher stress levels due to increased work load.

Majority of the students (53.0%) brushed once a day in the morning. More females (52.7%) than males (40.0%) brushed twice daily. This could be attributed to the fact that females generally tend to care more about hygiene. Just like a study done among Jordanian dental students (Alomari Q. et al, 2006), more clinical students brush their teeth twice a day than preclinical students although the incidence was four fold among Jordanian students but almost double among dental students at the University of Nairobi. This is expected since they have learnt the ideal oral hygiene practices and they educate their patients on the same.
5.2 CONCLUSIONS

Based on the findings of this study, the following conclusions were made:

1. 37.9% of the students had never been to a dentist despite all of them having stated the importance of frequent dental checkups.
2. More fourth year students than first years practiced recommended oral health practices like regular dental check-ups (64.0% and 36.0% respectively) and brushing their teeth twice daily (64.5% and 35.4% respectively).
3. More fourth year students than first year students had stopped habits that were potentially harmful to their oral health like cigarette smoking (25.8% and 17.1% respectively), lip biting (22.5% and 5.7% respectively), and opening soda bottles using teeth (19.3% and 11.4% respectively) among others.

5.3 RECOMMENDATIONS

Based on the results of this study, the following recommendations were made:

1. There is a need to introduce oral health education earlier in the pre-clinical years with emphasis on the relevant subjects like Oral Pathology and Periodontology.
2. A comprehensive study should be carried out to explain the disparity in oral health practice between male and female students.
REFERENCES


APPENDIX II

CONSENT FORM

THE PURPOSE OF THE STUDY

I am a level III undergraduate student at the University of Nairobi dental school. I am currently conducting a study whose aim is to determine the knowledge, attitudes and practices on oral health amongst 1st & 4th year dental students at the University of Nairobi. I humbly request for your participation in this study as it will form part the requirements of my degree course. Kindly fill in the questionnaire.

The data obtained from these questionnaires will be recorded and analyzed for research purposes only.

Your participation will be highly appreciated.

Thank you.

Ngure Sheila W

VOLUNTARY PARTICIPATION

I understand that I have entered this study voluntarily and that I can terminate that participation at will without consequences. I also undertake that my participation does not entail any financial benefit.

ANTICIPATED RISK

There is no risk anticipated in participating in this study.

CONFIDENTIALITY

The information given to the researcher will be kept in strict confidence. No information by which your identity can be revealed will be released or published.

I the undersigned having been informed about the study/having read the above, having had time to ask questions and having received answers concerning issues I did not understand, do willfully give consent to participate in the study.

Student’s signature………………………… Date…………………………
APPENDIX III

ORAL HEALTH KNOWLEDGE, ATTITUDE AND PRACTICES AMONG FIRST AND FOURTH YEAR DENTAL STUDENTS AT THE UNIVERSITY OF NAIROBI.

QUESTIONNAIRE

This is a community dentistry research project being carried out as a partial fulfillment for the award of bachelor of dental surgery degree at the University of Nairobi.

Participation is voluntary and any information filled will be treated with utmost confidentiality and will only be used for the purposes of this study.

You are kindly requested to answer all questions by ticking where appropriate or filling in the blanks.

AGE …………………………

GENDER …………………………

YEAR OF STUDY …………………………

DENTAL CHECK UP

1). Have you ever been treated by a dentist?

Yes  .. No  . (go to Q 6.)

2). How often do you visit your dentist?

a) Regularly every 6–12 months

b) Occasionally

c) When I have dental pain
3). When was the last time you visited a dentist?
   a) Six months ago
   b) Last 6–12 months
   c) Last 1–2 years
   d) Last 2–5 years
   e) More than 5 years

4). The treatment(s) sought during your last visit to the dentist was (were):
   a) Check up/consultation
   b) Take x-rays
   c) Scaling
   d) Treat my gums
   e) Filling
   f) Crown/bridge
   g) Orthodontic treatment
   h) Tooth extraction
   i) Others (specify)
5). The reason for your last visit to the dentist was:

   a) Dental pain

   b) Family & friend advice

   c) A dentist advised me

   d) Another reason (specify)

6). What are your reasons for not visiting the dentist?

   a) I am afraid of the handpiece.

   b) I am afraid of the dental needle

   c) Treatment cost is high

   d) There are no dental clinics nearby

   e) There is no time

   f) There is no pain to go to dentist

   g) Long time spent in the waiting room

   h) Don’t like people working in my mouth

   i) Other (specify)

7) Do you think it is important to go for regular dental check up?

   Yes

   No
ORAL PARAFUNCTION

1) What do you understand by oral parafunction?

2) Which of the following habits do/have you ever perform(ed)?

<table>
<thead>
<tr>
<th>Habit</th>
<th>currently</th>
<th>Used to but stopped</th>
<th>Never have</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thumb sucking</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nail biting</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lip biting</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Opening soda bottles</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bruxism</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pen biting</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other (specify)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3) Do/did the above mentioned oral habits affect your oral health in any way?

Yes é é é é é é .

Noé é é é é é é
DIET & NUTRITION

1) Do you think the frequency and kind of food you eat have any effect on your oral health?

Yesé é é ...

Noé é é é

DRUG & SUBSTANCE ABUSE

1) Which of the following do/have you ever participated in?

<table>
<thead>
<tr>
<th>Drug/substance</th>
<th>Still using</th>
<th>Stopped using</th>
<th>Never used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cigarette smoking</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regular alcohol intake</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Binge drinking</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bhang intake</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Khat chewing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other (specify)</td>
<td>é é é é é é é é é é é é é é é</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2) Are you aware of any harmful effects of the above to your oral health?

Yesé é é é.

Noé é é é é
ORAL HYGIENE

1) How often do you brush your teeth?
   a) Less than once per day
   b) Once per day
   c) Twice per day
   d) More than twice per day

2) What do you use to clean your teeth?
   a) Brush + toothpaste
   b) Dental floss
   c) Mouthwash
   d) Toothpicks
   e) Others (specify)

3) When do you brush your teeth?
   a) Morning
   b) Noon (after lunch)
   c) Before going to bed
   d) Other times (specify)
4) For how long have you used your current toothbrush?
   a) 1-2 weeks
   b) 3-4 weeks
   c) 1-3 months
   d) Don’t know

5) After how long should you change your toothbrush?
   a) 1 month
   b) 2 months
   c) 3 months
   d) Don’t know

6) What type of brush is recommended for cleaning your teeth?
   a) Hard
   b) Soft
   c) Don’t know

7) What is the reason for your answer in Q6?

YOUR PARTICIPATION IS HIGHLY APPRECIATED