

**KNOWLEDGE, ATTITUDE AND PRACTICE OF DENTAL HEALTH CARE
AMONG PRIMARY SCHOOL PUPILS IN ZARIA**

BY

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SEPTEMBER, 2014

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M.ED/EDUC/5998/2009-2010**

**A THESIS SUBMITTED TO THE POSTGRADUATE SCHOOL,
AHMADU BELLO UNIVERSITY,
ZARIA**

**IN PARTIAL FULFILLMENT OF THE REQUIRMENTS FOR THE AWARD OF THE
DEGREE OF MASTER OF HEALTH EDUCATION (M.ED)**

**DEPARTMENT OF PHYSICAL AND HEALTH EDUCATION,
FACULTY OF EDUCATION,
AHMADU BELLO UNIVERSITY, ZARIA, NIGERIA.**

SEPTEMBER, 2014

DECLARATION

I declare that this work titled “Knowledge, Attitude and Practice of Dental Healthcare among Primary School Pupils in Zaria” was done by me in the Department of Physical and Health Education under the supervision of Prof. C. O. Adebite (late) and Dr. E. A. Gunen. To the best of my knowledge, this work has not been presented for the award of degree at any University. The information derived from literature has been duly acknowledged in the reference section.

OlogunMezafiLilian

Date

CERTIFICATION

This thesis titled “Knowledge, Attitude and Practice of Dental Health Care among Primary School Pupils in Zaria” by Ologun M. Lilian, meets the regulations governing the award of the degree of Master (M.Ed)in Health Education, Ahmadu Bello University, Zaria and is approved for its contribution to knowledge and literary presentation.

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DEDICATION

I dedicate this thesis to God Almighty, the giver of life and grace.

ACKNOWLEDGEMENTS

The researcher wishes to express profound gratitude to Prof.C. O. Adegbite (late)for the role she played in making this work a success. May God grant her eternal rest. Much gratitude goes to Dr. E. A. Gunen for his immense contribution to the success of this work.May God grant you peace and long life.

Sincere appreciation is owed to all the lecturers in the Departmentof Physical and Health Educationfor the professional assistance they rendered the researcherduring this programme.May God keep you and your families.Much gratitude also goes to the school headmasters and pupils fortheir effort in making this work a success. God bless you all.

Great indebtedness goes to Dr. TundeAdeshina for prayers and the fatherly role played in the course of this work.May God increase you on every side.

Finally,profound gratitude goes to the researcher's parents, Mr. Patrick Ologun and Beatrice Ajibola and beloved sisters, Magdalene and Blessing for their prayers and financial support. May God grant you long life and prosperity.

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ABSTRACT

The purpose of the study was to assess, “The knowledge, attitude and practice of dental health care among primary school pupils in Zaria”. The expo-facto research design was used for the study because the information needed was within the respondents and was elicited by the research instrument. Stratified random sampling technique was employed for the study of a population of eighty six thousand and one pupils (86,0001). The 173 public primary schools were stratified into Zaria and SabonGari Local Government Areas of Kaduna state. A sample size of 382 was drawn for the study. A self constructed questionnaire was used for the collection of data and the statistical package of social sciences (SPSS) was used for the analysis. The major hypothesis for the study states that “There is no significant relationship between knowledge, attitude and practice of dental health care among primary school pupils in Zaria”. Descriptive statistics of frequency and percentages were used to analyse the main variables. Means and standard deviation were used to answer the research questions. The major and sub-hypotheses were tested with PPMCC and paired sample t-test respectively. The result of the major hypothesis showed that there was no significant relationship between Knowledge, Attitude and Practice of dental health care among primary school pupils in Zaria and the hypothesis was therefore retained. Generally, the result of the study revealed that the Knowledge and Attitude of dental health care among Primary school pupils in Zaria was still below satisfactory level. It also revealed that the practice of oral hygiene among the pupils was majorly the use of finger/water and salt/ash. Only a small proportion used tooth paste and brush. The researcher recommended that there is need for their Knowledge, Attitude and Practice of dental health care to be improved upon through regular oral health education promotion programme, school teachers and parents should intensify on their effort in educating children on the importance of oral hygiene both at home and at school.

Operational Definition of Terms

- **Knowledge:-**Information acquired about dental health care.
- **Attitude:-**The behavior of the primary school pupils about dental health care.
- **Practice:-** The way and manner the primary school pupils observe their oral hygiene.
- **Pupils :-** Children between 8-13 years in primary school in Zaria.

CHAPTER ONE

1:0 INTRODUCTION

1:1 Background of the Study

Dental health care and education have a direct relationship with the whole child's health and well being. Studies have shown that appropriate oral health education can help to cultivate oral health practice (Ab-murat& Watt 2006). The change to healthy attitude can be influenced by giving adequate information, motivation and practice of the measures to the children (Smyth, Caamano&Femandez-Reveiro 2007). Dental health education is an accepted procedure in schools based on the assumption that the knowledge needed for good dental health practice can result in behavioural change (Betsey, 1980). Schools therefore, have the responsibility to help protect, maintain and improve the health of their students through the school health programmes. This is why the total school health programme is composed of school health services, health education/instruction, nutrition services and healthful school living.

The aspect of school health programme that introduces dental health education is the School health instruction – a planned, sequential curriculum that addresses the physical, mental, emotional and social dimensions of health of school children. It is designed to motivate and assist students to maintain and improve their health, prevent diseases and reduce health related risk behaviour. (Maryland School Health Services, 2006). It allows student to develop and demonstrate health related knowledge, attitude, skills and practices. The comprehensive health instruction curriculum includes a variety of topics including dental health education where pupils are taught about oral hygiene principles and disease associated with poor dental health care. Therefore, dental health education depends largely upon the acquisition of accurate and useful knowledge concerning good dental health on the part of the students. This becomes successful when the knowledge is put into daily practice resulting in behavioural change.

In dental health as in other instructions, the compilation of facts by the learner is not enough and knowing what to do does not guarantee that it will be done (Ajala, 2005&Cooper, 2002). For example, to know that it is necessary to brush your teeth once or twice daily and actually doing it are two different things completely. In other words people may be aware of the dental ills that are associated with bad oral hygiene and yet fail to maintain it. For dental instruction to be truly successful, a change must result in attitude, habit or skill. This can be achieved by selecting learning experiences that allow the learner to perform the desired behavioural outcomes and a means to evaluate the retention of content covered and changes in behaviour of the learner.

Dental health care measures still include brushing the mouth once or twice daily. This ensures that bacteria and microbes present in the mouth are killed and removed from time to time. The use of chewing stick also helps in cleaning the teeth but not as effective because the oral cavity has a number of space that are very small and narrow where even the bristles of the brush cannot reach, hence flossing becomes an effective mechanism to ensure good dental hygiene and health as it helps to remove food particles and debris between the teeth. (Check dent, 2011). Regular visit to the dentist will also help to detect the onset of dental disease.

The aim of intervention among primary school pupils is to create awareness and increase knowledge on the importance of oral hygiene among pupils within the ages 8-12 years to promote positive behavioural change (Nguyen 2008). .

1:2 Statement of the Problem

Surveys have shown that dental disease is on the increase globally (Bagramian 2009 & WHO, 1997). This has been attributed to many factors among children in developing nations of

the world including Nigeria. One important factor is lack of knowledge of dental health care. Evidence has shown that strong knowledge of oral health demonstrates better oral care practices (Smyth, et al; 2007). It has been observed that most primary school teachers do not give dental health instruction to pupils adequately hence they are not aware of various dental health problems associated with poor oral hygiene. Generally, children are faced with health problems that can either predispose them to dental disease or complicate dental care. Nutritional disorder (vitamin C deficiency) and diabetes have also been identified as contributing factors to periodontal disease. For children with diabetes, good oral hygiene should begin at a young age (Lamster, Lalla, Borgnakke & Taylor, 2008). A lack of understanding of conditions linked with dental disease has often times hindered the process of preventing the occurrence of various dental problems among Nigerian children. Dental investigators have explained that plaque plays a definite role in the initiation and progression of dental disease. Plaque is a mass of soft accumulated material, covering areas of the mouth that are not cleansed.

A lack of awareness about the link between nutrition and dental disease has also caused a lot of dental health problems like scurvy and dental caries etc. Periodontal pockets have been observed among children from as early as 10 years of age and this has been attributed to general nutritional deficiency and poor oral hygiene (Barenes 2001).

Lack of oral hygiene practices has been identified as a possible predisposing factor for occurrence of dental caries. Children generally engage in unhealthy habits that can cause dental problems like failing to brush, nibbling of sweets and consumption of sugary snacks. All these can cause acid formation which eats away the tooth enamel. The general health of children who suffer dental disease is put further at risk and because of this risk to health, their dental care is of

vital importance. It is therefore paramount to instill proper oral hygiene habit early in school children in order to prevent dental ills and promote healthy teeth growth.

The researcher has personally observed tooth discoloration, dental caries and gingivitis among school children in Zaria and Sabon-Gari local government areas and was therefore prompted to investigate the knowledge, attitude and practice of dental health care among the primary school pupils.

1:3 Research Questions

The study sought to answer the following questions.

1. Do primary school children in Zaria have the knowledge of dental health problems?
2. What is the attitude of the school children towards dental health care?
3. Do primary school children in Zaria practice dental health care?

1:4 Purpose of the Study

The purpose of the study was to investigate the knowledge, attitude and practice of dental health care among primary school pupils in Zaria and SabonGariLocalGovernment Areas of Kaduna state. Specifically,the study will find out;

1. Knowledge of dental health care among primary school children in Zaria.
2. Attitude of primary school pupils towards dental health care.
3. Practice of dental health care among primary school pupils in Zaria.

1:5Basic Assumptions

1. Basic knowledge about dental health care will improve pupil's attitude towards oral hygiene in Zaria.
2. An awareness of the link between diet and oral health will help discourage frequent consumption of sugary snacks especially between meals.
3. The practice of dental health care is influenced by classroom instruction.

1:6 Hypotheses

For the purpose of this study, the following major and sub-hypotheses were raised.

1:6:1 Major Hypothesis

There is no significant relationship between knowledge, attitude and practice of dental health care among primary school pupils in Zaria.

1:6:2 Sub-hypotheses

1. There is no significant difference between Knowledge and Attitude of dental health care among primary school pupils in Zaria.
2. There is no significant difference between Knowledge and Practice of dental health care among primary school pupils in Zaria.
3. There is no significant difference between Attitude and Practice of dental health care among primary school pupils in Zaria.

1:7 Significance of the Study

The study which assessed the knowledge, attitude and practice of dental health care among primary school children in Zaria is significant in the following ways.

1. The result of this study will elicit information that would educate public primary school pupils within Zaria on the importance of dental health care and will also help them to

cultivate healthy oral health practice thus reducing the cases of dental diseases among primary school pupils in Zaria.

2. The result of this study will provide data on the level of dental health care practice among primary school pupils in Zaria and will show the behaviour of pupils regarding dental health care.
3. The result of this study will help primary school teachers to improve on their effort in the teaching of dental health education in schools.

1:8 Delimitation of the Study

The study was delimited to; The Knowledge, Attitude and Practice of dental health care among public primary schools in Zaria. Only pupils in classes 3-6 were used for the study. These age groups are considered to have acquired health education knowledge capable of influencing behaviour in various ways. Both male and female primary school children were used for this study.

1:9 Limitation of the Study

The limitation of this study was the inability of some pupils in the lower classes to read and comprehend what was contained in the questionnaire. However, the researcher and the school teachers (research assistants) helped in overcoming this challenge by explaining and interpreting the content of the questionnaire in the language they could understand best.

CHAPTER TWO

2:0 REVIEW OF RELATED LITERATURE

2:1 Introduction

The purpose of this study is to investigate the knowledge attitude and practice of dental health care among primary school pupils in Zaria. Thus, this chapter undertakes a review of literature related to the study and it is therefore discussed under the following subheadings.

2.2. Concept of Dental Health Care

2.3 Knowledge of Dental Health Care

2.4 Attitude of Dental Health Care

2.5 Practice of Dental Health Care

2.6 Dental Irregularities

2.7 Nutrition and Healthy Teeth

2.8 Dental Health of Teenagers and Children

2.9 Dental Problems

2.10 Summary

2.2 Concept of Dental Healthcare

Dental health care begins with good oral hygiene. It is simply the act of keeping the mouth and teeth clean by brushing properly and regularly to prevent plaque formation which can lead to other dental problems. Dental hygiene is the science and practice of the recognition, treatment and prevention of oral disease (.ADHA 2006). It is of great importance to the structure and function of the human teeth. It is based on this fact that the World Health Organization (WHO, 1985), defined dental health as the state of complete normality and functional efficacy of the teeth and surrounding structure related to mastication and maxillo facial complex. Good oral hygiene routine should be established as early as infancy and continued throughout life.

Oral health care is a job that begins even before a child gets his or her first tooth. You can help your child get a head start on having a healthy mouth and smile by wiping your infant's gums with a damp washed cloth or gauze pad after each feeding to remove plaque and food residue. (ADHA, 2006)

A child's first oral health visit should come around his or her first birth day or six months after the first tooth erupts. The oral health professional will help to check for cavities in the primary teeth and watch for developmental problems. At age two or three, parents should teach their children proper brushing and flossing techniques and they should monitor the brushing and flossing until age seven or eight when the child has the dexterity to do it alone. Often there are natural spaces between the primary teeth to hold the place for the permanent teeth. If spaces are present, you do not need to begin flossing until the teeth touch. For older children with permanent molars, parents should consider having sealants applied. Sealants are thin protective plastic coatings placed on the chewing surfaces of back teeth. This helps to reduce pit and fissure surfaces in the back teeth by more than 60%. One of the ways to protect the child during contact sport is by wearing mouth guards. Changing the tooth brush up to three or four times a year is necessary, most importantly after every illness to avoid bacteria and germs. Consumption of sugar should be limited and eating fruits and vegetables should be encouraged. Snacking between meals should be avoided. The more you take care in your eating habits and keeping healthy by maintaining clean teeth, the more it is beneficial on the long run.

There are a number of health services that are provided by dentist in order to ensure good oral health and care. Some of these dental health services include: cleaning, teeth coating, placing dental crowns, teeth whitening for discolored teeth, root canal treatment and anti-cavity

fillings and artificial tooth implantation etc. Occasional visits to the dentist should be encouraged as this can help to detect the onset of any dental problem.(ADHA, 2006)

2.3 Knowledge of Dental Health Care

The schools provide an ideal setting for providing dental health education at an early stage. Prasi, Ajayi& Mash (2013). It has as its aim, the dissemination of dental health facts in such a way that the behaviour of the learner is changed. Knowledge of dental health care can help the school children to alter unhealthy habits. According to Betsey (1980), dental health education depends largely upon the acquisition of accurate and useful knowledge concerning good dental health on the part of the individual.This becomes successful when the knowledge is put into daily practice resulting in behavioural change. The awareness of dental health care is poor among school children as most of them do not know some of the dental problems that they experience. It is only when they are exposed to dental information that they can understand and know their dental health status. There are multiple reasons for school children to be susceptible to dental disease which include social, economic and demographic factors like awareness, limited access to professional dental care and lack of all the more basic resources. Oral health knowledge is considered to be an essential pre-requisite for health –related practice, and studies have shown that there is an association between increased knowledge regarding dental hygiene and better dental health. Dental hygiene is considered to be the most important factor in preventing dental disease. Those who have assimilated the knowledge and feel a sense of personal control over their oral health are more likely to adopt self care practices. Developing such a knowledgeplays a key role in improving the dental health of school children. Kompalli, Pratap, &Mahalakshini(2013).

The American Dental Association (2006) states the following objectives as a basis for school dental health programme:

2.3.1 To help every school child appreciate the importance of healthy mouth:

It is possible for every school child to have a healthy mouth if the knowledge of dental health care is put into daily practice by actually brushing, at least twice daily and observing every other dental hygiene tips. The teeth are meant to last for a life time but somehow along the line, a lot of people lost their teeth due to dental problems that have invaded the oral environment. Plaque has been known to be the major causes of periodontal diseases, but other factors can also affect the health of the gums. Periodontal (gums) disease, including gingivitis and periodontal, are serious infections that if left untreated can lead to tooth loss. Periodontal disease can affect one tooth or many teeth. The main cause of periodontal disease is bacterial plaque, a sticky colourless film that constantly forms on the teeth (AAP 2007). An important part of good oral health is to know how to brush and floss correctly. Thorough brushing each day removes plaque.

2.3.2 To help every school child appreciate the relationship of dental health to the general health and appearance:

A comprehensive dental health programme is based on the concept of teaching the “whole child,” emphasizing dental health as an integral part of total body health.

There is a direct relationship between dental health and the general body health. According to ADA (2007), the health of your gums can affect your overall health. Recent studies have shown a possible link between periodontitis and other disease, such as diabetes and heart disease. According to Saunders and Robert (1997), cardiovascular disease in children complicates dental

care by making them susceptible to infective endocarditis and for children taking warfarin, there is the risk of prolonged bleeding. Although the cases of cardiac disease is rare in children as only one baby out of hundred is born with a cardiac defect. The condition of your dental health can also affect appearance as it can cause physical disfigurement.

2.3.3 To encourage the observance of dental health practices, including personal care, professional care, proper diet and dental habit:

Positive dental hygiene and health should be part of your day to day routine. Dental health starts with good oral hygiene. Proper brushing helps to remove the germs that live on your teeth from outside, inside and chewing surfaces of your teeth. Gargliadi (2007). Personal and professional care of the teeth is necessary for dental health. Nutritional factors can also affect tooth integrity, enamel solubility and salivary flow and composition. Even moderate nutritional factors can cause defect in tooth development. In humans, deficiencies of protein calories, vitamins, A, C, D and Iodine and excesses of fluoride have all been shown to affect human dentition development, Depaola, Faine & Palmer, (1999)

2.3.4 To correlate dental health activities with the school health programme:

Many health problems facing students today are both interrelated and preventable through co-ordinate school health programme, schools can help young people acquire the knowledge and skill necessary to make healthy choices. A co-ordinated programme is holistic not focusing solely on physical health but also addressing other areas of health. When dental health activities are

correlated with school health programme, It will help school children to overcome a lot of dental health challenges. Integrated in the school health programme, nutrition services should promote a healthy diet among school children. The ultimate purpose is to promote health by emphasizing a balance and adequate eating habit. Nutrition, services should provide students, access to a variety of nutritious and appealing meals that accommodate the health and nutrition need of school children. (Maryland, school health service 2006)

2.3.5 To stimulate dentist to perform adequate health services for children:

There are a number of health services that are provided by the dentist in order to ensure good oral health care. Some of the commonly used dental services include; cleaning, flossing, teeth, coating, placing dental crowns, teeth whitening for discoloured teeth, root canal treatment and anti-cavity fillings, artificial tooth implantation and so on. In all of these cases, care is taken to ensure that oral hygiene is not compromised for aesthetic purposes. Check-dent (2011)

If there must be a reduction in cases of dental health problems among school children, they must first have adequate knowledge about dental health care and disease associated with poor oral hygiene. This will help them improve on their attitude towards dental health care.

2.4 Attitude of Dental Health Care

Psychologists define attitude as a learned tendency to evaluate things in a certain way. This can include evaluation of issues, object, or event. Attitude can be explicit or implicit. Explicit attitudes are those that we are consciously aware of and that clearly influence our behaviours and beliefs. Implicit attitudes are unconscious, but still have an effect on our beliefs and behaviours. Kendra & Hockey, (2007).

2.4.1 How Attitudes Form

Attitude can be formed as a result of experience; when children are exposed to certain learning experience relating to dental health, it can have a positive influence on their attitude. According to Betsey (1980), health education is concerned with the provision of learning experience for the purpose of influencing attitude and behaviour relating to the individual's health. Knowledge alone is not always the desired result. The belief in dental health care has to be formed by the individual in order to have a change of attitude towards it. Belief is a mental attitude that a proposition is true rather than false. As a consequence, if you believe something is true, you must be willing to act as if it were true. Everything we do can be traced back to our beliefs. what prompts people in most cases to seek preventive care is the belief that they could be susceptible to dental disease and also that preventive dental visit is beneficial. Saunders & Roberts (2007). The utilization of knowledge acquired is what brings behavioural change and consequently dental disease prevention.

Attitude can also be learned by observation; when some one who lives around you espouses a particular attitude, you are likely to develop the same belief. For example, a child who spends a great deal of time observing the attitude of his/ her parents toward dental hygiene could begin to demonstrate a similar attitude depending on what he/she has observed.

Operant conditioning can also be used to influence how attitude develop. For example, a child who is fond of not brushing his teeth after waking from sleep may often be scolded by his parents or any member of the family. This unfavorable feedback from those around him could make him to develop a positive change in attitude. Smith & Mackie (2007).

Maintaining a healthy mouth is an individual responsibility. A bad attitude towards oral hygiene is one of the causes of plaque formation which has led to dental problems and eventually tooth

loss in most children. Some of these unhealthy habits that are very common among children are; failing to brush the teeth, ineffective brushing techniques, nibbling of sweets and eating sugary snacks etc. Dental decay can be prevented by regular cleaning and by reducing the quantity and frequency of eating refined sucrose and by ensuring that the teeth come in contact with an adequate amount of fluoride.

Sugar eating and sweet nibbling addiction are often found in children and teenagers than in adult. It is therefore logical to consider children and teenagers as the most susceptible group to the pathogenesis of dental caries, because dental caries is a sugar dependent disease. Studies have shown that girls usually have greater preference for sweet foods while, boys will opt for higher fat and salt content fast foods and snacks. Oogarith-Pratap (2007). Most of the studies conducted on knowledge, attitude practice of dental health care showed that most children do not like dental visit for fear of pain and dental needles. Adekoya, Sofowora, Nasir, Oginni&Taiwo (2006) reported that school children who had never visited the dentist had significantly higher caries prevalence than other children. Children and teenagers can be helped to develop a better attitude towards dental health care by a careful instruction of ways of maintaining dental health care either by the classroom teachers, school nurses and parents. This is important because dental health education is seen as the best way to improve attitude and to solve the public health problem of dental disease among the school-age population. The change in attitude may take short or longer time depending on the attention span and motor ability of the child. The person instructing the child should be able to condescend to the level of the child and should praise the child when he observes a change in behaviour by way of motivating the child.

It is also known that children like colourful materials, therefore tooth brushes of varieties of colours and good tooth paste should be provided for children and teenagers. This will encourage them to improve on their attitude.

2.5 Practice of Dental Health Care

Ideally, teeth should be cleansed after every meal, but not many adults do this let alone children. The time spent in cleaning or brushing the teeth is also an issue because every morning, people rush through the routine of cleaning the mouth and teeth without taking time to do it properly and after a hard day's work they get so tired that they don't bother to clean the teeth after dinner.

Tongue cleaning is very important as it helps to reduce bad breath and improve oral hygiene status because a lot of bacteria reside in the rough corrugated surface of the tongue. Most dental professionals advise that poor oral hygiene, such as not brushing, not flossing, or not rinsing enough is the leading cause of gum disease and tooth decay. The longer food particles are allowed to stay in the mouth, the greater the chance of decay. So the mouth should be rinsed immediately after eating especially sugary substance to prevent the formation of plaque ADHA (2006). Brushing twice daily, flossing, use of dental sealants dental visit and use of mouth washes e.t.c., are essential for the health of your teeth and gums.

2.5.1 How to Brush

Start by brushing the sides of your teeth that touch your cheek. Angle your tooth brush so it is up against your teeth and gums and jiggle the tooth brush back and front in small strokes. Do only a few teeth at a time and do it several times in each spot. When you are done with the cheek side of your top and bottom teeth, brush the side that is facing your tongue on the top and bottom teeth in the same way. Brush also the flat, chewing surface of your top and bottom teeth. These

surfaces have many deep grooves where germs can hide out. Brush your tongue when you finish brushing your teeth. This makes your mouth feel fresher. (Gagliardi, 2007)

2.5.2 Flossing

Plaque can still remain on your teeth even after brushing unless flossing is used. Flossing will help to remove plaque from between the teeth, especially in those places that are hard to reach. By combining the use of dental floss with tooth brush to remove plaque thoroughly; you will be able to prevent cavities and infection from your gums.

2.5.3 How to Floss

First wrap 18-inch piece of floss around the middle finger of each hand. Hold about an inch of floss tightly between your thumb and forefinger. Gently slide the floss between the teeth. Be certain not to snap the floss in or you may injure your gums. Press the floss against one side of the tooth and move the floss up and down the tooth several times floss both sides of every tooth. When you move onto the next tooth, be sure to use a clean section of the floss.

We should use an effective clinically tested tooth paste that provides long lasting protection between brushings. Poor oral hygiene was identified as a possible predisposing factor for caries occurrence, tooth brushing alone is generally agreed as insufficient for caries prevention and positive results are often attributed to the use of fluoride containing tooth paste (winter et al; 1990). Snacking between meals should be discouraged and consumption of sugary snacks. Consumption of fruits and vegetables should be encouraged .Vitamin C and flavanoids are powerful antioxidants that protect gums against cell damage and promote healing, vitamin C promotes healthy capillaries, which aids oral tissues in staying healthy. Its deficiency may cause oral health problems like swollen and bleeding gums. When the knowledge of dental health

education is not put into daily practice by actually brushing and observing oral hygiene principles, dental disease and mouth odour (halitosis) will always result.

2.5.4. Use of Dental Sealants

They are thin plastic coating which is applied to the chewing surface of the back teeth to prevent decay. Most of the tooth decay in children and Teenagers occur on the chewing surfaces with pit and groves which tend to trap food and bacteria because of their anatomic construction. Sealants help to fill in these pits and grooves so that bacteria cannot multiply and cause decay. (Gagliardi 2007).

2.5.5. How to Apply Sealants

It is simple and may be done by a dentist or dental hygienist. The teeth are first cleaned. Then the teeth to be sealed are dabbed with a very mild acid solution which is just like vinegar or lemon juice- This acid solution makes the tooth surface to be roughened so that the sealant can be bonded to it. As soon as the tooth is prepared, the sealant is painted on to the tooth. It flows into the pit and grooves and hardens in about 60 seconds. After sealing, bacteria cannot reach the pits and grooves, hence cannot cause decay.

Sealant does not make one to feel any change when biting because they are very thin and only fill the pits and grooves. A sealant application can stay as long as five years. Sealant should be checked and applied if they wear off. Dental sealant is recommended for children and teenager because they keep the teeth healthy by protecting them from decay. The purpose of sealant is to penetrate all cracks, pit and fissures on the occlusal surface of both deciduous and permanent teeth in an attempt to seal of these susceptible areas and to provide effective protection against caries.(Gagliardi 2007).

2.5.6Use of Fluoride

Fluoride is needed for infants and children especially when their teeth are still forming under the gums. Fluoride makes teeth and bone stronger and protects it from decay. Fluoride is gotten naturally from soil, plants, animals and water. Drinking fluoridated water from birth can reduce decay by 40-65%. The effectiveness of fluoride ion in lowering the incidence of dental carries has long been established by numerous clinical studies. The fluoride from water, food, tooth paste, mouth rinses and fluoride treatment received in dental office wash over the areas of teeth that have already started decaying. The fluoride minerals make the outer surface of the teeth stronger. (Lori Gagliardi, 2007)

2.5.7. MouthWashes

The antibacterial mouth rinse is used in addition to careful daily brushing and flossing as recommended by American Dental Association (ADA, 2006). Mouth washes that contain fluoride help to protect against tooth decay. Listerine is an antimicrobial mouth rinse that contains essential oils. It helps to reduce plaque buildup and gingivitis. Listerine can be used twice daily for effective result. Mouth washes that contain stannous fluoride and amino fluoride are moderately effective, but not as effective as Listerine or chlorhexidine (Parson, 2007).

2.5.8. Dental Health Visit

Regular visit to the dentist is also very important. Your oral health professional will check for cavities in the primary teeth and watch for developmental problems. Such early signs that the oral health professional may look out for are, swollen or bleeding gums, the shape and colour of gingival tissue on the cheek side and the tongue side of every teeth are also examine by the dentist.

2.5.9.Xylitol

This is a natural sweetener that can be found in fruits such as strawberries. It is a natural sugar that helps to prevent cavities. It is contained in many sugarless products (gums and mints) that have mannitol and sorbitol. This sweetener greatly helps to reduce tooth decay. Xylitol inhibits the bacteria (*Streptococcus mutans*) that are known to cause cavities. Xylitol is actually cariostatic as shown in the Turku Finland study (Scheinin & Makinen, 1976). It has been shown effective in preventing tooth decay especially when combined with healthy eating habits for those people at moderate to high risk for decay.

2.6 Dental Irregularities

Most people live with different dental irregularities, such as crookedness, uneven spacing, protrusion and overcrowding. Dental irregularity can affect one's smile and bring about difficulty in chewing and speaking. It also causes tooth loss and gum disorders. Betsey (1980).

A bite in dentistry is defined as the way and manner in which the upper and bottom rows of teeth are aligned when they are resting against each other. Many people all over the world have these misalignment problems. Over the years, some get used to the irregularity of their teeth that they hardly feel the discomfort caused by it. Most often persons with dental issues cover their mouth when they talk and they rarely smile in order to hide their dental flaws. (Mia Barker, 2010).

2.6.1 Factors responsible for Dental Irregularities

A number of factors are responsible for this anomaly. They are:

Genetics: Dental irregularities are often the gift of genetics. It could be that someone in the family has a protruding front teeth and this could possibly be passed on to the children.

Accidents: Minor accident can also cause children to loose or fracture their teeth. Although the fractured teeth can be replaced but may bond with the bone that surrounds it. This is called

alkalosis – the abnormal fusing of the tooth to the bone. It is one of the primary reasons children grow up with crooked teeth.

Thumb Sucking or Use of Pacifier: Children who suck their thumb or use pacifiers for a time longer than necessary are at risks of having forward-extending front teeth when they grow up.

Early Loss of Baby Teeth: If the primary teeth are lost prematurely, the secondary teeth will not have reference point as soon as they come through the gum surface, this can cause dental irregularity such as crookedness.

2.6.2 Examples of Dental Irregularity

Open Bite: This kind of dental irregularity is identified by the way and manner the upper and lower rows of teeth do not meet properly when a person bites down. This condition causes more effort on the lower jaw when the person is chewing which in turn, causes the back teeth to deteriorate prematurely.

Cross Bite: In this case the upper row of the teeth is set significantly inside or outside the lower row and it makes it difficult for a person to chew properly.

Under Bite: This bite misalignment is characterized by the lower row of the teeth projecting farther ahead of the upper row of the teeth.

Crowding: This dental irregularity can occur if the secondary teeth erupt in small space on the periodontal tissue. (Mia Baker, 2010)

2.6.3 Effect of Dental Irregularity on Facial looks (Age).

The mouth of an individual can be likened to as a system, and the function is primarily for breathing, eating and swallowing. There are bones, muscles, nerves and soft tissues that are all part of this complicated system. The jaw joint called the tempo-mandibulajoint (TMJ) is the only joint in the body that both hinges and slides. This makes the joint very complex and adds

more complexity to the oral system. As teeth wear, the entire oral system undergoes early destruction and patients face age rapidly. A person can look up 20 years older when the oral system begins to deteriorate. (Cross 1980). When the oral system is not in balance, it leads to conflict within the system; teeth collide, muscles reach stages of imbalance and faces age in this process. When the teeth do not fit together properly, the muscles and joints begin to breakdown. If the teeth begin to wear, they lose their normal form and its function. As teeth wear through the enamel (the hardest substance in body) they begin to wear faster, as dentin (the main tissue located beneath the enamel of the surface of the tooth) wears seven (7) times faster than the enamel. When the teeth flatten and lose their natural form, it takes greater forces by the muscles of the face to chew food, speak and swallow. In a short while, we observe that damage is not only done to the bones that support the teeth, but we also observe significant changes on the face. The facial muscles because they are out of balance, causing more rapid aging of the face as the bones, muscles, and nerves lose their form and function.

2.7 Nutrition and Healthy Teeth

Nutrition plays an important role in oral health and healthy teeth. Healthy teeth are possible for most people, if the knowledge of dental disease is used to alter unhealthy habits. A balance diet is important in preventing cavities; however cavities are also the result of what we eat and how often we eat them. At every time we eat or chew, there are food particles or debris that becomes trapped on or between the teeth surface. when refined carbohydrates food such as bread, corn flakes, pasta, crackers and potato chips are allowed to remain in the mouth without brushing the bacteria that is already present in the mouth break down these structures into sugars. These sugars are in turn converted to acids and these acids have ability to eat away at tooth enamel. Some food, by the reason of their texture causes them to remain in the mouth for a long

time. Such foods are: caramel, sweet, butter, bread etc. thus hastening the decay process. It is therefore advisable to consume a variety of nutrient-dense foods and beverages within and among the basic food groups. Focus on fruits and vegetables, whole-grain products and fat free or low-fat milk or equivalent milk products. Reading the nutrition facts label on packaged foods before buying or consuming can help in making smart food choices. If we must take sugary snacks it must be at meal time so that increased saliva production will help to neutralize the acid attack.

Research has shown that certain foods have the ability to reduce the amount of acid that the teeth are exposed to. They are said to be dentally sound because they can fight plaque and neutralize the acid producing bacteria. Examples of such dentally sound food are: hard cheese, raw fruits, vegetables, Cashew, and peanut.

In our daily diet, it is important to alternate these dentally preferred snacks. This helps to provide a variety of choices and also ensures a balanced intake of nutritious meals. Acid producing foods include:- Honey, candy, cookies, cough drops, Doughnuts, Mints, pies, Soft drinks, Table sugar, Syrup, Cakes, Popsicles, Jellies. (Gagliardi 2007)

2.7.1 Importance of Nutrition in the growth and Development of Oral Tissues and Structure

Nutrition is very critical to early periods of growth and development. Whatever nutritional problems that occur at this stage can have long time consequences. The result of nutritional problem during initial cell formation (hyperplasia) is usually irreversible. Malnutrition, although not the only cause, is one common contributor to linear enamel hypoplasia (Ismail 1995). Malnourished children may have delayed maxillary growth and delays in tooth development and eruption compared to nutritionally normal children (Midda & Konig 1994).

In human studies conducted in areas of the world where there is extreme malnutrition, developmental defects (enamel hyperplasia) of primary teeth are common (Davies, 1998).

Oral tissues have a more rapid turnover time (3 to 7 day) than other body tissues, which increases the susceptibility of these tissues to problems associated with nutrient variability. Because of this rapid tissue turnover nutrient requirements may be higher in the oral cavity than in the rest of the body and when nutritional disturbances do exist, they may first manifest in the oral cavity (De Paola, Faine & Palmer 1999). Nutrient needs have to be met early in life to achieve the genetic potential of oral tissues and structures and to prevent permanent structural damage.

2.8 Teenagers and Dental Health

Teenagers are fond of eating junk food which can increase caries risks. Eating habits can affect both caries and enamel demineralization (Harris et al; 1999). Acid produced during fermentation of dietary carbon hydrates demineralizes enamel and can result in site-specific caries development. The nature of the carbon hydrate, length and frequency of consumption and quantity consumed will determine the extent of acid exposure and subsequent demineralization. Teens develop cavities because of their attitude to dental health. During adolescence, teens typically spend less time with their immediate family while they struggle to establish an identity and seek autonomy (Jacobson et al; 1997). As a result, peers have a greater influence than parents have in many areas, including food choices and dietary habits. Teen's dietary patterns should limit exposure to fermentable carbohydrate. Parents should provide fruits and vegetables for snacking. Brushes of varieties of colours should be provided for teens and good tasting toothpaste; this will motivate them to observe oral hygiene.

2.8.1 Children's Dental Health

Children require special oral health instruction because of their age. Teaching the child proper oral care at young age is an investment in his or her health that will pay lifelong dividends. You can set good example for them by caring for your own dental health. Dental decay (cavities) is the most common chronic disease of childhood and 70% by late adolescence (ADHA 2006). The attitude of children to oral health can predispose them to dental problems. Recent studies show that periodontal disease continues to plaque millions of American including children (Peterson 1998). Chronic gingivitis is also common among children, the mildest form of periodontal disease. Gingivitis is often caused by poor oral hygiene which leads to plaque buildup. Parents should instill proper oral hygiene in children to avoid oral health problems.

2.9 Dental Problems

Man harbors within and on his body a great variety of microorganisms that are potentially pathogenic. Disease of the teeth reflects much of what is contained in the diet. Teeth are in direct contact with all of the diet, but most of the dental diseases are related to interactions between diet and the microorganisms that live in the mouth.

2.9.1. Dental Caries

Dental caries is a bacterial disease of the dental hard tissues and occurs in certain localized site, in the dentition. It forms when bacterial breakdown of dietary carbohydrate retained in the non-self cleansing regions of the dentition produced acid which then dissolved the underlying tooth enamel thus initiating the caries lesion.

McDonald, Stocky & Avery (2004), observed that dental caries is a highly prevalent chronic sugar dependent infectious disease, affecting calcified tissue of the tooth and causing demineralization of inorganic portion with subsequent destruction of the organic substance. Dental Caries is prevalent in children and has been observed in children as young as 12 months of age.

In developing countries, the trends in dental caries prevalence among preschool children are not clear (Holm, 1990). Several factors including growing consumption of sugars and inadequate exposure to fluorides have been reportedly related to caries occurrence WHO (2014). Three factors are known to play a role in the development of dental caries; they are the host, the agent and the environment. Fejerskov (2003) believed that the factors interact to produce a variety of dental disease at varying rates and intensities. Changing living conditions due to urbanization and adoption of Western life style are often considered potential risk factors for the incidence of dental caries and recent population data shows that the prevalence of dental caries is related to socio-economic factors in developing countries as for developed countries.

2.9.2 Dental Plaque

Organisms grow easily within the oral cavity particularly on the non-self cleansing surfaces of teeth. Within the mouth are many different habitats for Colonization (Hardic & Bowden, 1974). Some sites are on the soft tissues cheeks, lips, tongue and gums or in the saliva. Hard tissues provide other sites and different parts of the teeth create different habitats. Dental plaque is usually white in colour which tenaciously adheres to the tooth surface and it is

generally film like in distribution. Dental plaque consists of some components that are derived from gingival tissue, the dietary intake, salivary and cervicular fluids. These elements, cells, Inter cellular substance, and fluid as well as microorganisms are basic to most living tissue.

A theory supported by dental investigators is that the plaque becomes attached to an underlying film called the acquired pellicle. The chemical analysis of the pellicle also indicates the presence of carbohydrates, mucopolysacharrides and lipids. As the pellicle is present most of the time, it is apparent that it is either able to rapidly after being removed or remains on the tooth by a chemical bond with the enamel. If the smooth surface of a human tooth is cleaned carefully, within 30 minutes, it is covered by a layer of proteins precipitated from the saliva (Macphee&Cowley 1975). This is known as the acquired pellicle and normally coats all surfaces of the mouth. Within two hours microorganisms, mostly streptococci become absorbed onto the pellicle. From about one week onwards, filamentous forms appear and by two weeks they dominate the plaque structure (Marsh, 1980).

2.9.3 Dental Calculus

This firm of plaque, if allowed to remain on the tooth surface, matures and becomes mineralized. This hardened form is what is referred to as calculus which is commonly known as tartar. Dental calculus is simply defined as a calcified mass which adheres to the tooth surface. Dental investigators believe that calculus is the result of calcification of plaque. The two basic theories of formation and deposition are the physical – chemical theory and the epitactic theory. The physical–chemical theory believe that calcium and phosphate salts precipitates directly from the saliva because of an alteration in pH level of the salvia. The mechanism involves the loss of

carbonic acid, in the form of carbon-dioxide from saliva as it enters the oral cavity and contacts the air being breathed. This decrease of carbonic acid increases the pH of the saliva to a state of alkalinity. This mineral salts, calcium and phosphate then become less soluble in the alkaline pH precipitate out of solution and adhere to the plaque matrix.

The epitaxial theory centres on the nucleation and growth of calcium phosphate crystals within the bacteria matrix. Mucopolysaccharides, which are among the organic components formed by the plaque microorganisms, are believed to play a primary role in initiating this crystallization. (Sherry, 1975)

2.9.4 Materia Alba

This is another type of deposit found within the oral cavity. Although it is sometimes mistaken for food debris, it is a substance containing many more components; it is a mixture of salivary proteins, bacterial masses, desquamated epithelial cells and disintegrated leukocytes, incorporated with partially digested food particles. Material alba accumulates in areas not cleansed and in open inter-dental spaces. Teeth that are malpositioned or not in occlusion provide sites of rapid accumulation. Material alba appears to be loosely attached to the teeth and usually can be flushed out when the mouth is rinsed vigorously. (Sherry, 1975)

2.9.5 Dental Stains

This is a discoloration of the teeth which is frequently observed in the oral cavity. Though, it is a clear fact that most discoloration of the teeth is directly related to poor oral hygiene. But there are some discolorations which are not found to be associated with hygiene conditions. The two types of stains are classified as Extrinsic and Intrinsic stains.

Extrinsic Stains: Extrinsic stains are external to the tooth substances and are easily removable by brushing. Some extrinsic stains may also be classified as exogenous. These stains originate from outside the tooth but become incorporated into the tooth structure, making them irremovable. An example is tobacco stain which has become deeply engrained in the cemented surface.

Intrinsic Stains: This discoloration occurs from within the tooth substance. These are not removable during prophylaxis. Stains within this category are caused by blood pigment, decomposing pulp tissue, or developmental disturbances. Intrinsic stains are sometimes referred to as endogenous. Endogenous stains always originate internally and are associated with oral hygiene. Unlike exogenous stains which originate externally.

2.9.6 Bad Breath (Halitosis)

Bad breath also known as halitosis is a term that describes the unpleasant smell from the mouth. The millions of bacteria that cling to the corrugated part of the tongue particularly on the back side are the cause of unpleasant smell. Other causes are poor oral hygiene, infection in the mouth, Respiratory tract infection, Xerostomia (dry mouth).

Diagnosis

The dentist will review your history for medical conditions that can cause bad breath. The diet of the individual and personal habit like smoking, chewing tobacco is also reviewed. The dentist will examine the teeth, gums oral tissues and salivary gland. He also evaluates your breath when you exhale from the nose and mouth. If systemic problem are caused of your bad

breath, you may be referred to your physician. In cases of gum diseases you may be referred to a periodontist. A diagnostic test may be necessary if the doctor suspects a lung infection, diabetes, kidneys disease and liver disease, depending on the suspected illness, these tests may include blood tests, urine tests, X-ray of the chest or sinuses.

Prevention

Bad breath that is caused by systemic illness may be a long-term problem that can be controlled by proper medical care. Bad breath caused by dental problems can be corrected by good oral hygiene and regular visit to the dentist, American Dental Association (ADA 2007).

2.9.7. Gum Diseases

Periodontal disease, including gingivitis and periodontitis are serious infections of the gum that can even cause tooth loss due to damage on the tissue that surround the teeth if it is not treated on time. Periodontal means “around the tooth.”The infection starts when the bacteria in the sticky colourless film that constantly forms on the teeth (plaque) causes the gum to become inflamed. Plaque is known to be the primary cause of the gum disease.

- **Gingivitis**

Gingivitis is generally known to be the mildest form of periodontal disease: It causes the gums to be red, inflamed and also makes it to bleed easily. (AAP,2011) When gingivitis is not treated, it progresses to periodontitis. In individuals suffering from this condition, the inner layer of the gums and bone pull away from teeth and then form pockets. It is these small spaces between the teeth and gum that collect debris and become infected. The immune system of the individual helps in fighting the bacteria as the plaque spreads and grows below the gum line.

The poisons produced by the bacteria in plague and the body's enzymes involved in fighting infection starts to break down the bone and the connective tissue that is holding the teeth in place. As the disease advances, the pockets get deeper and more gum tissue and bones are damaged. When this occurs, teeth are no longer held in place, they become loosed and consequently lead to tooth loss (Taylor 2008).

Forms of Gingivitis

- **Non specific Acute Gingivitis:** This occurs in conjunction with common cold or influenza. It is characterized by redness and swelling with little discomfort but no actual pain and it resolves rapidly. Trauma could lead to a localized area of acute gingivitis. Such trauma results from using a very hard brush or masticating hard food particle or minor laceration or puncture by fish bone. Rapid healing occurs as soon as the cause is removed.(CROSS, 1980).

Acute Ulcerative Gingivitis

The condition is also known as Vincent's infection, trench mouth and acute necrotizing ulcerative gingivitis. It is highly common and is distributed worldwide. It is frequently seen in young individuals of both sexes. Although it is not often seen in young children, but has been reported in severely under nourished and very young children in Nigeria and India.

Signs and Symptoms: The patient complains of soreness, bleeding even at the slightest touch, bad breath and increased salivation. The presence of ulcers covered by grayish or yellowish slough may be revealed by examination involving the tips of interdental papillae and the gingival margins. The condition may be localized to one or two interdental areas or may involve the dentition entirely. It has been observed that ulcerative gingivitis is common among cigarette smokers. Stress is another factor that plays a significant role in developing ulcerative gingivitis and it is common in students preparing for exam. (Insufficient sleep).

Treatment: The use of oxygen – liberating substance has generally been known over the years and the use of peroxide or perborate mouth wash. It has also been discovered that rapid healing occurs when metronidazole is used – metronidazole is a drug originally used to combat vaginal infection with trichomonas. It is found to be equally effective in dealing with the organisms of Vincent Infection. It is administered in doses of 200mg 8 – hourly for 3 – days. The signs of pain and bleeding disappear within few hours. The drug is so effective that patients may consider themselves cured and will fail to continue treatment. High standards of oral hygiene should be maintained to avoid re-occurrence.

- **Acute Herpetic Gingivostomatitis.**

It is characterized by herpes simplex virus and occurs mostly in infants and young children. It also affects adolescent and adults. The indication is a diffuse redness of the gingiva or oral mucosa; cheeks, palate, lips, tongue and floor of the mouth. Small grey vesicles occur which rapidly breakdown to leave ulcers round in shape, surrounded by a raised red margin. The depressed floor is yellowish and the areas are very painful and bleeding may occur.

- **Treatment**

Tetracycline mouth washes are helpful in early stages of infection, in order to control secondary infection. Infants and young children who may be pyrexia, rest on bed and plenty of bland fluid should be prescribed.

- **Acute Periodontal Abscess (Acute Localized Periodontitis)**

In most cases, trauma is considered to be the initiating factor in the development of this condition, such as a penetration into the periodontal ligament by a fish-bone, or pressure on the gingivae from an ill-fitting appliance. But such hardly happens and the abscess may just develop

through extension of infection in an existing periodontal pocket where you have wide pockets at the orifice, pus formed is likely to seep away readily, but if a pocket is narrow and deep, it is quite easy for it to become blocked coronally through oedema or calculus.(CROSS,1980).

Treatment

The best way to relief pain is by the dis-occlusion of the tooth involved by grinding the antagonist. If pus is present, it should be incised and drained. But if pus is not yet present, penicillin V 250 mg 6-hourly for 5 days may be prescribed. In addition the use of saline mouth-baths every few hours is very good.

- **Periodontitis**

Untreated gingivitis can progress to periodontitis with time; plaque can spread and grow below the gum line. The toxins produced by the bacteria in plaque irritate the gums. The poisons stimulate a chronic inflammatory response in which the body in essence turns on itself and the tissues and bone that support the teeth are broken down and destroyed. Gums separate or pull away from the teeth, forming pockets that become infected. As the disease advances, the pockets get deeper and more gum tissue and bone are destroyed. Most times this destructive process has very mild symptoms which eventually lead to tooth loss. (AAP,2011)

- **Forms of Periodontitis**

Aggressive Periodontitis:- It occurs in patients who are otherwise clinically healthy. The common features include rapid attachment loss and bone destruction and familial aggregation. Immune deficiencies and genetic link have been shown to be possible factors for all types of aggressive periodontitis.

Chronic Periodontitis: It results in inflammation within the supporting tissues of teeth, progressive attachment and bone loss. It is considered as the most frequently occurring form of

periodontitis and it is characterized by pocket formation and recession of the gingival. It is prevalent in adult, but can occur at any age. Progression of attachment loss usually occurs slowly but period of rapid progression can occur.(AAP, 2011)

Necrotizing periodontal disease: It is an infection characterized by necrosis of the gingival tissue, periodontal ligament and alveolar bone. These lesions are most commonly observed in individuals with system condition such as HIV infection, Malnutrition and immuno suppression. Thomson et al; (2008) stress, poor diet, smoking and viral infection are predisposing factors for acute necrotizing periodontal disease.

- **Causes of Gum Disease:** The primary cause of gum disease is plaque. However, other factors can contribute to periodontal disease as well. Such factors include hormonal changes such as those occurring during:

Pregnancy: During pregnancy, women who already have an existing chronic gingivitis face more problems because it becomes aggravated from the second or third month of pregnancy. Changes in blood-vessel permeability and an increased tendency to inflammation, resulting from the hormonal changes which are taken, give rise to a clinical picture of severe inflammation, marked oedema and gingival enlargement, and an increase in tooth mobility. Borges (2008) Hormonal changes during pregnancy can aggravate existing gingivitis, which typically worsens around the second month and reaches a peak in the eight month. Enlargement may be localized to give rise to the so-called pregnancy gum tumour which may enlarge sufficiently to become ulcerated during occlusion, and necessitate excision during pregnancy. Such tumours tend to disappear if untreated shortly after parturition. Removing deposits thoroughly and observing

proper oral hygiene will often lead to a disappearance of signs and symptoms even during pregnancy.

Puberty: At puberty, chronic marginal gingivitis may be accompanied by hormonal changes and in women who have taken the contraceptive pill for some years. But it is worth noting that where oral hygiene is properly observed, the condition does not occur.

Menopause: - Chronic desquamative gingivitis or gingivosis is usually seen in women at and after the time of menopause. It is characterized by the appearance of blotchy reddening and desquamation of the attached gingival, starting as blisters which rapidly burst. Women may also experience abnormal tastes and sensation such as salty, spicy, and acidic taste in the mouth. (Christenson et al; 2006). It is important to maintain a very high standard of oral hygiene because the disease is difficult to treat.

Monthly menstruation: Gingivitis could also be aggravated in some women few days before menstruation when the progesterone level is high. During the period of ovulation, gum inflammation may also occur.

- **Those At Higher Risk of Developing Gum Disease**

Diabetic patient: Diabetes is known to be a disease that affects the body's ability to use blood sugar; patients with this disease are at higher risk of developing gum infections including periodontal disease. According to American Dental Association, (ADA, 2006) approximately 16 million Americans have diabetes. However more than half has been diagnosed with the disease. These infections can impair the ability to process and utilize insulin which may cause your diabetes to be more difficult to control and your infection to be more severe than a non-diabetic. Diabetes is not only a risk factor for periodontal disease-periodontal disease itself can worsen diabetes and make it more difficult to control blood sugar (Lamster et al; 2008).

- **Predisposing factors for gum disease**

A number of factors may predispose an individual to periodontitis. Some of these factors are:

Poor Oral Hygiene: Failure to observe high standards of oral hygiene could predispose one to periodontitis because the buildup of plaque which causes the disease is as a result of poor oral hygiene. progress of gingivitis is usually slowed by removal of plaque and this can only be achieved through proper oral hygiene. Although vigorous brushing is unlikely to remove all deposits, but the extent of irritation can be minimized.

Diet: Some diet helps plaque to grow which can lead to gum infection. Soft carbohydrates rich food which clings to the tooth and plaque surface aids diffusion of nutrients into the plaque. Foods rich in sugar have the additional effect of being immediately available for synthesis into polysaccharide adhesive by bacteria.

Nutritional deficiency: Nutritional deficiencies may affect the gingival, the best known being swelling and bleeding associated with vitamin C deficiency (Scurvy). Eating citrus fruits high in vitamin c may be helpful for patients with periodontitis. (Amelia etal; 2007).

Mouth Breathing: Mouth breathing is often listed as a cause of periodontal disease Leek (1972). This will make the saliva in the mouth to dry thereby hindering the protection the mouth gets from saliva.

2.9.8 Baby Bottle Tooth Decay

This is when an infant or small child develops several cavities, usually on the front teeth. It occurs when children fall asleep with a bottle of milk, formula, juice or other sweet liquid in their mouth. It can also develop when children fall asleep while breast feeding. The sugars from

the liquid are left lingering on the baby's teeth. The bacteria in the mouth produce acids that attack teeth. To protect the child from developing baby bottle tooth decay. They should not:

- Go to bed with a bottle filled with milk, formula juice or sweetened drinks.
- Sleep at night at breast.
- Drink from a bottle throughout the day.

The child should start drinking from a cup at six months of age and be weaned from their bottle by one year of age. It is important to clean the baby's teeth after each feeding Burt and Pai (2001). Even breast fed children should have their gums and teeth wiped with clean washcloth or gauze pad following each feeding.

2.9.9 Medication and Oral Health

Medication can affect oral health because some lessen the flow of saliva which has a protective effect on teeth and gums. Other effects are: gingival hyperplasia, xerostomia, tooth discolouration, direct tooth damage and oral candidiasis. Most children who suffer chronic health problems may take some of these medications which eventually lead to oral problems.

- **Gingival Hyperplasia**

A common complication of dilatin therapy is the abnormal growth of gum tissue. Dilatin is an antiepileptic drug that is mostly prescribed. The risk of gingival hyperplasia is related to the concentration of the dose (Stinnett et al; 1987). Good oral hygiene is recommended to reduce the degree and severity of hyperplasia.

- **Xerostomia:** It is a term used to describe dry mouth. Drugs that cause xerostomia can increase the risk of dental caries (Kempe et al; 1982). Drugs that have potential for reducing saliva production are those agents with anticholinergic side effect, including tricyclic, anti-

depressants and certain phenothiazine antipsychotics. Patients may use artificial saliva products to promote saliva.

- **Direct Tooth Damage**

Evidence has shown that certain drug treatments for asthma may cause damage to the tooth in children. The PH of most of these drugs has less than 5.5 in powdered form. This is significant because tooth enamel begins to dissolve at a PH 5.5. Aerosol dosage forms have a PH that is significantly higher above 7.0. The PH of powdered or aerosol forms of corticosteroids (including fluticasone) and beta-agonist (including albuterol and terbutaline) differ significantly. These drugs may result in tooth erosion when used several times a day in the powdered form (O'Sullivan & Curzon 1988). It is therefore advised that the mouth should be rinsed after use and inhalation. Effects of aspirin on oral mucosa have also been reported (Derllinger& Livingstone 1998). Chewing of aspirin tablets can damage tooth enamel and dentin (Grace, Sarlani& Kaplan 2004).

- **Tooth Discolouration**

Tetracycline discolouration of the teeth is a well known complication of therapy in children. This drug can deposit in the dentin and enamel of developing teeth which cause a permanent discolouration of the teeth. Permanent teeth discolouration may also occur in children less than eight years old who use tetracycline. This drug should be avoided in this age group. This drug should also be avoided by pregnant women during the third trimester of pregnancy because discolouration of deciduous teeth can occur (Scopp&Kazandjian 1986). There were cases of tooth discolouration in children that was found to be associated with combination of amoxicillin and clavulantic acid (Garcia – Lopez et;al2001). Unlike tetracycline – related

irreversible damage discolouration secondary to amoxicillin-clavulanic acid is caused by deposits on the surface of the tooth and is not associated with internal alternations in the tooth.

Some other agent that cause staining of the teeth includes chlorhexidine oral rinse, liquid iron products and tobacco chlorhexide-oral rinse may cause tooth discolouration and staining of tongue and dentures. Tooth staining is dependent on the concentration of the chlorhexidine. Chewing sugar free gum for 20 minutes after the use of chlorhexidine oral rinse may decrease the amount of staining without any effect on the efficacy of chlorhexidine (Yankal&Memling 1992).

- **Oral Candidiasis**

Use of corticosteroid has been found to be associated with oral candidiasis resulting from corticosteroid-induced inhibition of normal host defenses. Patients who take nasal steroids, systemic steroid concurrently are more susceptible to oral candidiasis. Patients are therefore advised to rinse their mouth after the use of these products. Cases of candidiasis can be managed by reduction in steroid dose if treatment is required; however, nystatin suspension may be used (Hanania et al; 1995).

2.10 Summary

The chapter which reviewed literature related to the study, considered various aspects of dental health and diseases associated with poor dental hygiene. It is understood that plaque plays an important role in the initiation and progression of various dental problems like Dental Caries, Materiaalba, Dental Calculus, Gingivitis, Periodontitis etc. The importance of maintaining high standard of oral hygiene is therefore highlighted as it is the only measure for overcoming or preventing dental diseases. Proper brushing helps to remove plaque so that it does not build up to cause dental disease.

High sugar consumption is considered a risk factor for developing dental caries because dental caries is a chronic sugar dependent infectious disease. The longer sugar stays in the mouth and the more frequently sweets are eaten; the more opportunity acids have to form which eat away at tooth enamel. Although sweets may be less harmful if eaten with a main meal rather than between meals. It has been observed that children especially those whose parent are of higher socio-economic status record a high rate of dental caries. Children are the most susceptible to Dental Caries because sugar and sweet nibbling addiction is a characteristic of children more than adults. Moreover they have not been able to attached importance to oral hygiene because of their age or their physical and mental limitation and hence they need a specialized oral physiotherapy instruction.

The intervention is among primary schools pupils in order to create awareness and increase knowledge on how Nutrition plays an important role in oral health and healthy teeth. The knowledge of nutrition and dental health can help in selecting dentally sound food and making smart choices in every food group. Oral health education should be a life-long practice and incorporated into the school environment with the support of teachers and Parents.

CHAPTER THREE

3.0 RESEARCH METHODOLOGY

3.1 Introduction

The purpose of this study was to assess the knowledge, attitude and practice of dental health care among primary school pupils in Zaria. To achieve this, the research design, population of the study, sample and sampling techniques, instrumentation for data collection, procedure for data collection and methods of data analysis are described in this chapter

3.2 Research design.

The ex-post-facto research design was used for the study. It was considered suitable because the information required was within the subjects and was elicited by the research instrument.

3.3 Population of the Study

The population for this study consisted of pupils from public primary schools in Zaria and SabonGari Local Government Areas of Zaria. This included pupils from classes 3 – 6. There are 173 schools in Zaria and SabonGari LGAs. The total school enrolment for the two LGAs was 86001 pupils (KadunaStateUniversal Basic Education Board), Local Government Education Authority. Pupils Enrolment (2012).The population distribution of the pupils in the two (2) LGAs are shown in table 3.3.1

Table 1: Population Distribution of schools and pupils enrolment in public primary schools in Zaria and Sabon-Gari LGAs.

S/N	L.G.A	Total No of Schools	No of Pupils from classes 3-6
1.	Zaria Local Government Area	116	56,784
2.	SabonGariLocal Government Area	57	29,217
	Total	173	86,001

Source: Kaduna State Universal Basic Education Board (2012), Local Government Education Authority, Pupils Enrolment (2012) Zaria and SabonGari LGEAs.

3.4 Sample and Sampling Techniques

Stratified random sampling technique was used in this study. With this technique, all the 173 public primary schools in Zaria were stratified into Zaria and SabonGariLocal Government Areas. From the study population of eighty-six thousand and one pupils (86,001), a sample size of three hundred and eighty-two (382) was drawn for the study. This agrees with the position of Louis, Lawrence & Keith (2009) where a sample size of 382 is determined as appropriate for a population ranging from 50,000 – 100,000.

The common hat-draw method was used to select schools from each of the strata. The names of the schools were written in pieces of paper, squeezed and thrown into the hat and shaken to ensure proper shuffling before they were drawn.

According to Asika, (2000) and Ugodulunwa (2004), in the method of proportionate sampling, there is need to obtain a true representation of the parent population consisting of many strata, once the size of the sample is decided, then schools and subjects can be selected. To determine the number of schools and respondents for each stratum, Mukherjee (1975), Nworgu (1991), Bello and Ajayi (2000), opined ten percent (10%) of the sample to compute

specific number of schools and respondents for proportional representation. The statistical formular for proportional representation of schools and respondents is; $n_h = \frac{n}{N} N_h$

Where;

n_h = number of schools or subjects to be drawn per stratum.

n = total number of subject in a stratum in the case of number of schools per stratum / or total sample size for the study to determine subject.

N = total population size for study.

N_h = The ten percent (10%) of total sample size in the case of number of schools per stratum /or total subject or respondent per stratum.

Using thisformular for the computation, a total number of 25 schools were drawn from Zaria Local Government Area and 13 schools were drawn from SabonGariLocal Government Area. From these, 252 subjects and 130 subjects were selected from Zaria and SabonGari Local Government Area respectively.

Table: 2 Sample Distributions

S/N	L.G.A	Total No of Pupils from Classes 3-6	% in Population Per stratum	No of Sampled Primary Schools per Stratum	Sample representation consisting of 382 Subject
1.	SabonGari	29,217	33.97	13.0	130
2.	Zaria	56,784	66.03	25.2	252
3	Total	86,001	100.00	38.2	382

From the 25 schools that were drawn from Zaria local government, 23 schools had 10 selected respondents each and the remaining two (2) schools had eleven (11) respondents each. From these, two (2) respondents each was selected from classes 3 &4. Three (3) respondents each were selected from classes 5&6. The two schools with eleven (11) respondents each, had a selection of two (2) respondents from class three (3), and 3 respondents each from classes four, five and six (4,5&6) respectively. This made up for the 252 respondents that were selected from Zaria Local Government Area. This method applied to all the schools and classes in the 13 schools selected from Sabon-Gari Local Government Area, In selection of respondents from their classes the common hat draw method was used where (Yes) and (No) responses were written in pieces of paper for pupils to pick, boys and girls alike depending on the number of respondents that were needed. The above description agrees with Ekeh (2003), Razaq&Ajayi (2000), method of purposive sampling.

3.5 Instrumentation for Data Collection

The instrument that was used for data collection is a questionnaire that was developed by the researcher. The questionnaire was based on the 5-points Likert scale items for the respondents to select from. The scales and options are as follows:

Strong agree	(SA)	5 points
Agree	(A)	4 points
Undecided	(UD)	3 points
Disagree	(DA)	2 points
Strongly disagree	(SD)	1 point

The questionnaire was divided into 4 sections; A, B, C and. D

Section A contained demographic information of the pupils like Age, Sex and Class.

Section B contained items eliciting information on knowledge of dental health care among primary school pupils in Zaria and SabonGari local government areas.

Section C contained items eliciting information on attitude of dental health care among primary school pupils in Zaria and SabonGari local government areas.

Section D contained items eliciting information on practice of dental health care among primary school pupils in Zaria and SabonGari local government areas.

3.6 Validation of the instrument

Copies of the questionnaire were distributed to experts in the department of physical and health education in Ahmadu Bello University Zaria, to assess the content and face validity. Necessary corrections and modification were made and on the basis of these corrections, suggestions and modifications, the items were then restructured and a final draft of the questionnaire was then prepared for collection of data for the study.

3.7 Administration of questionnaire

A total number of 382 questionnaires were made available for the respondents. The administration was done with the help of research assistants (school teachers). The pupils responded to the items contained in the questionnaires inside their class rooms and returned them immediately. The 382 questionnaires were retrieved after administration but one got missing in the process of analysis left with 381.

3.8 Statistical analysis

Data collected was analyzed using the Statistical Package of Social Sciences (SPSS). Statistical procedure that was used for the analysis of variables included descriptive statistics of frequency and percentages for demographic characteristics of the respondent. Mean and standard

deviation were used to answer the research questions on **Knowledge, Attitude and Practice of Dental HealthCare**. The major hypothesis was tested with Pearson Product Moment Correlation Coefficient and the sub-hypotheses were tested with paired sample t-test respectively. All the hypotheses were tested at 0.05 level of significance.

CHAPTER FOUR

4.0 RESULTS AND DISCUSSION

4.1 Introduction

The purpose of this study was to assess the knowledge, attitude and practice of dental health care among primary school pupils in Zaria and Sabon-Gari Local Government Areas of Kaduna State. To achieve this, data were collected and analyzed using the SPSS version. The mean score for the minimum level of agreement is 3.50, based on the five point LikertScale used in the study.

4.2 Results: The results of the study are presented in tables. A total of 382 questionnaires were administered among the subjects, 381 questionnaires were retrieved which represents 99.9% of the total sample size which was used for the study. The data was presented according to the research questions and hypotheses raised for the study and the demographic characteristics of the subjects has been presented in table 4.2.1

Table 4.2.1 Demographic Characteristic of the Respondents

Variables	Frequency	Percent %
Classes		
Primary 3	74	19.4

Primary 4	78	20.5
Primary 5	117	30.7
Primary 6	111	29.1
Total	380	99.7
No response	1	0.3
Total	381	100.0
Sex		
Male	183	48.0
Female	195	51.2
No response	3	0.8
Total	381	100.0
Age		
8-9	37	9.7
10-11 years	120	31.5
12-13 years	160	42.0
14-15 years	54	14.2
16 & above	9	2.4
No response	1	0.3
Total	381	100.0

Table 4.2.1 showed demographic characteristics of the subjects. An observation of the table showed that 74(19.4%) were primary three pupils, 78(20.5%) were primary four pupils and 117(30.7%) were primary five pupils while 111(29.1%) were primary six pupils. Majority of the respondents were in classes five and six, this was because this age groups are considered to have acquired more information on dental health care that is capable of influencing behaviour in various waysthan the lower classes so three (3) respondents each were selected from classes five and six purposively and two (2) respondents each from classes three and four(3&4) .

The table also showed that 183(48.0%) of the respondents were males while 195(51.2%) were females.

The age distribution of the respondents further revealed that 39(9.7%) were between the ages of 8 and 9years, 120(31.5%) were between the ages 10 and 11years, 160(42.0%) were between the

ages of 12 and 13years and 54(14.2%) were between the ages of 14 and 15years while 9(2.4%) were above 16 years

A representation in Figures 1-3 of the respondents by class, sex and age are shown below.

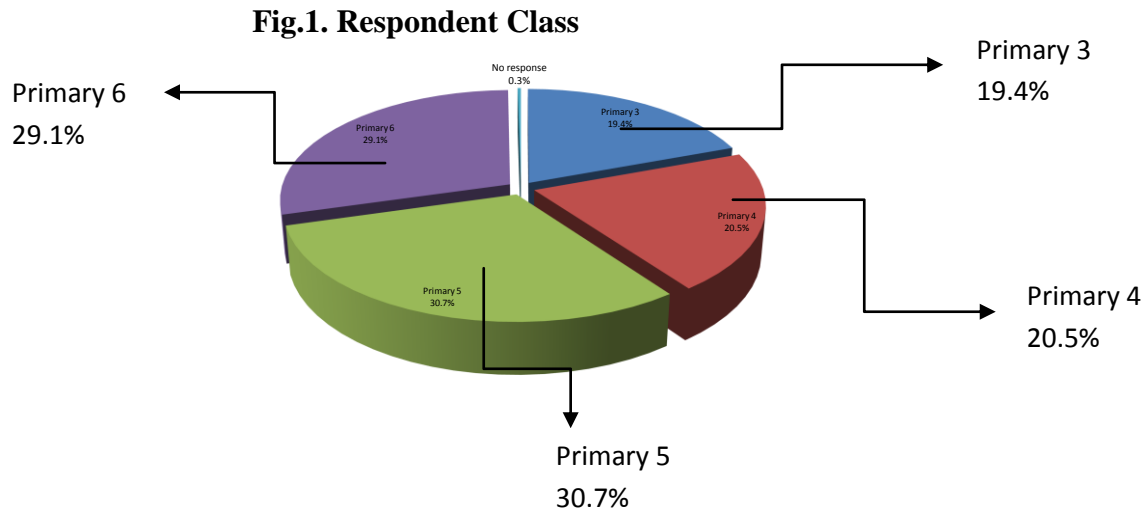


Fig.2. Respondent Sex

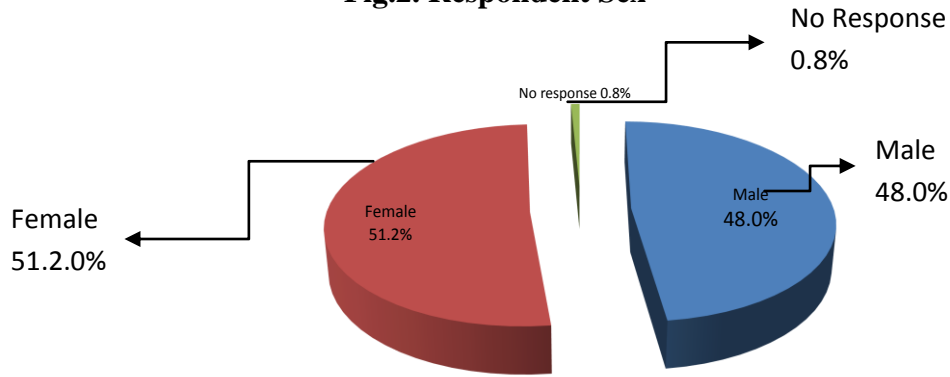


Fig. 3. Respondent Age

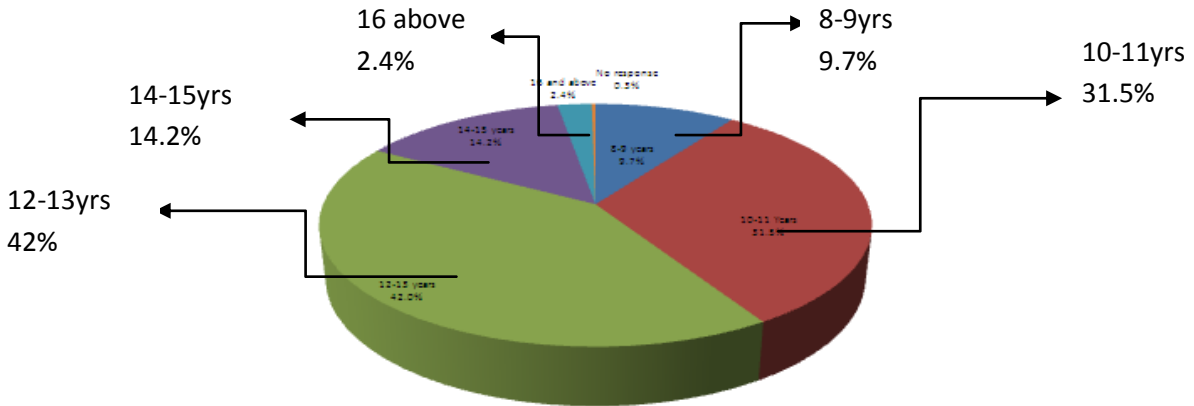


TABLE 4.2.2 Knowledge of Dental Health Care among Primary School Pupils.

S/N	Item	Mean	Std. deviation	Std. error of mean
1.	Failure to clean my mouth causes bad breath and mouth odour.	1.4619	0.60415	0.03095
2.	Failure to clean my teeth makes the colour of my teeth to change from white to yellowish grey.	2.0184	0.57324	0.02937
3.	Failure to clean my teeth regularly causes tooth decay	2.3289	0.77201	0.03960
4.	Regular cleaning of my teeth can prevent gum bleeding.	2.5459	0.74771	0.03831
5.	Vitamin C in take is good for the health of your gums	2.4987	0.72047	0.03691
6.	Licking of sweet and sugary substances can cause dental caries	2.3648	0.85269	0.04368
7.	Loss of teeth can make me unable to chew food properly.	1.7034	0.56075	0.02873
8.	Proper cleaning of the mouth improves oral health	1.8688	0.46859	0.02401
9.	Dental disease can affect my health	1.9843	1.26689	0.06490
10.	Decayed or spoilt teeth can make teeth not to grow well.	2.3018	0.79850	0.04091

Aggregate mean score 2.1

The table 4.2.2 shows the mean, standard deviation and standard error of means of the respondents' knowledge of dental health care. Means are significant at 3.5. The results of the study showed that most primary school pupils did not know that poor oral hygiene can cause mouth odour and other health problems. It further revealed that they are not aware that dental disease can affect their health and that good oral hygiene improves oral health. Generally, an observation of the table revealed that the pupils have poor knowledge about dental health care which was shown by the aggregate mean score of 2.1

Table 4.2.3 Attitude of Dental Health Care among Primary School Pupils.

S/N	Item	Mean	Std. deviation	Std. error of mean
1.	I believe the best way to maintain my dental health is to clean my mouth twice daily (morning and night)	2.2598	0.75616	0.03874
2.	I do not like to go for dental check up for fear of dental needle and pains.	2.7113	1.10768	0.05675
3.	I feel uncomfortable whenever I wake up and have not cleaned my mouth	1.9921	0.65086	0.03334
4.	I believe it is good to rinse my mouth after taking sweets and sugary substances.	2.4016	0.74966	0.03841
5.	I believe it is good to always change tooth brush at regular intervals.	2.3281	0.71817	0.03779
6.	I believe it is wrong to put dirty fingers inside the mouth to avoid germs.	1.9738	0.75696	0.03878
7.	Most times I feel tired about cleaning my teeth.	3.7769	1.06627	0.05463
8.	I believe that after waking up from sleep, I should clean up my mouth without having to be told.	1.9685	0.59299	0.03038
9.	I believe it is wrong to use my teeth to hold sharp objects.	1.6588	0.82660	0.04235
10.	I believe it is not good to share my tooth brush with another person.	1.8924	0.88939	0.04557

Aggregate mean score 2.3

Table 4.2.3 shows the means, standard deviation and standard error of mean of respondents' attitude towards dental health care. Means are significant at 3.5. The results of the study analysis showed that most of the primary school pupils did not like to go for dental checkup for fear of dental needle and also did not agree that cleaning their teeth twice daily (morning and night) is good for their dental health. The result further revealed that the pupils were comfortable whenever they woke up and have not cleaned their teeth and that they sometimes felt tired about cleaning their teeth. Furthermore, the results also revealed that the pupils did not agree that putting dirty fingers in the mouth is a wrong attitude. The aggregate

mean score is 2.3 which indicated that the primary school pupils have a poor attitude toward dental health care.

Table 4.2.4: Practice of Dental Health Care among Primary School Pupils

S/N	Item	Mean	Std. Deviation	Std. error of mean
1.	I clean my mouth every day with salt and ash	3.2940	1.21944	0.06247
2.	I clean my mouth twice daily (morning and night) to avoid dental health problems.	3.7927	0.89239	0.04572
3.	I use chewing sticks only to clean my mouth regularly.	3.4304	0.96710	0.04955
4.	I use tooth brush and tooth paste to clean my teeth regularly.	1.9974	0.81272	0.04164
5.	I only use finger and water to clean my teeth regularly.	3.6824	0.88641	0.04541
6.	I clean my teeth in upward and downward strokes daily.	2.6010	0.82615	0.04232
7.	I clean my tongue properly to ensure good breath.	2.1575	0.78565	0.04025
8.	My parents always inspect my teeth to see if it is clean	3.2913	1.27595	0.06537
9.	My class teacher inspect my teeth to see if it is clean	3.2073	1.38281	0.07084
10.	My parent takes me to the dentist at least once a year.	4.5354	0.93016	0.04765

Aggregate mean score 3.2

The table shows the means, standard deviation and standard error of mean of respondents' Practice of dental health care. Means are significant at 3.5. An observation of the table showed that the respondents use different methods as oral hygiene aids such as salt and ash, chewing sticks, finger and water. Only a small proportion of the respondents use tooth brush and paste. The pupils agreed that they clean twice daily but do not do it in and upward and downward strokes. It equally revealed that the use of finger and water was a dominant way of cleaning their teeth. School teachers and parents did inspect the pupils' teeth but may not be regularly. It however showed that parents took their children for dental visit.

Major Hypothesis: There is no significant relationship between Knowledge, Attitude and Practice of dental health care among primary school pupils in Zaria. The data collected on knowledge, Attitude and Practice of dental health care among primary school pupils was analyzed using the Pearson Product Moment Correlation coefficient in table 4.2.5

Table 4.2.5: Summary of the Correlation Coefficient between Knowledge, Attitude and Practice of dental health care among the pupils.

Variables	N	Mean	SD	r	Df	P
Knowledge	381	2.018	0.532	0.043	380	0.000
Attitude	381	2.259	0.756			
Knowledge	381	2.018	0.532	0.194	380	0.000
Practice	381	3.792	0.892			
Attitude	381	2.259	0.532	0.164	380	0.000
Practice	381	3.792	0.892			

$r(380)=0.195 \geq 0.05$

Table 4.2.5 shows the correlation coefficient (r) between knowledge and attitude, as 0.43, the correlation coefficient (r) between knowledge and practice as 0.194 and the correlation coefficient (r) between attitude and practice as 0.164, each of the cases was found to be less than the critical value of 0.195 which implied that there was no significant relationship between knowledge, attitude and practice of dental health care among primary school pupils in Zaria. The null hypothesis which states that there is no significant relationship between knowledge, attitude and practice was therefore retained.

Sub-Hypothesis One: There is no significant difference between knowledge and attitude of dental health care among primary school pupils in Zaria.

Table 4.2.6: Paired sample test comparing Knowledge and Attitude of dental health care among primary school pupils.

Variables	N	Mean	Std. deviation	Df	t	P
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Knowledge	381	1.462	0.604	380	20.901	.000
Attitude	381	2.711	1.107	380		

t (380) 1.645, P ≤ 0.05

An observation of the results revealed that there is significant difference between knowledge and attitude of dental health care among the primary school pupils. ($t(380) = 20.901$, $P \leq 0.05$). Therefore the null hypothesis which states that there is no significant difference between knowledge and attitude of primary school pupils toward dental health care was rejected.

Sub-Hypothesis Two: There is no significant difference between knowledge and practice of dental health care among primary school pupils in Zaria and Sabon Gari Local government Areas of Kaduna State.

Table 4.2.7. The Paired sample test comparing Knowledge and Practice of Dental Health Care among Primary School Pupils in Zaria.

Variables	N	Mean	Std. deviation	Df	t	P
Knowledge	381	2.018	0.532	380	37.019	.000
Practice	381	3.792	0.892	380		

t (380) 1.645, P ≤ 0.05

The paired sample test analysis of the knowledge and practice of primary school pupils in Zaria on dental health care is shown in table 4.2.7. An observation of the results revealed that there is significant difference between knowledge and practice of dental health care among the primary school pupils. ($t(380) = 37.019$, $P \leq 0.05$). Therefore the null hypothesis was rejected.

Sub-Hypothesis Three: There is no significant difference between Attitude and Practice of dental health care among primary school pupils

The paired sample test was used to test the hypothesis. The result of the test is summarized in table 4.2.8.

Table 4.2.8. Paired sample test comparing Attitude and Practice of dental health care among primary school pupils

Variables	N	Mean	Std. deviation	Df	t	P
Attitude	381	2.259	0.756	380	6.611	.000
Practice	381	2.601	0.826	380		.000

t(380) 1.645, P≤0.05

Table 4.2.8 showed the paired sample test of Attitude and Practice of dental health care among primary school pupils. An observation of the table revealed that there is significant difference between Attitude and Practice of dental health care among primary school pupils. (t(380) = 6.611, P ≤ 0.05) Therefore the null hypothesis was rejected.

4.3 Discussion

The study assessed the Knowledge, Attitude and Practice of dental healthcare among primary school pupils in Zaria and Sabon Gari Local Government Areas of Kaduna State. The major hypothesis which states that, “There is no significant relationship between Knowledge, Attitude and Practice of dental health care among primary school pupils in Zaria” was tested with Pearson Product Moment Correlation Coefficient and it revealed that there was no significant relationship $0.043 < 0.195$, $0.194 < 0.195$, $0.164 < 0.195$. The null hypothesis was therefore retained. It suffices to say that the primary school pupils knowledge, attitude and practice of dental health care was below satisfactory level as evident in the aggregate mean score for knowledge and attitude. This could be attributed to poor oral health education in schools and

the failure of parents to teach their children/wards oral hygiene principles. According to Kompalli et al (2013), those who have assimilated and feel a sense of personal control over their oral health are more likely to develop good attitude and adopt self care. This finding is however in contrast with the findings of Saunders and Roberts (1997), on “Dental Attitude, Knowledge and health Practices of parents of children with congenital heart disease”, where they found that knowledge of dental health practices was good among the children they conducted on. The pupils were not aware that regular cleaning of the teeth can prevent gum bleeding. According to Saunders & Roberts (1997). Bleeding gums are potentially harmful and that if gingivae bleed on brushing, it is necessary to brush more to encourage resolution of the gingivae inflammation. The pupils claim that they clean their mouth more than once daily but not with tooth paste and brush. It is believed that tooth brush and paste are more effective oral hygiene aids than chewing sticks, salt and ash because the oral cavity has a number space that are very small and narrow that even the bristles of the brush may not reach if not properly used. More so the oral condition of most of the pupils was bad as observed by the researcher during the administration of questionnaire. This could be as a result of irregular tooth cleaning habits, ineffective cleaning technique and inadequate time spent on cleaning. It was also possible that most of them do not clean up their teeth as they claim, however the most common practice has been the use of finger and water. In contrast, Tooth brush and tooth paste were the most commonly used oral hygiene aids as reported by Mehta & Kaur (2012) on their study on “Oral health-related knowledge, attitude & practice among 12year-old school children in Panchukula”, India.

The study also revealed that the pupils have attitudinal problems regarding dental health care. This was further seen in the aggregate mean score (2.3) for attitude in table 4.2.3. The sub-hypothesis which states that, “There is no significant difference between Knowledge and Attitude

of dental health care among primary school pupils, was tested with paired sample t-test and revealed that there existed a significant difference between the two variables. It was therefore rejected. Pupils did not see anything wrong in using their teeth to hold sharp objects and are also comfortable whenever they are awake from sleep and have not brush their teeth. The pupil may actually be aware that dental visit is beneficial but for fear of dental needles and pains they did not like it and this attitude has become part of them which only good knowledge regarding dental health will help to change this attitude in them. Joshi et al. (2005) reported that most students (60%) experienced fear during the first dental visit and the main reason that hampered dental visit was fear of dental needle. This is also in line with the study conducted on "Oral health knowledge, Attitude and Practice among secondary school students in Kuching Sarawak by Cheah et al; (2009), where most of the students stated that regular dental visit was necessary but the data showed that only 24.4% of them had practiced it. It is also consistent with the study of Varenne, Peterson, & Ouataras (2006), on "Oral Health Behavior of Adult and children in urban and rural areas of BukinaFaso. This shows that the belief that something is good and beneficial may not always influence the practice. The pupils have not formed the habit of rinsing their mouth with water after taking sweets; probably they are not aware that sweets and other sugary snacks are harmful to their teeth. This also similar to the findings of Mehta & Kaur (2012)

The study revealed the practice of oral hygiene of the pupils. It was evident that the pupils perform tooth cleaning by the different methods of oral hygiene aids such as salt and ash, chewing sticks, finger and water. The test of the sub-hypothesis which states that, "There is no significant difference between Knowledge and Practice of dental health care among primary school pupils in Zaria," was tested with paired sample t-test, the result showed that there was a significant difference between the variables and the null hypothesis was therefore rejected.

The socio-economic status of the people could have probably been the reason for the use of other oral hygiene aids because to most of them, it is cheaper to afford chewing sticks, salt and ash, and finger and water are readily available. Tooth paste and brush were rarely used. They are not aware that tooth pastes especially the fluoridated ones are helpful in preventing tooth decay. This is in agreement with the study conducted by (Benoit et al. 2006). On “Oral health behavior of children and adults in urban and rural areas of Burkina Faso”. They found that tooth cleaning was mostly performed by use of chewing sticks and that the use of tooth paste was rare, particularly fluoridated tooth paste. Improper method of cleaning was found among the pupils since the result showed that they don't clean their tongue and they also do not observe downward and upward stroking method of cleaning their teeth. The study revealed also that parent and school teachers do not carry out a regular inspection of school children's teeth as expected. However, parents take their children for dental visit. This is in agreement with the findings of Barker and Horton (2008) in their study among the pre-school children in California showed that parents played a major role in influencing their children's health and access to care.

CHAPTER FIVE

SUMMARY, CONCLUSION, AND RECOMMENDATION

5.1 Summary

According to a poet laureate, Ogdeh Nash, ‘some pains are physical, some are mental, and the one that is both is dental’. Our dental health is of utmost importance to the overall body health that is why the practice of oral hygiene is not optional; it is a thing we must practice religiously to avoid dental problems. Parents must not shy away from the responsibility of teaching their children at an early stage in life on good oral hygiene and brushing techniques till they have the dexterity to do it themselves.

To achieve the purpose of the study which sought to assess the knowledge attitude and practice of dental health care among primary school pupils in Zaria and Sabon-Gari Local Government Areas of Kaduna State, a total number of thirty eight (38) schools were drawn from both local government areas. The sample size for the study was 382. A self-constructed questionnaire was used to collect the data from the respondents. At the end of the collection 381

questionnaire were returned. The test of the major hypothesis for the study showed that there was no significant relationship between knowledge, attitude and practice of dental health care among primary school pupils in Zaria.

5.2 Conclusion

On the basis of the findings of this study, the following conclusions were drawn.

1. Primary school pupils in Zaria and Sabon-Gari Local Government Areas of Kaduna state lacked some basic knowledge of dental health care.
2. The attitude of primary school pupils toward dental health care was poor as evident in the study.
3. Primary school pupils use different method of oral hygiene aids such as salt and ash, chewing sticks, finger and water.
4. Most teachers and parents did not carry out inspection of school children's teeth regularly.

5.3 Recommendations

Based on the findings of the study, the following recommendations were made;

1. Awareness on the importance of oral health needs to be enhanced among the school children in Zaria and Sabon- Gari Local Government Areas of Kaduna state.
2. School children should be encouraged to develop a positive attitude towards their oral health through regular health appraisal.
3. Parents should always endeavour to inspect their children's teeth to detect the onset of any dental problem whether tooth decay or discoloration and should also ensure that they do not engage in bad oral practices.

4. Parents should teach their children/wards proper brushing techniques and also they should encourage them to make healthy food choices.
5. Generally, the oral health knowledge, attitude and practice of the primary school pupils in Zaria and Sabon-Gari Local Government Areas of Kaduna State is below the satisfactory level and needs to be improved upon.

Recommendation for Further Study

There will be need to carry out a study on the effectiveness of the use of ash and salt as oral hygiene aids in rural areas.

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Appendix A: Questionnaire

**DEPARTMENT OF PHYSICAL AND HEALTH EDUCATION
FACULTY OF EDUCATION
AHMADU BELLO UNIVERSITY, ZARIA.**

Dear Respondent,

I am a Post graduate Student of the above named Department carrying out a research on “Knowledge, attitude and practice of dental health care among primary school pupils in Zaria and Sabon-Gari Local Government Areas of Kaduna state”. Please kindly read the attached questionnaire and provide the relevant responses for each item in each section to the best of your knowledge. Your opinion will be highly appreciated and all responses will be treated as confidential.

Thank you.

Signed

OlogunLilian
Researcher

Section A: Demographic characteristics of respondents.

Please place a tick (√) on any item which appeals to you.

Name of School: -----

Class: 3 () 4 () 5 () 6 ()

Sex: Male () Female ().

Age: (a) 8-9years () (b) 10-11years () (c) 12-13years ()
(d) 14-15 years ()

Sections B – D contains statements on knowledge, attitude and practice of dental health care of primary school pupils in Zaria and Sabon-Gari LGAs.

Instruction; please place a tick(√) in the column provided against each statement that best represent your feelings.

The keys to the options are provided below:

SA = Strongly Agree

A = Agree

UD = Undecided

D = Disagree

SD = Strongly Disagree

Section B: Knowledge of Primary School Pupils about Dental HealthCare.

S/N	Item	SA	A	U	DA	SD
1.	Failure to clean my mouth causes bad breath and mouth odour.					
2.	Failure to clean my teeth makes the colour of my teeth to change from white to yellowish grey					
3.	Failure to clean my teeth regularly causes tooth decay					
4.	Regular cleaning of my teeth can prevent gum bleeding.					
5.	Vitamin C in take is good for the health of your gums.					
6.	Licking of sweet and sugary substances can cause dental caries					
7.	Loss of teeth can make me unable to chew food properly.					
8	Proper cleaning of the mouth improves oral health					
9	Dental disease can affect my health.					
10	Decayed or spoilt teeth can make teeth not to grow well.					

SECTION C. Attitude of primary school pupils about dental health care

S/N	Item	SA	A	U	DA	SD
1	I believe the best way to maintain my dental health is to clean my mouth twice daily (morning and night)					
2	I do not like to go for dental check up for fear of dental needle and pains.					
3	I feel uncomfortable when ever I wake up and have not cleaned my mouth					
4	I believe it is good to rinse my mouth after taking sweets and sugary substances.					
5	I believe it is good to always change tooth brush at regular intervals.					
6	I believe it is wrong to put dirty fingers inside the mouth to avoid germs.					
7	Most times I feel tired about cleaning my teeth.					
8	I believe that after waking up from sleep, I should clean up my mouth without having to be told.					

9	I believe it is wrong to use my teeth to hold sharp objects.					
10	I believe it is not good to share my tooth brush with another person.					

SECTION D: Practice of Dental Health Care among Primary School

Pupils.

S/N	Item	SA	A	U	DA	SD
1.	I clean my mouth every day with salt and ash.					
2.	I clean my mouth twice daily (morning & night) to avoid dental health problems.					
3.	I use chewing sticks only to clean my mouth regularly.					
4.	I use tooth brush and tooth paste to clean my teeth regularly.					
5.	I only use finger and water to clean my teeth regularly.					
6.	I clean my teeth in an upward and downward strokes daily.					
7	I clean my tongue properly to ensure good breath.					
8	My parents always inspect my teeth to see if it is clean					
9	My class teacher inspect my teeth to see if it is clean					
10	My parent takes me to the dentist at least once a year.					

Appendix B: Introductory Letter

Appendix C: Table of Sampled Schools

SAMPLED SCHOOLS IN SABON GARI LOCAL GOVERNMENT AREA

S/NO	NAME OF SCHOOL	SAMPLED NO. OF PUPILS
1.	Kabama UBE	10
2.	Sakadadi UBE	10
3.	Kwangila LGEA	10
4.	LayinBomo UBE	10
5.	Mayanka UBE	10
6.	JushinWaye LGEA	10
7.	B.A.B. LGEA	10
8.	Bomo Model	10
9.	Chikaji Model	10
10.	Dogawara	10
11.	DogoBauchi Model	10
12.	G.R.A Model	10
13.	Iyan Bashir	10
Total	13	130

SAMPLED SCHOOLS IN ZARIA LOCAL GOVERNMENT AREA

S/NO.	NAMES OF SCHOOL	SAMPLED NO. OF PUPILS
1.	KofaKibo-UBE	10
2.	Isannabawa UBE	10
3.	KofanGayanLowcost LGEA	10
4.	KauranJuli LGEA	10
5.	Abdurahaman LGEA	10
6.	Abubakar Imam	10
7.	Ahmed Gyallesu	10
8.	Alu Dan Sidi	10
9.	Baba Ahmed Model	10
10.	Demonstration FCE	10
11.	DahiruKanti	10
12.	Justice Bashir Sambo	10
13.	GwarGwaje Police Barracks	10
14.	Dr. ShehuIdris LGEA	10
15.	Daniel Gowon LGEA	10
16.	SaniAdamu LGEA	10
17.	TsohoAbdulahi	11
18.	WaziriLawal LGEA	10
19.	Angwan Kaya LGEA	10
20.	SarkinJaafaru	10
21.	SarkinSambo LGEA	10
22.	DallatuSamaila	10
23.	AbabakarMaccido LGEA	10
24.	AMB. LawalSambo	10
25.	Staff School NuhuBamali LGEA	11

Total	25	252
Grand Total	38	382