KNOWLEDGE, ATTITUDE AND PRACTICES AMONG DIABETIC PATIENTS TOWARDS ORAL HEALTH AT KENYATTA NATIONAL HOSPITAL.

A COMMUNITY DENTISTRY RESEARCH PROJECT REPORT SUBMITTED AS PARTIAL FULFILMENT OF BACHELOR OF DENTAL SURGERY DEGREE IN THE UNIVERSITY OF NAIROBI.

RESEARCH DONE BY: NJANJA GITAHI
V28/8320/2003
LEVEL III
Declaration

I declare that this dissertation is my original work and has never been submitted to any other institution, for any other degree, diploma, or certificate.

Njanja Githahi

Date 13/11/06

APPROVAL

This research project has been submitted for the partial fulfillment of the award of a Bachelor in Dental Surgery with our approval as supervisors.

DR. LOISE GACHECE, BDS (NBI), MPH (NBI),

DEPARTMENT OF PERIODONTOLOGY, COMMUNITY AND PREVENTIVE DENTISTRY.
SCHOOL OF DENTAL SCIENCES
UNIVERSITY OF NAIROBI

Sign.......................... Date..........................

DR. E.A.O. DIMBA, BDS (NBI), PGD(BERGEN)

INTERNATIONAL HEALTH (BGO)
DEPARTMENT OF ORAL MAXILLOFACIAL SURGERY. ORAL MEDICINE AND ORAL PATHOLOGY
SCHOOL OF DENTAL SCIENCES,
UNIVERSITY OF NAIROBI

Sign.......................... Date 30/11/06
Dedications

To the most important people in my life;

THE GITAHIS- MY FAMILY, MY STRENGTH

Special dedication to B.Gitahi and J.Gachau-My parents
AKNOWLEDGEMENT

To the Almighty God for giving me the strength to undertake my study

Special thanks to my supervisors Dr. Dimba and Dr. Gachece for their contribution, knowledge and support

Gratitude to the Division of Community Dentistry for giving me the opportunity to compile this project.

Gratitude to my teachers from a young age- Dr. Mohammed, Dr. Ngugi and Dr. Eva Njenga

Special thanks to all my close friends who gave me a lot of inspiration especially Edwin Kagereki who assisted me restlessly in data analysis.
# TABLE OF CONTENTS

## CHAPTER ONE

| Title page | 1 |
| Declaration | 2 |
| Approval | 2 |
| Dedication | 3 |
| Acknowledgment | 4 |
| Table of contents | 5 |
| List of figures | 6 |

## CHAPTER TWO

| Abstract | 7 |
| Introduction | 8 |
| Literature review | 10 |
| Statement of the problem | 12 |
| Justification | 12 |
| Objectives | 13 |
| Hypothesis | 13 |
| Variables | |

## CHAPTER THREE

| Study Design | 14 |
| Study Population | 14 |
| Study Area | 14 |
| Sample size | 14 |
| Sampling Method | 15 |
| Data Collection Technique and Instrumentation | 15 |
| Inclusion Criteria | 15 |
| Exclusion Criteria | 15 |
| Minimizing Errors and Bias | 15 |
| Ethical consideration | 15 |
| Data Analysis and Presentation | 15 |

## CHAPTER FOUR

| Results | 17 |
| Discussion | 26 |
| Conclusion | 28 |
| Limitations | 28 |
| Recommendations | 28 |

## CHAPTER FIVE

| References | 29 |
| Appendix – Questionnaire | 31 |
LIST OF FIGURES

Figure 1: Age and sex distribution
Figure 2: Residence
Figure 3: Knowledge on definition of plaque
Figure 4: Plaque removal technique
Figure 5: Causes of bleeding gums
Figure 6: Prevention methods of tooth decay
Figure 7: Perceived conditions of gums and teeth
Figure 8: Frequency of tooth brushing
Figure 9: Frequency of dental check ups
Figure 10: Reason for last dental visit
ABSTRACT
Diabetes is the sixth leading cause of death in the world, and is associated with complications in multiple organ systems. Oral diseases, particularly those affecting the periodontium, are commonly encountered in diabetic patients. However with good oral hygiene practices these problems can be prevented.

The objective of this study was to assess the oral health knowledge, attitude and practices among diabetic patients.

It was a descriptive cross-sectional study aimed at determining the oral health knowledge, attitude, and practices among diabetic patients. It was conducted at the Kenyatta National Hospital diabetic clinic. A total of 84 patients were included in the study. A convenient sampling method was used to select the study population. Data collection was done by use of an interviewer administered structured questionnaire.

Analysis was done using SPSS Version 11.0 and presented by use of various graphs

RESULTS
The results indicated that 95% of the respondents had adequate knowledge regarding oral health and its relation to diabetes as a complication. About 65% had good attitude on oral health care but around only 30% carried out good oral hygiene practices.

CONCLUSION
From the results of this study, diabetic patients have good knowledge and attitude on oral health and its relation to diabetes but do not carry out good oral hygiene practices

RECOMMENDATIONS
There is need for programs that will enhance on how oral hygiene practices should be carried out. This includes tooth brushing and interdental cleaning methods
INTRODUCTION
Diabetes is a complex multisystemic hormonal and metabolic disorder characterized by absolute or relative deficiency of insulin and/or resistance to the metabolic action of insulin on target tissues. If uncontrolled, it results in widespread damage in different organ systems such as retinopathy and neuropathy (Garber 1998, Bell and Hockaday 1996). According to the WHO classification, there are two major types of diabetes, Type I (T1DM) or insulin dependent diabetes which is less common, and Type II (T2DM) or non insulin dependent diabetes which is the most common type (World Health Organisation, 1985).

The general signs and symptoms of Type I diabetes include polyuria, polydipsia and polyphagia. Type II diabetes is more insidious and less specific. Patients suffering from both types of diabetes are prone to severe and recurrent oral infections of bacterial or fungal origin, especially if they are poorly controlled. Other oral conditions frequently seen in diabetic patients include xerostomia, dysgeusia, sialosis, dental caries and periodontal disease (Manfredi et al 2004).

The World Health Organization has stated that despite great improvements in the oral health status of some populations across the world, oral health is a global problem. Dental disease is the most common ailment on the planet with over 5 billion suffering from its effects. It is especially prevalent in the underdeveloped areas of the world. Oral health is integral to general health and quality of life. Periodontal disease for example is a common complication of several systemic diseases such as diabetes. Diabetics are also at greater risk of other oral diseases that further complicates their overall health (Campus et al, 2005).

A recent study at Kenyatta National Hospital described the association between periodontal disease and treatment mode, age and duration of diabetes. Of the 86 respondents interviewed, 43 were diabetics and 43 were non diabetics all aged between 20 and 69 years. The results of this study indicated that diabetic patients were prone to suffer from more severe types of periodontal disease when compared to the non diabetic controls (Gakinya et al, 1997).

Knowledge, attitude and practices on oral health among diabetic patients are known to affect the severity and progression of oral diseases. According to a Nigerian study (Taiwo JO, 2000) majority of diabetic patients do not know that factors in diabetics that can contribute to oral ill health and most importantly quite a number of diabetics were not aware of the need for glyceamic control to prevent oral infections. The main aim of this study was to assess the oral health knowledge and attitude among diabetic patients and how this reflects on their practices. This project will contribute towards the assessment of oral health status in diabetic patients in the Kenyan society and to describe their awareness about oral health. Given that oral health is an established determinant of general health and quality of life (Petersen, 2003) and considering that nearly 120 million people around the world suffer from diabetes mellitus (WHO) there is a clear need of integration of oral health care into the overall care of diabetic patients. The perceived benefits are that it will be used as a baseline for further studies to be conducted.
The data will help increase the awareness on the need for knowledge on oral health among diabetic patients.
LITERATURE REVIEW

Diabetes mellitus, specifically type 2 diabetes, is one of the major public health issues facing the world in the 21st Century. The incidence of type 1 diabetes (T1DM) has increased slowly, while that of type 2 diabetes (T2DM) has increased explosively. The worldwide incidence of T2DM is likely to double by the year 2010 due in large part to changing lifestyles, longer life expectancy, and rapid growth of ethnic and racial populations that have high prevalence rates (Varon et al, 2000). There are an estimated 120 million people globally who have diabetes, and a large number are not aware they have the disease (Petersen, 2003).

The management of diabetes has always centered on the control of blood sugar through medication and appropriate nutritional intake. Preventing oral infection, as an adjunct in controlling blood sugar, has been given little attention. Given the high prevalence of preventable oral conditions such as tooth decay and periodontal disease among diabetics, oral health practices are expected to impact on prevention and control of these oral complications (Ofilada, EJM, 2000)

One of the major complications of diabetes is periodontal disease, a chronic infection of tissues supporting the teeth and a major cause of tooth loss. Adults with diabetes have both a higher prevalence of periodontal disease and more severe forms of the disease, contributing to impaired quality of life and substantial oral functional disability. CDC analyzed data from the Behavioral Risk Factor Surveillance System (BRFSS) surveys for 1999 and 2004 demonstrate the need to increase awareness and support for oral health care among adults with diabetes (Centers for Disease Control and Prevention , 2005).

Periodontitis is often associated with both T1DM and T2DM (Campus et al, 2005). A case-control study was designed to evaluate the possible association between non-insulin-dependent diabetes (T2DM) and clinical and microbiological periodontal disease among adult Sardinians.A total of 212 individuals participated in this study. All subjects were given a clinical periodontal examination. According to this Italian study, patients with type 2 diabetes undoubtedly have susceptibility for more severe periodontal disease.

Arrieta-Blanco and co-authors (2003) also describe similar findings in a study conducted in Spain in a diabetic population and a control based on 70 diabetic subjects and 74 non-diabetic controls. When a comparison was made of the following criteria: gingival status according to the Loe and Silness criterion, probe depth, loss of insertion, gingival recession, Community Periodontal Index of Need of Treatment and gingival biopsies, it was found that a statistically higher gingivitis index, loss of insertion and gingival recession in diabetic patients compared to the control population, the same not occurring with the probe depth. No significant differences in the CPITN according to the type of diabetes mellitus, metabolic control or disease duration. The biopsy study did not show significant changes in the gingiva of the diabetic patients compared to the control population. The study concluded that the gingivitis index was higher in the diabetic population, and that diabetic patients required more complex treatment.

A study done at the University of Ibadan, Nigeria on oral health needs of diabetic patients highlights the comparable oral health knowledge, attitude and practices of diabetic patients with the non-diabetic participants. Less than 50% of the subjects knew the cause of periodontal disease. Majority of diabetic patients did not know factors in diabetics that can
contribute to oral ill health and most importantly 53.9% of diabetics were not aware of the need for glyceamic control to prevent and control oral infections in diabetics (Taiwo JO, 2000).

Patients with diabetes appear to lack important knowledge about the oral health complications of their disease. The results of this survey did not indicate improved prevention behaviors among the subjects with diabetes compared with non-diabetic control subjects. (Paul A Moore et al 2000)

The role of good glycaemic control in prevention of oral disease has also been described by Ogunbodede EO, and co authors (2005). The oral health status of 65 metabolically controlled adult diabetic patients attending the Diabetes Clinic in a Nigerian centre was assessed or over 6 months and compared with that of 54 non-diabetic acting as controls. The study showed that the difference in periodontal status of the patients and control was not statistically significant. This study demonstrates that an understanding of the interactions between systemic diseases and oral health is imperative for physicians and dental practitioners. The need for early detection and closer linkages between the dental and medical professions in managing diabetic patients is emphasized.
STATEMENT OF THE PROBLEM
Diabetes is a systemic disease with oral manifestation as a long term complication. Many diabetic patients do not have the knowledge that they are at a greater risk of developing oral manifestation and that they can prevent them or minimize them by practicing good oral hygiene. Most of these patients present to the Dentist when the disease process has accelerated and not much can be done to reverse the process.

Knowledge on oral health and the risks of developing oral complications due decreased immunity especially with uncontrolled blood glucose levels would equip patients with the necessary information needed for good practices for prevention of dental caries and periodontal disease. Diabetic patients would then consult oral health workers for both preventive and curative services in good time thus minimizing related oral complications.

JUSTIFICATION
1. Data on the knowledge, attitude and practices among diabetics on oral health is low
2. To assess the knowledge, attitude and practices among diabetics on oral health
3. Information attained may be used by government policy formulators to create strategic plans on creating patient awareness on oral health
OBJECTIVES

Main objective
To describe the oral health knowledge, attitude and practices among diabetic patients visiting the Diabetic Clinic

Specific objectives
1. To access the knowledge diabetics have on oral disease as a complication in diabetes.
2. To access the attitude of diabetic patients towards their own oral health and if they take it as serious as other systemic complication.
3. To access oral hygiene practices of diabetic patients.
4. To relate knowledge on oral health problems with the onset of oral health complications.

HYPOTHESIS
Knowledge and attitude of diabetic patients affects their oral hygiene practices thus the outcome.

VARIABLES.

Socio-demographic factors
-age
-sex
-residence

Independent variables
Knowledge on oral complications
Attitude on oral complication

Dependent variables
Practice of oral hygiene
RESEARCH METHODOLOGY.

Study Design
This was a descriptive cross-sectional study.

Study population.
The population was diabetic patients attending the diabetic clinic at the Kenyatta National Hospital at the time the research was being conducted.

Study area
The area in which the study was conducted at Kenyatta National Hospital which is about 10 minutes away from the Central Business District. It is the major referral hospital in the country. The Hospital runs a diabetic clinic on Fridays from 9.00 am to 12.00 pm

Sample size

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

N- Sample size
Z- Z value according the confidence chosen
C- Confidence level
P- Prevalence

Using a confidence level of 95%, Z value of 1.960 and Prevalence of 7% in Kenya (CDC, 2000)

\[ N = \frac{1.960^2 \cdot 0.07 \cdot (1-0.07)}{(1-0.95)^2} \]

N=100
Sampling method
Convenient sampling method was used to select patients.

Data collection techniques and instruments
An interviewer administered questionnaire was used to collect data. The patients' personal details were taken which includes age, sex, occupation, residence and duration of diabetes. Information on Knowledge, attitude and practices among diabetic patients towards their oral health was collected.

INCLUSION CRITERIA
1. All diabetic patient attending diabetic clinic in KNH
2. All diabetic patients who have given informed consent.
3. Patients above 18 years of age

EXCLUSION CRITERIA
1. Patients below 18 years of age
2. patients who will not given informed consent
3. non-diabetic patients

Minimizing of errors and bias
1. The research assistants underwent brief training on how to go about data collection to ensure uniform data collection.

Ethical Consideration
1. Authority to conduct the research was sought from the KNH, UON Ethics and Standard Committee.
2. Permission from the institution where the research is being conducted was sought
3. Patient gave informed consent and those who refused to participate in the study were not treated differently.
4. Patients were treated with respect and equally without bias.
5. The information collected was treated with utmost confidentiality.

Data Analysis and Presentation
The data was analyzed by use of a computer using SPSS Version 11.0. The presentation of the data was in the graphs, and percentage of the sample size. This was done by the researcher.
RESULTS

The total number of study respondents was 84. Of these 40 (47.6%) were male whereas 44 (52.4%) were female.

The age ranged between 23-79 years. The mean age was 41-50 years. The age group 21-30 years had 2 (66.7%) males and 1 (33.3%) females; 31-40 years had 2 (50%) males and 2 (50%) females; 41-50 years had 15 (37.5%) males and 40 (62.5%) females; 51-60 years had 11 (47.5%) males and 12 (52.2%) females; those who were more than 60 years were 10 (76.9%) males and 13 (23.1%) females.

Figure 1
The number of respondents who lived in the urban area were 46 (55%) while those who lived in the rural area were 38 (45%). Almost all the respondents (78, 92.9%) thought their teeth were important to them; 5 (6%) thought that teeth were of no importance to them.
Knowledge on definition of plaque.

The respondents who thought plaque was food particles were 32(39%); 25(30.5%) thought it was a disease while 25(30%) did not know what it was.
Of the respondents 44(54.3%) thought plaque was removed by cleaning of teeth; 16(19.8%) did not know. The rest included; 15(18.5%) who thought plaque was removed by the dentist and 6(7%) by rinsing with water.

Figure 4

Figure 5
The respondents who thought bleeding gums was due to eating hard foods was 18(23.7%); 18(23.7) thought it was due to plaque present near gums; 3(3.9%) due to brushing; 14(18.4%) due to all of the above. 23(30.3%) did not know.

![prevention methods of tooth decay](image)

**Figure 6**

Most of the respondents 64 (78%) thought tooth decay could be prevented; 4 (4.9%) thought tooth decay could not be prevented while 14 (17.1%) did not know. Most of the respondents thought tooth decay is prevented by limiting amount of sugar used 30 (40.5%); 11 (14.9%) by use of fluoridated toothpastes and 21 (28%) by proper oral hygiene. Some respondents 3 (4.1%) thought it was all the above while 9 (12.2%) did not know.

A total of 55 (67.9%) respondents thought that tooth decay and gum disease were preventable. 3 (3.7%) thought that oral diseases were not preventable. 6 (7.4%) unsure while 17 (21%) did not know. Most of the diabetic patients' respondents 47 (59.5%) thought they were at a higher risk of developing oral diseases; 4 (5.1%) said they are not; 13 (16.5%) were unsure and 15 (19%) did not know if they were at a higher risk of developing tooth decay and gum disease.

Majority of respondents 47 (58%) said that tooth decay and gum disease were a complication of diabetes, 13 (16%) thought it was not; 7 (8.6%) did not know while 14 (17.3%) were unsure. However there was no statistically significance between knowledge on oral diseases being a complication of diabetes and oral hygiene practices (p-value = 0.497; $\chi^2 = 5.370$)
Majority of respondents 52(61.9%) said they experienced bad breath with only 30(36.6%) not experiencing bad breath. For those who experienced bad breath 44(71%) said it bothered them whereas 18(29%) were not bothered by bad breath. The highest number of respondents 61(72.6%) thought bad breath was due to lack of cleaning their teeth while lowest number of respondents 9(10.7%) did not know. The others: 32(38.1%) thought it was due to lack of cleaning teeth; 25(29.8%) due to dental caries while 22(26.2%) due to gum disease. 13(15.5%) thought it was due to old age.

**Perceived conditions of gum and teeth**

![Figure 7](image)

Half of the respondents 42(50%) described their gums and teeth as average; 22(26.2%) as good while 17(20.2%) as poor. Some of the patients 44(53.0%) said that during the past 12 months they had experienced pain or discomfort in their teeth and gums while 36(43.4%) said that they didn’t experience any pain or discomfort. 3(3.6%) were unsure.
Majority of the respondents 31(38.3%) brushed their teeth twice or more daily; 26(32.1%) said they brushed their teeth once daily while those who clean once a week were 9(11.1%) and 9(11.1%) cleaned 2-6 times a week; 3(3.7%) clean once a month while 3(3.7%) clean 2-3 times a month. A total of 70 (83.3%) respondents thought cleaning of teeth was important to them while 13(15.7%) thought that this was not important.

Most of them 72 (85.7%) clean their teeth using toothbrushes; 39(46.4%) used wooden tooth picks: 5(6%) plastic tooth picks; 8(9.5%) dental floss; 2(2.4%) Charcoal and 30(35.7%) used Chewstick/Mswaki. However there was statistical significance between oral hygiene practices and knowledge on oral health (p value=0.01 x²=0.45 206). Of the respondents 36 (44.4%) changed their tooth brushes after 3-4 months; 34(42%) when bristles bend; 2(2.5%) when the bristles are discolored and 2(2.5%) after one year. 7 (8.6%) did not know
Of the respondents 20 (25.3%) had been to a dentist more than 5 years ago: 9 (11.4%) in less than 6 months; 17 (21.5%) in 6-12 months, and 7 (8.9%) in Less than a year but less than 2 years. 8 (10.1%) in more than 2 yrs but less than 5 years and 18 (22.8%) had never received dental care. However, there was no statistically significance between how often they visit the dentist and knowledge of the diabetics on oral disease being a complication of diabetes (p-value=0.642; $x^2=12.490$).
Reason concerning their last dental visit for most respondents 40(61.5%) was because something was wrong - pain or troubles with the gum; 14(21.5%) for Consultation; 4(6.2%) said it was part of follow up treatment; 4(6.2%) didn’t know/didn’t remember. While3 (4.6%) went for routine follow-up/treatment. During their visits to the diabetic clinic 34(32%) patients said they receive information on oral health while37 (55.7%) said they did not; 10(12.3 %) said they received information sometimes.

Majority of the respondents 55(67.9%) thought that changing their oral hygiene practices would improve their oral health; 7(8.6%) thought that it could not; 9(11.1%) did not know while 10(12.3%) thought Maybe it can improve their lifestyle. Most of the diabetic patient 64(81%) felt oral health was important while about 2 (2.5%) thought it was not; 13(16.5%) felt it was important only at times.
DISCUSSION

The bulk of the respondents were from an urban background (29.8%). This could be attributed to the fact that the study was conducted in an urban set-up. Majority of the respondents fell within the age group 41-50 (47.6%). This may be attributed to the fact that most of the diabetic patients are usually diagnosed this age. At this age patients are more eager to take care of their health and so visit the diabetic clinic often.

On the knowledge on oral health, a number of patients seem to be aware of what causes tooth decay that is limiting of sugar intake (70.5%). Some mentioned the use of fluoridated toothpaste (8.4%) and some proper oral hygiene (4.9%). Though they had this knowledge, it did not reflect on their oral hygiene practices and attitude. In comparison to a study done in Nigeria, their was also good knowledge of on oral health and how to prevent disease such as tooth cleaning (Taiwo JO, 2000). This was due to the fact that patients received the information at the diabetic clinic but the efficiency of tooth brushing was the problem.

Majority of patients had their last visit to the dentist more than 5 years back (25.3%) and others had never been to a dentist (22.8%). This is contrary to a study done in Finland in which 63% of participants had attended a dental appointment within the last year (Karikoski A et al, 2002). This may be attributed to the higher socio-economic status and availability of dental health care readily unlike in Kenya.

Periodontitis is a major complication in diabetes. Knowledge on oral health relation to diabetes was assessed to find out if the respondents had this information and if it reflected on their attitude and practice towards oral health. Most of the respondents considered oral health as a complication of diabetes (58%) but expressed that they don't receive any information on oral health when they attend the diabetic clinic (45.7%) thus they don't pay much emphasis as other complications associated with diabetes. This lack of information to the diabetic patients and need for it could be compared to a study done in Finland (Karikoski A et al, 2002) the majority (92%) found it important that diabetes nurses take an active role in including oral health education as part of the counseling process.

In this study the most frequent reason for a dental visit was some sort of pain or trouble with teeth or gums (61.5%). In a study done in Finland (Karikoski A et al, 2002) the most frequent reason for a dental visit was a normal checkup (47%). The difference in the results can be attributed to the fact that yearly dental check-ups are not emphasized in Kenya. Being a developing country, oral health care is not affordable to most of the people.

In this study, it was noted that the patients felt that their teeth were very important to them (92.9%) and that cleaning of teeth was important to them (83.3%) and for those with bad breath (61.9%) it bothered them (71%) but still their practices on cleaning of their teeth did not reflect. Only a few of them cleaned their teeth twice or more a day (38.3%). This in comparison in a recent study among Finnish adults with diabetes. Twice-a-day brushing was reported by 50% of those surveyed (Syrrjälä A-MH et al, 1999). It is thought that though the respondents at Kenyatta National Hospital diabetic clinic had knowledge on oral health and that their teeth are important to them, most of them come from poor socio-economic status.
and thus getting basic needs is a problem and this making getting dental care they can afford almost impossible.

Among the respondents 67.95% thought that changing their oral hygiene practices would improve their oral health but the problem was how to go about it because they had other complications that they felt needed more urgent attention. Majority also had the knowledge that they were at higher risk of developing oral diseases (59.5%) and that oral disease were preventable (67.9%). Most of the respondents used a toothbrush (85.7%) and tooth paste to clean their teeth but teeth and gums problems were still a major issues. In comparison to a study done in Nigeria (Taiwo JO) habits of tooth cleaning either with toothbrush and paste or with chewing stick was entrenched in the participants. The teeth and gum problems maybe attributed to the tooth brushing techniques. The patients may be brushing but with minimal plaque elimination due to poor tooth brushing techniques.
CONCLUSION
1) Majority of the diabetic patients had knowledge on oral hygiene practices. They were aware of the causes of oral diseases and how they can be prevented. They also knew that there was a relationship between development of oral diseases due to diabetes and that they were at a higher risk of developing oral diseases.

2) Their attitude was good still not very enthusiastic. They wanted to have better oral hygiene but did not do much about it. Practice was the major setback for these patients to achieve good oral health.

3) Most of the patients did not carry out good oral hygiene practices and only visited the dentist when they were in a lot of pain and discomfort. They hardly went for yearly dental check-ups.

LIMITATIONS.
1. The sample size achieved was 84 due to time factor.
2. There was language barrier due to the different ethnic groups in Kenya and some of the respondents were not literate thus communication was a barrier in terms of the questions being asked
3. Financial constraints on the researcher.
4. Supervision of the data collection by the researcher was challenging because it interfered with clinical session time.

RECOMMENDATIONS
1. Continuous Educational Programs should be put in place especially in diabetic clinics to further enlighten diabetic patients on association of oral health with diabetes.
2. A similar study should be carried out with a larger sample group to attain a generalized picture on the knowledge, attitude and practices among diabetic patients on oral health
3. A study as to why these diabetic patients don’t practice good oral hygiene should be conducted.
REFERENCES

1. Iwamoto Y, Kawamura M, Fukuda S
   Comparison of health behavior and oral/medical conditions in non-insulin-dependent (type II) diabetics and non-diabetics

2. Thorstensson H, Hugoson A
   Periodontal disease experience in adult long-duration insulin-dependent diabetics
   1996 Mar;23(3 Pt 1):194-202

3. Ogunbodede EO, Fatusi OA, Akintomide A, Kolawole, Ajayi A
   Department of Preventive and Community Dentistry, Obafemi Awolowo University, Nigeria
   2005 Nov 15;6(4):75-84

   Diabetes and periodontal disease: a case-control study

5. Taiwo JO
   Oral health education needs of diabetic patients in Ibadan.
   2000 Sep-Dec;29(3-4):269-74.

   Oral health in rural South Africa type 2 diabetic patients
   (2006 Apr;36(2):111-2)

7. Center for Disease Control and Prevention (CDC)
   Dental visits among dentate adults with diabetes—United States, 1999 and 2004

8. Peterson PE.
   2003 Dec;31 Suppl 1:3-23

9. Peterson PE.
   Priorities for research for oral health in the 21st century—the approach of the WHO Global Oral Health Programme.
   2005 Jun;22(2):71-4

10. Center for Disease Control and Prevention (CDC)
Dental visits among dentate adults with diabetes—United States, 1999 and 2004

11. Siudikiene J, Maciulskiene V, Dobrovolskiene , Nedzelskiene I.
Oral hygiene in children with type I diabetes mellitus

Oral health status in a population of Nigerian diabetics
2005 Nov 15; 6(4):75-84.

13. Bull World Health Organ
The burden of dental disease
vol.83 no.9 Genebra sept 2005

14. Gakinya NM, Ngotho Bn, Kariuki HN, Kaimenyi JT
Periodontal health status of patients attending Diabetic Clinic at Kenyatta National Hospital, Nairobi, Kenya.

Diabetes and Oral health Promotion:A survey of disease Prevention Behaviours
QUESTIONNAIRE

KNOWLEDGE, ATTITUDE AND PRACTICE AMONG DIABETIC PATIENTS TOWARDS ORAL HEALTH AT KENYATTA NATIONAL HOSPITAL

REGISTRATION NUMBER
NAME
AGE
SEX
RESIDENCE: RURAL.. URBAN

1. Are your teeth important to you?
   Yes
   No

2. Is cleaning of teeth important to you?
   Yes
   No

3. Do you experience bad breath in the mouth?
   Yes
   No

4. If the answer is yes to no.3, Do it bother you having bad breath?
   Yes
   No

5. Bad Breath is caused by
   Lack of cleaning teeth
   Lack of cleaning tongue
   Dental caries
   Gum disease
   Old age
   I don’t know

6. Plaque is
   A disease
   Name of a tooth
   Food particles
   Don’t know

7. Plaque is removed by
   Going to the dentist
   Cleaning of ones teeth daily
   Rinsing the mouth with water
   Don’t know
8. Bleeding of gums is caused by
   - Eating hard foods. ❑
   - Plaque present near gums. ❑
   - All the above. ❑
   - I don’t know. ❑

9. During the past 12 months did your teeth or mouth cause any pain or discomfort?
   - Yes. ❑
   - No. ❑
   - Don’t know. ❑
   - No answer. ❑

10. How would you describe the state of your teeth and gums? Is it "excellent", "very good", "good", "average", poor or "very poor"?

<table>
<thead>
<tr>
<th>Teeth</th>
<th>Gums</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good</td>
<td></td>
</tr>
<tr>
<td>Average</td>
<td></td>
</tr>
<tr>
<td>Poor</td>
<td></td>
</tr>
</tbody>
</table>

11. How often do you clean your teeth?

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td></td>
</tr>
<tr>
<td>Once a month</td>
<td></td>
</tr>
<tr>
<td>2-3 times a month</td>
<td></td>
</tr>
<tr>
<td>Once a week</td>
<td></td>
</tr>
<tr>
<td>2-6 times a week</td>
<td></td>
</tr>
<tr>
<td>Once a day</td>
<td></td>
</tr>
<tr>
<td>Twice or more a day</td>
<td></td>
</tr>
</tbody>
</table>

12. Do you use any of the following to clean your teeth?
    (State each item)

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toothbrush.</td>
<td></td>
</tr>
<tr>
<td>Wooden toothpicks.</td>
<td></td>
</tr>
<tr>
<td>Plastic toothpicks?</td>
<td></td>
</tr>
<tr>
<td>Thread (dental floss)</td>
<td></td>
</tr>
<tr>
<td>Charcoal.</td>
<td></td>
</tr>
<tr>
<td>Chewstick/miswak.</td>
<td></td>
</tr>
<tr>
<td>Other.</td>
<td></td>
</tr>
</tbody>
</table>

[31]
13. If you use a toothbrush, do you use toothpaste?
   Yes ............................................
   No .........................................

14. Tooth decay is prevented by?
   Limiting the amount of sugar consumption ............................................
   Use of fluoride toothpaste ...........................................................
   Carrying out a proper oral hygiene ...............................................  
   All the above ..........................................................................
   Do not know ........................................................................

15. Can tooth decay be prevented?
   Yes .............................................................
   No .............................................................
   I don’t know ..................................................................

16. You should change your toothbrush
   After 3-4 months ..............................................................
   After one year ..............................................................
   When the bristles start to bend ........................................
   When the bristles are getting discoloured ........................
   Don’t know ..................................................................

17. How long is it since you last have seen a dentist?
   Less than 6 months ..........................................................
   6-12 months ..................................................................
   Less than 1 year, but less than 2 years ..............................
   More than 2 years, but less than 5 years .........................
      More than 5 years ......................................................
   Never received dental care ..............................................

18. What was the reason of your last visit to the dentist?
   Consultation/advise ..........................................................
   Something was wrong/pain or troubles with teeth or gums ....
   It was part of follow-up treatment ......................................
   Routine check-up/treatment .............................................
   Don’t know/don’t remember ...........................................

19. Is taking care of your oral health important to you?
   Yes  

20. Are oral diseases preventable?
Yes □
No □
Maybe □
I don’t know □

21. Are diabetic at a higher risk of developing oral diseases?
Yes □
No □
Maybe □
I don’t know □

22. Do you receive any information on oral health when you attend the diabetic clinic?
Yes □
No □
At times □

23. Do you consider oral disease a complication of diabetes?
Yes □
No □
Maybe □
I don’t know □

24. Do you think changing your oral hygiene practices can improve your lifestyle being a diabetic?
Yes □
No □
Maybe □
I don’t know □

THANK YOU!!