

**KNOWLEDGE, ATTITUDE AND PRACTICES OF TYPE TWO DIABETES
IN A RURAL COMMUNITY IN KARATINA- NYERI COUNTY**

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**A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR THE AWARD OF THE MASTER OF PUBLIC
HEALTH DEGREE OF THE UNIVERSITY OF NAIROBI.**

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DEDICATION

I dedicate this work to my loving mother-Julie Ruchugo

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I remain solely responsible for any shortcomings in this work.

TABLE OF CONTENTS

| | |
|---|------------|
| DECLARATION | ii |
| APPROVAL | iii |
| DEDICATION | iv |
| ACKNOWLEDGEMENTS | v |
| TABLE OF CONTENTS | vi |
| LIST OF TABLES | ix |
| LIST OF FIGURES | x |
| LIST OF ABBREVIATIONS/ ACRONYMS | xi |
| DEFINITION OF OPERATIONAL TERMS | xii |
| ABSTRACT | xiv |
| | |
| CHAPTER ONE INTRODUCTION | 1 |
| 1.1 Diabetes in Kenya | 4 |
| | |
| CHAPTER TWO LITERATURE REVIEW | 7 |
| 2.1 What is diabetes? | 7 |
| 2.1.1 Diabetes complications | 8 |
| 2.1.2 Diabetes risk factors | 9 |
| 2.2 Diabetes: An emerging global threat | 10 |
| 2.2.1 Diabetes in Africa | 11 |
| 2.2.2 Expenditure | 12 |
| 2.2.3 What does it mean to live with diabetes | 13 |
| 2.3 Prevention of Diabetes | 13 |
| 2.3.1 Primary Prevention | 13 |
| 2.3.2 Secondary Prevention | 14 |
| 2.4 Diabetes Knowledge, Attitude and Practice in other parts of the world | 14 |
| 2.4.1 Diabetes Knowledge, Attitude and Practice in Kenya | 16 |
| 2.5 Diabetes Management | 16 |

| | | |
|----------------------|---------------------------------------|-----------|
| CHAPTER THREE | RESEARCH PROBLEM | 19 |
| 3.1 | Statement of the Problem | 19 |
| 3.2 | Conceptual Framework | 20 |
| 3.2.1 | Narration of the conceptual framework | 21 |
| 3.3 | Significance of the Study | 22 |
| 3.4 | Study Objectives | 23 |
| 3.4.1 | General Objective | 23 |
| 3.4.2 | Specific Objective | 23 |
| 3.5 | Hypothesis | 24 |
| | | |
| CHAPTER FOUR | METHODOLOGY | 25 |
| 4.0 | Introduction | 25 |
| 4.1 | Study Design | 25 |
| 4.1 | Study Site | 25 |
| 4.3 | Study Instruments and techniques | 25 |
| 4.4 | Study Population | 26 |
| 4.5 | Sampling Technique and Sample Size | 26 |
| 4.5.1 | Sample Size Determination | 26 |
| 4.5.2 | Sampling Method | 27 |
| 4.6 | Inclusion and Exclusion Criteria | 28 |
| 4.6.1 | Inclusion criteria | 28 |
| 4.6.2 | Exclusion criteria | 28 |
| 4.7 | Variables and their measurements | 28 |
| 4.8 | Data Collection Methods | 29 |
| 4.9 | Pre-Test | 30 |
| 4.10 | Reliability and Validity | 31 |
| 4.10.1 | Reliability | 31 |
| 4.10.2 | Validity | 31 |
| 4.11 | Minimization of Errors and Biases | 32 |
| 4.12 | Ethical considerations | 33 |

| | |
|--|-----------|
| 4.13 Study Limitations | 33 |
| CHAPTER FIVE RESULTS | 34 |
| 5.0 Introduction | 34 |
| 5.1 Demographic Characteristics | 34 |
| 5.2 Diabetes Knowledge..... | 39 |
| 5.3 Attitude..... | 42 |
| 5.4 Practices | 43 |
| 5.5 Analysis of relationships..... | 45 |
| 5.5.1 Relationship between Demographics Characteristics and Diabetes Knowledge | 45 |
| 5.5.2 Relationship between Demographics Characteristics (Independent variables) and Attitude..... | 47 |
| 5.5.3 Relationship between Demographics Characteristics and Practices..... | 50 |
| CHAPTER SIX DISCUSSION, CONCLUSION AND RECOMMENDATIONS | 52 |
| 6.1 Discussion | 52 |
| 6.2 Conclusion..... | 54 |
| 6.3 Recommendations | 55 |
| REFERENCES..... | 57 |
| APPENDICES | |
| Appendix 1: Approval letter by KNH/UON – ERC..... | 64 |
| Appendix 2: Research Participation Consent form (English Version)..... | 65 |
| Appendix 3: Research Participation Consent form (Kiswahili Version)..... | 67 |
| Appendix 4: Research Participation Consent form (Kikuyu Version)..... | 69 |
| Appendix 5: Survey Form (English Version)..... | 71 |
| Appendix 6: Survey Form (Kiswahili Version)..... | 80 |
| Appendix 7: Survey Form (Kikuyu Version)..... | 88 |
| Appendix 8: Informed consent form for both FGD and In-Depth Interview..... | 97 |
| Appendix 9: Focus Group Discussion Guide..... | 99 |
| Appendix 10: Key Informant Guide..... | 101 |

LIST OF TABLES

| | |
|--|----|
| Table 1: Sample Size..... | 27 |
| Table 2: Dependent and independent variables | 28 |
| Table 3: Gender distribution of the respondents | 34 |
| Table 4: Education level of the respondents..... | 35 |
| Table 5: Occupation and income of the respondents..... | 36 |
| Table 6: Age, marital status and parenthood status..... | 37 |
| Table 7: Diabetes status | 38 |
| Table 8: Knowledge of diabetes..... | 39 |
| Table 9: Causes, symptoms and complications of T2DM..... | 41 |
| Table 10: Attitudes of the respondents towards diabetes | 42 |
| Table 11: Practices in diabetes prevention..... | 44 |
| Table 12 (a): Cross tabulation analysis between demographic characteristics and diabetes knowledge..... | 46 |
| Table 12 (b): Logistic regression analysis between demographic characteristics and diabetes knowledge..... | 47 |
| Table 13 (a): Cross tabulation analysis of demographic characteristics against attitude..... | 48 |
| Table 13 (b): Logistic regression analysis of demographic characteristics against attitude | 49 |
| Table 14 (a): Cross tabulation analysis of demographic characteristics against practices..... | 50 |
| Table 14 (b): Logistic regression analysis of demographic characteristics against practices..... | 50 |

LIST OF FIGURES

| | |
|-------------------------------------|----|
| Figure 1: Conceptual Framework..... | 20 |
|-------------------------------------|----|

LIST OF ABBREVIATIONS/ ACRONYMS

| | |
|------|-------------------------------------|
| ADA | American Diabetes Association |
| BMI | Body Mass Index |
| DLF | Diabetes Leadership Forum |
| HIV | Human Immunodeficiency Virus |
| IDF | International Diabetes Federation |
| DF | Degrees of Freedom |
| NCDs | Non Communicable Diseases |
| NGOs | Non Governmental Organizations |
| SSA | Sub Saharan Africa |
| WHO | World Health Organization |
| FGDs | Focus Group Discussions |
| GoK | Government of Kenya |
| HIV | Human Immunodeficiency Virus |
| KDHS | Kenya Demographic and Health Survey |
| MoH | Ministry of Health |
| SD | Standard Deviation |
| SE | StandardError |

DEFINITIONS OF OPERATIONAL TERMS

Blood glucose - the amount of glucose (sugar) present in the blood of a human or animal. Normally, in mammals the body maintains the fasting blood glucose level at a reference range between about 3.9 and 5.6 mm (mmol/l). the american diabetes association recommends a fasting plasma glucose level of 3.9-7.2 mmol/l and after meals less than 10 mmol/l.

Blood glucose meter - a small, portable machine used by people with diabetes to check their blood glucose levels. After pricking the skin with a lancet, one places a drop of blood on a test strip in the machine. The meter (or monitor) soon displays the blood glucose level as a number on the meter's digital display

Blood glucose monitoring -checking blood glucose level on a regular basis in order to manage diabetes. A blood glucose meter (or blood glucose test strips that change color when touched by a blood sample) is needed for frequent blood glucose monitoring.

Blood pressure - the force of blood exerted on the inside walls of blood vessels. Blood pressure is expressed as a ratio (example: 120/80, read as "120 over 80"). The first number is the systolic pressure or the pressure when the heart pushes blood out into the arteries. The second number is the diastolic pressure or the pressure when the heart rests.

Blood vessels - tubes that carry blood to and from all parts of the body. The three main types of blood vessels are arteries, veins and capillaries.

BMI - body mass index - a measure of body fat that is the ratio of the weight of the body in kilograms to the square of its height in meters <a *body mass index* in adults of 25 to 29.9 is considered overweight, and 30 or more an indication of obesity.

Chronic - describes something that is long-lasting.

Complications - harmful effects of diabetes such as damage to the eyes, heart, blood vessels, nervous system, teeth and gums, feet and skin, or kidneys.

Diabetes management - dealing with short term events such as high and low blood sugar to controlling it over the long term such as by getting to grips with understanding the condition.

Glucose - a sugar that can be linked to form carbohydrates and that serves as a primary source of energy.

Glycaemic control - a medical term referring to the typical levels of blood sugar (glucose) in a person with diabetes mellitus.

Hyperglycaemia - excess of sugar in the blood.

Hypertension - abnormally high arterial blood pressure that is usually indicated by an adult systolic blood pressure of 140 mm hg or greater or a diastolic blood pressure of 90 mm hg or greater.

Macro vascular - pertaining to the macrovasculature, the portion of the vasculature of the body comprising the larger vessels, those with an internal diameter of more than 100 microns.

Microvascular - of, relating to, or constituting the part of the circulatory system made up of minute vessels (as venules or capillaries) that average less than 0.3 millimeters in diameter.

Nephropathy - an abnormal state of the kidney; especially one associated with or secondary to some other pathological process.

Neuropathy - an abnormal and usually degenerative state of the nervous system or nerves.

Non-communicable diseases (NCD) is a medical condition or disease that is by definition non-infectious and non-transmissible among people.

Retinopathy - any of various non-inflammatory disorders of the retina including some that cause blindness.

Socioeconomic status - socioeconomic status (ses) is the social standing of an individual or group in terms of their income, education and occupation. An individual's income, education and occupational status are often closely interrelated.

ABSTRACT

Background: Diabetes is a chronic, debilitating disease that requires life-long treatment and greatly increases the risk of serious long-term complications especially where poor management is concerned. This disease requires competent self management, which can be developed from a thorough understanding of the disease process by an individual.

It is believed that awareness of the early symptoms of diabetes is generally low, especially in a rural community, and this result in people with diabetes (known or unknown) to keep going to the clinics because of a complication rather than for routine consultation or follow up. Untreated diabetes leads to a number of serious long-term complications, including blindness, kidney disease, and neural vascular damage leading to foot ulcers and requiring amputation, as well as predisposing to heart attack, stroke and early death.

The impact of diabetes is further increased by its interrelationships with infectious diseases – people with diabetes are more likely to contract TB, and the second-line antiretroviral therapy treatment of choice for HIV in Africa has been linked with an increase in pre-diabetes, which already affects nearly 27 million people.

The limited availability of data on knowledge, attitude and practices of diabetes management in a rural community is one of the challenges to community responsive planning and policy making.

Objectives: This study aimed at assessing awareness levels, attitude and practices of a rural community towards diabetes.

Methodology: This study adopted a cross- sectional design using structured questionnaires as the main data collection tool. This questionnaire was made up of four sections ; section one, of the questionnaire covered the respondent's background information, section two examined awareness of diabetes disease, section three covered attitude and perceptions and lastly section four examined respondents practices in preventing and controlling diabetes. The study was conducted in Jambo Village in Karatina.

Analysis: A total number of 352 participants participated in the study in the months of May and June 2014. Data was analyzed using the statistical package for social sciences for Windows version 20.00 (SPSS). Descriptive statistics was applied to determine frequencies and the results are presented using tables.

Results: The mean age of study respondents was 38 years with the youngest respondents being 18 years and the oldest being 102 years. Almost half of the respondents had completed primary level of education, suggesting some level of literacy and agricultural activities was the bastion of this community. Majority of the respondents said they were not diabetic, and about a quarter said they have persons with diabetes in their households. Amongst those, that said they were diabetic, most were newly diagnosed (known diabetic for less than two years).

Also, majority of the respondents had limited knowledge of diabetes with almost half the number of respondents (43.7%) was unable to offer an elementary definition of the term diabetes, slightly more than half, (62.5%) thought that diabetes can be cured and an almost similar number (52.8%) did not know there is a genetic link. Further, 209 (59.4%) of the respondents did not know the cause(s) of diabetes, 195 (55.5%) did not know symptoms of diabetes and 324 (92.1%) did not know that if diabetes is not well managed it may eventually lead to some serious complications

Conclusion: Majority of the respondents had low to moderate awareness about diabetes despite citing it as one the key health issue in the community. However, this awareness has not led to any changes in the disease prevention because the respondents are not sufficiently equipped with the knowledge to comprehensively manage, prevent and control the disease

Recommendation: The government must take a lead in creating awareness about diabetes disease. In addition to developing the Kenya national diabetes educators' manual, a community awareness program targeting rural and semi-urban communities should be developed using a multi-sectoral approach in order to address the knowledge gaps and influence behaviour towards diabetes prevention.

Also, given the low and uncertain incomes characteristic among rural dwellers, free screening for chronic diseases should be availed to the residents to support early detection as well as increase knowledge level on diabetes status. This can be done in a similar manner to the ante natal care program targeting all government facilities right from level 2 health facilities.

1.0 Introduction

Chronic diseases are the largest cause of death in the world but are surprisingly neglected elements of the global-health agenda (Beaglehole *et al.*, 2007; Yach *et al.*, 2004). While sub-Saharan Africa is still fighting the affliction of infectious diseases, the increase in incidence of chronic or non-communicable diseases is alarming (Global Risks Report, World Economic Forum 2010).

The World Health Organization (WHO) projects that over the next ten years this region will experience the largest increase in death rates from cardiovascular disease, cancer, respiratory disease and diabetes. This is further supported by other studies that estimate by the year 2030 chronic disease mortalities will overtake infectious diseases in sub-Saharan Africa (Gustafsson-Wright *et al.*, 2010). A number of factors will contribute to this increase such as increased life expectancy, changing life style practices, poverty, urbanization and globalization (Aikins *et al.*, 2010).

Studies have shown, rise in chronic conditions or non-communicable diseases places long-term demands on health care systems because these conditions require ongoing management over many years (Bloom *et al.*, 2011; Suhrcke *et al.*, 2007; Yach *et al.*, 2004). From both an economic and a health perspective, this poses a particular threat to those countries whose systems are the least equipped to manage. Furthermore, the poorest individuals in those countries have the highest risk of developing chronic disease and are the least able to cope with them (Gustafsson-Wright *et al.*, 2010).

Of all non-communicable diseases, diabetes is associated with the highest co-morbidities and complications and affects people of diverse social-economic status. Every six seconds a person dies from diabetes and related conditions in the world and it killed as many as 5.1 million people in 2013 (International Diabetes Federation, 6th Edition Atlas 2013).

Diabetes is a chronic disease that occurs either when the pancreas does not produce enough insulin or when the body cannot effectively use the insulin it produces. Insulin is a hormone that regulates blood sugar. Hyper-glycaemia, or raised blood sugar, is a common effect of

uncontrolled diabetes and over time leads to serious damage to many of the body's systems, especially the nerves and blood vessels. Type I diabetes is characterized by deficient insulin production and requires daily administration of insulin. The cause of type I diabetes is not known and it is not preventable with current knowledge. Type II diabetes results from the body's ineffective use of insulin and it comprises 90% of people with diabetes around the world. It is largely the result of excess body weight and physical inactivity (WHO, 2010). Type two diabetes mellitus (T2DM) plays an important causal role in hypertension, upper body obesity, coronary heart disease, blindness and renal failure (WHO, 2010). It is also undoubtedly one of the most challenging health problems in the 21st century.

Diabetes is classified as a non-communicable disease (NCD). NCDs are chronic conditions that do not result from an acute infectious process. These conditions cause death, dysfunction, or impairment in the quality of life, and they usually develop over relatively long periods—at first without causing symptoms; but after disease manifestations develop, there may be a protracted period of impaired health (Bloom *et al.*, 2012).

Globally, it is estimated that there are about 382 million people or 8.3% of adults who have diabetes and about 80% live in low- and middle-income countries (IDF – Diabetes Atlas, 2013). The International Diabetes Federation (IDF) has predicted that there will be 522 million individuals with diabetes by 2030 and 599 million individuals by 2035 with a higher disease burden in low- and middle-income nations. In other literature it has been considered to be a pandemic killing 10,000 people every day (Diabetes Leadership Forum, 2010).

Diabetes was once considered a rare disease in sub-Saharan Africa, recent statistics from the International Diabetes Federation (IDF) in 2010, estimated over 12 million people in sub-Saharan Africa as having diabetes, and over 330,000 people will die from diabetes-related conditions (IDF – Diabetes Atlas, 2013).

Similarly, in other literature, it is predicted that sub-Saharan Africa over the next 20 years will have the highest growth in the number of people with diabetes than any other region in the world; researchers estimate that about 23.9 million by 2030 will have diabetes and this has been attributed to rapid urbanization, ageing population amongst other factors (Diabetes Leadership Forum, 2010).

Data on the condition of people with diabetes in sub-Saharan Africa and the complications of diabetes that they suffer is very scarce. All the same, it is estimated that at least, 4.51 million have eye complications, 2.23 million will need dialysis because of kidney damage, 907,500 have cardiovascular disease, 423,500 will be blind because of diabetes, 399,300 have cerebro-vascular disease and 169,400 will have lost a foot because of amputation (Diabetes Leadership Forum, 2010). This is attributed to poor prognosis for those undiagnosed which is generally much worse; hence the number of complications due to diabetes is expected to be much larger.

Despite growing evidence of epidemiological and economic impact, the global response to the problem remains inadequate (Yach *et al.*, 2004). NCDs have generally been marginalized within public health strategies and donor focus on infectious diseases has reinforced this tendency (Cooke, 2009). Addressing this imbalance requires building awareness and understanding of the threat of chronic diseases with the aim of galvanizing individual and national efforts.

Nevertheless, there is international political will to address the threat of diabetes; this has been expressed in December 2006 by the UN Resolution 61/225 that recognized that - diabetes is a chronic, debilitating and costly disease associated with severe complications, which poses severe risks for families (WHO-AFRO, 2010, World Diabetes Day-web site accessed on 29th Oct, 2014).

This study sought to evaluate the level of a rural community awareness of diabetes and how this knowledge influences their attitude and practices in prevention and control of the disease. The survey investigated the understanding of causes of diabetes, their recognition of signs and symptoms, treatment-seeking behaviors, community preventive measures and practices such as exercises and good diet. It is also intended to provide baseline information that can inform design of rural community based diabetes prevention and control interventions.

It is organized in six chapters, starting with chapter one that examines diabetes in Kenya, chapter two presents background information on diabetes as a disease, risk factors, prevention and its management as well as international experience in literature review. Research problem follows in chapter three and methodology in chapter four. Chapter five gives the results of the knowledge, attitude and practice (KAP) survey and finally chapter six is discussion, conclusion and recommendations. In addition to these, this dissertation also includes copy of the approval letter from KNH/ Ethics Committee, consent letters and research tools that were used in the study.

1.1 Diabetes in Kenya

Diabetes is increasingly common worldwide, and Kenya is no exception. Studies done in Nairobi have shown that 57% of admissions were as a result of non-communicable diseases and that 27.3% of these were as a result of diabetes (Njenga, 2009). The prevalence of diabetes in Kenya has been estimated to be about 3.8 % and is projected to raise 4.5% in 2025 (Karungu, 2010). According to diabetes management information center, prevalence has been shown to be 4.2% in the general population with a prevalence rate of 2.7% in the rural areas and as high as 10.7% in urban areas, while prevalence of glucose impaired tolerance is 8.8 % in the rural areas and 14.4% in the urban areas (Diabetes Management Information Center, 2014 Website, www.dmi.or.ke, accessed on 29th Oct, 2014).

In another local study, it is estimated that the prevalence of diabetes stands at 4.2% in the general population with a prevalence rate of 2.2% in the rural areas and as high as 12.2% in urban areas whilst, the prevalence of impaired glucose tolerance is equally high 8.6% in the rural population, and 13.2% in the urban population (Maina *et al.*, 2011).

According to World Health Organization in 2007, it was estimated that there were about 7 million people living with diabetes in Africa, of these an estimated 1.2 million were Kenyans, and if the trend continues, by 2025 that number is expected to rise to 1.5 million (4.5% of the population) (Maina,2007).

More recently, statistics published in the Kenya Economic Report for 2013 have shown that the prevalence of diabetes has grown from 3.3% of the population to 7.2 % over the last four years with the majority of those with diabetes are between 20 and 59 years (KIPRA, 2013).

According to literature, adaptation of urbanized lifestyle has contributed to a rise in levels of obesity and overweight in the population increasing the risk for diabetes (KIPRA, 2013; Maina *et al.*, 2011; Karungu, 2010). For instance, the 2003 Kenya Demographic and Health Survey about 20% of women and 7% of men in the country were overweight or obese. Recent studies have shown even higher figure of 60.3% and 19.5% for women and men respectively in urban areas as compared to 22.6% and 10% in women and men respectively in rural areas (Maina *et al.*, 2011).

Sadly, the majority of the people with diabetes in developing countries are within the productive age range of 45–64 years. These are the same individuals who are expected to drive the economic

engines of their countries in order to achieve the agreed international development goals (Maina *et al.*, 2011).

Both type 1 and type 2 diabetes (T1DM, T2DM) are on the rise in Kenya, as they are in other African countries (Maina, 2007; IDF, 2008). T2DM is the more prevalent, and Kenyans are developing it younger than others in developed countries (McFerran, 2008). The age of onset of T2DM in Kenya is between 45 and 55, compared with 64 years in developed countries (Mwangi *et al.*, 2011).

Kenyans are also at higher risk for crippling or life-threatening complications, because they report to health centers when the disease is advanced (Mwangi *et al.*, 2011). Care is further affected by the fact that health professionals are often not trained to address chronic diseases; there is a lack of interest on the part of health professionals because the disease is very demanding with few financial rewards; hospitals are overburdened; and there is a reliance on African traditional medicine (McFerran, 2008).

Treatment of T1DM and T2DM in Kenya, as in other parts of sub-Saharan Africa, is fraught with problems. Besides challenges related to diagnosis, care, and treatment, there is a lack of understanding and knowledge about the disease among healthcare professionals and the general population, and a perception that diabetes is not as critical as other diseases affecting the continent (Yach *et al.*, 2004; McFerran, 2008; Maina, 2010).

Reasons for the above include lack of up to date evidence related to the nature of the burden of the disease, strong beliefs that diabetes afflict only the affluent and the elderly, that this disease is as a result that freely acquired risk, and that control of it is ineffective and too expensive (Yach *et al.*, 2004). The other challenges include illiteracy due to lack of access to education; poor housing, poverty and also lack of investment in tackling diabetes as an emerging public health concern (Cooke, 2009).

In addition to the above, the high cost and low availability of insulin in Kenya (McFerran, 2008) with inadequate patient follow up (Beran, 2006) contribute to poor management (Azevedo, 2008). Although the Kenyan government subsidizes insulin to reduce price for patients, supplies frequently run out and there is miscommunication between local depositories and central medical stores to restock (McFerran, 2008).

There is a low level of public awareness and knowledge about diabetes in Kenya (Maina *et al*, 2011; GoK, 2010; McFerran, 2008). Local studies have shown that knowledge differs according to education and region; in addition most respondents have poor behaviours towards diabetes 41% show an unwillingness to adopt healthier lifestyles (Maina *et al*, 2011).

As the extent of diabetes is rising and increasingly contributing to morbidity and mortality, the country has a challenging health landscape leading to a double burden as communicable diseases is not fully addressed, data will be helpful in fighting this disease and developing tailor made interventions.

2.0 Introduction

This section reviews literature on diabetes as a public health challenge today by first reviewing the description of diabetes disease, its complications, risk factors, prevention and management, its impact globally and studies on knowledge, attitude and practice.

2.1 What is diabetes?

Diabetes is a chronic disease that occurs either when the pancreas does not produce enough insulin or when the body cannot effectively use the insulin it produces (WHO, 2010; IDF Atlas 2013). Insulin is a hormone that regulates blood sugar. Hyperglycaemia, or raised blood sugar, is a common effect of uncontrolled diabetes and over time leads to serious damage to many of the body's systems, especially the nerves and blood vessels (WHO, 2010; IDF Atlas 2013).

There are three types of diabetes, namely:

- Type 1 diabetes
- Type 2 diabetes
- Gestational diabetes

Type I diabetes (T1DM) is characterized by deficient insulin production and requires daily administration of insulin. The cause of type I diabetes is not known and it is not preventable with current knowledge. Type II diabetes (T2DM) results from the body's ineffective use of insulin and it comprises 90% of people with diabetes around the world. It is largely the result of excess body weight and physical inactivity (WHO, 2010).

Gestational diabetes mellitus (GDM) is, as the name suggests, diabetes that arises in pregnancy. It also reverts to metabolic and clinical normality post-partum, though relative risks of later T2DM is between 7- 13 times high in women with gestational diabetes compared to normo-glycaemic ones. Therefore, GDM must be distinguished from pre-existing diabetes in women who become pregnant. The particular importance of GDM is that it is associated with a poor pregnancy outcome, especially if unrecognized and untreated; particular adverse effects include, eclampsia, birth difficulties, intra-uterine growth retardation, foetal macrosomia,, neonatal hypoglycaemia and respiratory distress (WHO, 2010).

Other types or forms include diabetes as part of other Endocrine syndromes, drug induced diabetes, pancreatic disease and monogenic diabetes; previously referred to as maturity onset diabetes of the young (WHO, 2010).

Recently, researchers have identified impaired glucose tolerance (IGT) and impaired fasting glucose (IFG) as conditions closely linked to diabetes. This is a condition in which blood glucose levels are high but not as high as those in people with diabetes. IGT is defined as high blood glucose levels after eating; whereas IFG is defined as high blood glucose after a period of fasting. The term ‘prediabetes’ is also used to describe people with these conditions – a ‘grey area’ between normal glucose levels and diabetes (IDF, Atlas 2013)

2.1.1 Diabetes complications

People with diabetes are at risk of developing a number of disabling and life-threatening health problems. Studies have shown consistently that high blood glucose levels can lead to serious diseases affecting the heart and blood vessels, eyes, kidneys, and nerves (Watkins, 2003; Gross, 2005; McAlpine, 2005; Fowler, 2008; WHO, 2010).

People with diabetes are also at increased risk of developing infections (Pallavan, 2014). In almost all high-income countries, diabetes is a leading cause of cardiovascular disease, blindness, kidney failure, and lower-limb amputation (McAlpine, 2005; Fowler, 2008; WHO, 2010).

Potential associations between diabetes and important communicable diseases in the Sub Saharan Africa (SSA) region, particularly tuberculosis and Human Immuno Deficiency Virus (HIV), further complicate the pattern of increasing diabetes prevalence and the challenges posed on resource-constrained health systems. A link between diabetes and TB has long been recognized, and the steady increase in the number of people with diabetes is undermining global efforts to control TB. Diabetes increases the risk of contracting tuberculosis by raising infectivity, and it also reduces the response to treatment (Diabetes Leadership Forum, 2010).

T2DM has also been associated with a 25-75% increased risk of pneumonia and pneumococcal bacteraemia leading to hospitalisation, and longer duration of diabetes, diabetes complications, and poor long-term glycaemic control increases the risk. Diabetes increases the risk of developing severe sepsis, with one study reporting a 2.5 fold increased risk for hospitalization with sepsis in diabetic individuals compared to the general population. Patients with diabetes mellitus have a

two to three fold increased risk of bacteraemia and sepsis originating from the urinary tract compared with those without diabetes (Hall *et al.*, 2011).

The high rates of undiagnosed and uncontrolled diabetes recorded highlight the presence of significant barriers to accessing diagnosis and treatment. Given the reports that health centres lack the necessary diagnostic tools it is also likely that screening for diabetes is not routinely performed. Several important challenges to accessing diagnosis and treatment have been identified in literature: the high financial cost of treatment, particularly insulin; the limited availability of diagnostic tools, treatment and glucose monitoring equipment; and a low awareness of diabetes among healthcare professionals which was reported by some authors (Hall *et al.*, 2011).

2.1.2 Diabetes risk factors

A risk factor in health is any attribute, characteristic or exposure of an individual that increases the likelihood of developing a disease or injury for example underweight, overweight (WHO, 2014 www.who.int, accessed on 29th Oct, 2014.)

In another study, a health risk factor is defined as anything that increases one's chances of getting a disease. Common categories of risk factors include biological or physiological factors, behavioural factors, psychosocial factors, physical environment and social determinants of health (Baptiste-Roberts, 2007).

According to diabetes leadership forum, the following are some of the examples of risk factors for diabetes (Diabetes Leadership Forum, 2010).

- **Demographics:** People aged 45-59 years are 8.5 times more likely to develop diabetes than those aged 15-29 years; and those above the age of 60 are 12.5 times more likely to develop diabetes. Based on the present prevalence rates in sub-Saharan Africa, the demographic changes alone will account for an increase of 9.5 million people with diabetes between 2010 and 2030.
- **Obesity:** This is the excessive accumulation of fat especially in the abdomen (commonly referred to as the pot belly). Studies have shown that being overweight or obese massively increases the risk of diabetes. Body mass index indicates the medically acknowledged ranges of underweight, healthy weight, overweight and obesity. Data on the level of obesity in sub-Saharan Africa is scarce, but it varies between 3-44% of the population, depending on ethnicity and urban or rural location (Watkins, 2003).

- Poor dietary habits including ingestion of food that is rich in low density lipoprotein.

This is found in red meat, eggs, and dairy products. Refined starches as found in refined sugars (candy, cakes, etc.) are also associated with increased risk for type 2 diabetes (Baptiste-Roberts, 2007).

- Sedentary lifestyles: With urbanization and the busy office jobs, the tendency to inactivity has significantly risen. People ride vehicles to work, take lifts to their offices and spend hours seated.

- Secondary diabetes: That may result from medication administered by self or clinicians to treat other health conditions e.g. the use of steroids to treat rheumatoid arthritis.

2.2 Diabetes: An emerging global threat

Diabetes is believed to be the commonest and most devastating chronic disease in human history. It has afflicted mankind for thousands of years and continues to do so at an unprecedented rate (Tabish, 2007). However, many governments and public health planners remain largely unaware of the current magnitude of and future potential for increases in diabetes and its serious complications (McFerran, 2008).

Population-based diabetes studies consistently show that a substantial proportion of those found to have diabetes had not been previously diagnosed. Many people remain undiagnosed largely because there are few symptoms during the early years of type 2 diabetes, or those symptoms may not be recognised as being related to diabetes (IDF, 2013).

It is estimated that 382 million people worldwide, or 8.3% of adults, have diabetes. About 80% of these are in low- and middle-income countries. If these trends continue, by 2035, about 592 million people, or one adult in 10, will have diabetes. This equates to approximately three new cases every 10 seconds or almost 10 million per year. The largest increases will take place in the regions where developing economies are predominant. The majority of the 382 million people with diabetes are aged between 40 and 59 (IDF, 2013).

In gender lines, there are about 14 million more men than women with diabetes (198 million men vs 184 million women). However, this difference is expected to increase by 15 million (303 million men vs 288 million women) by 2035 (IDF, 2013). There are more people with diabetes living in urban (246 million) than in rural (136 million) areas although the numbers for rural areas are on the increase. In low- and middle-income countries, the number of people with diabetes in

urban areas is 181 million, while 122 million live in rural areas. By 2035, the difference is expected to widen, with 347 million people living in urban areas and 145 million in rural areas (IDF, 2013).

In addition to diabetes, impaired glucose tolerance (IGT), in which blood glucose levels are higher than normal but not as high as in diabetes, is also a major public health problem. People with IGT have a high risk of developing diabetes as well as an increased risk of cardiovascular disease (IDF, 2013).

About 316 million people worldwide, or 6.9% of adults, are estimated to have IGT. The vast majority (70%) of these people live in low- and middleincome countries. By 2035, the number of people with IGT is projected to increase to 471 million, or 8.0% of the adult population. The majority of adults with IGT are under the age of 50 (153 million) and, if left untreated, are at high risk of progressing to type 2 diabetes later in life (IDF, 2013). The prevalence of IGT is generally similar to that of diabetes, but somewhat higher in the Africa and Europe Regions and lower in the South-East Asia Region.

Estimating the number of deaths due to diabetes has been challenging because on the one hand, more than a third of countries do not have any data on diabetes-related mortality; and on the other, because existing routine health statistics underestimate the number of deaths due to diabetes. However, approximately 5.1 million people aged between 20 and 79 years died from diabetes in 2013, accounting for 8.4% of global all-cause mortality among people in this age group (IDF, 2013).

2.2.1 Diabetes in Africa

For generations, the healthcare agenda in sub-Saharan Africa has been dominated by poverty and infectious disease, such as malaria and HIV/AIDS (Cooke, 2009). With the transformation in lifestyles in both the sprawling urban centres and, increasingly, in rural areas, obesity and diabetes have become a new priority for health in the region (Cooke, 2009).

There are widespread indications in sub-Saharan Africa that as many as 85% of cases have not been diagnosed, although the rate of diagnosis is increasing. Estimates vary from 60% (Cameroon) 70% (Ghana), more than 80% (Tanzania), 85% (South Africa) to 100% in rural

Guinea ((Diabetes Leadership Forum, 2010). This makes the region have the highest proportions of undiagnosed diabetes (IDF, 2013).

An estimated 19.8 million adults Africa have diabetes – a regional prevalence of 4.9% with the highest prevalence of diabetes in island of Reunion 15.4%, followed by Seychelles 12.1%, Gabon 10.7% and Zimbabwe 9.7% (IDF, 2013). Some of Africa’s most populous countries have the highest numbers of people with diabetes, including: Nigeria 3.9 million, South Africa 2.6 million, Ethiopia 1.9 million, and the United Republic of Tanzania 1.7 million (IDF, 2013). An estimate of 522,600 people in the region died from diabetes-related causes in 2013, this represents 8.6% of deaths from all causes in adults, with about 76% of those deaths occurred in people under the age group of 60 years (IDF, 2013).

IDF estimates that 6,100 new cases of type 1 diabetes are diagnosed each year in children in sub-Saharan Africa, contributing to a total of 35,700 recorded cases in the whole region. But this may well also be an underestimate (IDF, 2010).

2.2.2 Expenditure

NCDs are financially debilitating for individuals and families, due to a combination of medical costs, costs of transportation to and from health services, time associated with informal care giving, and lost productivity. Deaths of women or men from NCDs during their most productive years (40-60 years) can result in tragedy for families and catastrophic expenditure (Cooke, 2009).

Diabetes imposes a large economic burden on individuals and families, national health systems, and countries. Health spending on diabetes accounted for 10.8% of total health expenditure worldwide in 2013 (IDF, 2013). Global health spending to treat diabetes and manage complications totalled at least USD 548 billion in 2013. By 2035, this number is projected to exceed USD 627 billion (IDF, 2013).

There is a large disparity in health spending on diabetes between regions and countries. Only 20% of global health expenditure on diabetes was made in low- and middle-income countries, where 80% of people with diabetes live. According to estimates for the Africa Region, at least USD 4 billion was spent on diabetes healthcare in 2013, and this spending is expected to increase by around 58% by 2035 (IDF, 2013). In the same period, the prevalence of diabetes is projected to almost double.

In a desktop review study of six sub-Saharan countries, it is estimated that the current cost burden for the treatment and management of diabetes and its complications stands at \$11,252 per person, of which 91.2% is due to complication costs (IDF, 2011).

2.2.3 What does it mean to live with diabetes?

Living with diabetes brings physical problems, including tiredness, thirst, frequent urination, and frequent infections; or palpitations, rapid respiration, excessive perspiration, difficulties in concentrating, confusion, dizziness and visual disorders. The stress involved in dealing with diabetes can often lead to mental issues such as depression, especially for young people with diabetes, so support from health professionals and family members is vital.

Those in rural area also face many practical and financial problems: the difficulty of reaching treatment centres; affording medicines for which they usually have to pay; and the problem for both patients and family carers of remaining in employment.

As diabetes in sub-Saharan Africa commonly presents during the peak income-earning period in an individual's life, those affected are often the breadwinners of their family. One in six patients said they could not work due to diabetes, and one in three said they could not work as much as they wanted to (Diabetes Leadership Forum, 2010).

One study revealed that 15% of family members had given up work to care for a family member with diabetes, and a further 20% had to cut back on work. The effect on the family exceeds pure economic costs especially in sub-Saharan Africa as it is often the family members who bear the primary responsibility for care (Presentation to IDF, 2009).

2.3 Prevention of Diabetes

2.3.1 Primary Prevention

Primary prevention identifies and protects individuals at risk from developing diabetes. It therefore has an impact by reducing both the need for diabetes care and the need to treat diabetes-related complications.

While there is yet no conclusive evidence to suggest that type 1 diabetes can be prevented, primary prevention of type 2 diabetes is potentially possible. Lifestyle changes aimed at weight

control and increased physical activity are important objectives in the prevention of type 2 diabetes. The benefits of reducing body weight and increasing physical activity are not confined to type 2 diabetes; they also play a role in reducing heart disease, high blood pressure amongst others (MOH, July 2010).

2.3.2 Secondary Prevention

This involves the early detection and prevention of complications, therefore reducing the need for treatment. Action taken early in the course of diabetes is more beneficial in terms of quality of life and is more cost-effective, especially if this action can prevent hospitalization.

There is now conclusive evidence that good control of blood glucose levels can substantially reduce the risk of developing complications and slow their progression in all types of diabetes. The management of high blood pressure and raised blood lipids (fats) is equally important (DPP, 2009).

The morbidity and mortality resulting from micro and macro vascular complications of T2DM place a considerable financial burden on individual patients and on society (Mukhopadyhyay *et al.*, 2010). Diabetes self-management education is the cornerstone of care for all patients with diabetes and is necessary for the improvement of patient outcomes; it is defined as the ongoing process of facilitating the knowledge, skill and ability necessary for diabetes self-care (Mukhopadyhyay *et al.*, 2010).

2.4 Diabetes Knowledge, Attitude and Practice in other parts of the world

Knowledge is the greatest weapon in the fight against diabetes mellitus. Information can help people assess their risk of diabetes, motivate them to seek proper treatment and care, and inspire them to take charge of their disease (Maina *et al.*, 2011).

This is further supported in another study by Kulkarni and Udgir, that knowledge and awareness about diabetes, its risk factors, complications and management are important aspects for better control and better quality of life. As prevention is better than cure, awareness is always helpful to reduce the incidence of earlier onset of disease and its associated complications (Kulkarni *et al.*, 2012).

In a national population based survey done in Mongolia in 2010, where by half of the participants were from the urban areas and the other half from the rural areas, the study findings demonstrated low knowledge of diabetes, with one in five Mongolians reported to have never heard the word diabetes prior to the interview. This knowledge gap was particularly pronounced in the rural participants and small regional towns (Demaio *et al.*, 2013).

The same study also established that rural, unemployed, less-educated and male populations are found to hold lower levels of knowledge on diabetes and are the same groups found to experience higher burdens of the disease (Demaio *et al.*, 2013).

In Oman, there is lack of general awareness of diabetes including the major risk factors for T2DM with 46% of the study participants able to define the disease despite having a prevalence of 11% for diabetes (Al Shafae *et al.*, 2008).

In another similar study done amongst a general population in India, about 25% of the participants had poor knowledge of diabetes (Kulkarni *et al.*, 2012). However, amongst diabetes patients, knowledge levels were significantly better with about 46% and 83% knew how the disease was detected (Shah *et al.*, 2000).

This is however, does not cut across all diabetic patients as poor knowledge of the disease have also been established amongst them. In a study done in Nigeria, 48% of the diabetic patients did not good knowledge of the disease and the overall mean knowledge mean score of 6.2+/-2.2 (Jasper *et al.*, 2013).

In another study carried out in rural Bangladesh, the knowledge of diabetes and its risk factors was very limited even among persons with T2DM, with only 50% of the participants having reported that they knew physical inactivity was a risk factor and 4% knew what glucose tolerance test was (Islam *et al.*, 2014).

On the other hand, in countries that have policies in tackling diabetes such as Singapore, the knowledge levels was found to be at 99% in both diabetic and non-diabetic populations (Tham *et al.*, 2004).

2.4.1 Diabetes Knowledge, Attitude and Practice in Kenya

Most studies on the knowledge, attitude and practices of diabetes done in Africa and elsewhere target patients with diabetes (Maina et al., 2011). In a descriptive cross-sectional study involving 2000 participants drawn from 8 districts in 4 provinces, targeting both urban and rural districts; found that about 71% of Kenyans have poor knowledge on diabetes, 74% did not know the cause of diabetes and a similar number (74%) did not know that the disease has complications.

2.5 Diabetes Management

The overall aim of diabetes management is to improve quality of life and prevent premature death: the short term goal is relief of symptoms and acute complications while the long term goals include achievement of appropriate glycaemia, reduction of concurrent risk factors, identification and treatment of chronic complications and maintenance of other preventive activities (e.g. immunisation) (MOPH, 2010). Management of the person with diabetes requires the skills of several professionals (general practitioner, specialist physician, diabetes educator, podiatrist, dietitian, ophthalmologist or optometrist, exercise professional and dentist) and the active participation of the patient.

In Kenya the National Clinical Guidelines for the Management of Diabetes Mellitus 2010 offers a step by step help to health workers to provide this optimal care (MOPH, 2010). The Guidelines were based on the Clinical guidelines for Management of Diabetes in Sub Sahara developed by the International Diabetes Federation (IDF) Africa. The purpose of these Guidelines is to provide simple and practical ways to assess persons with diabetes and make the right diagnosis and provide the best treatment and care. Secondly to assist health care providers to identify locally appropriate and sustainable ways of improving diabetes management and lastly to mainstream diabetes management into the health care system.

Poor awareness and practices among diabetic patients regardless of gender are some of the important variables influencing the progression of diabetes and its complications, which are largely preventable. It is important that all patients know the range the ideal range to avoid short term symptoms and long term complications. Frequent blood sugar testing is a critical component of good diabetes management. According the American Diabetes Association (ADA), the range of fasting blood sugar that patients should aim for is between 4 and 7 mmol/L (ADA, 2006). Ideally, patients using insulin should check their blood sugar at least before each meal if not more frequently. Frequent testing can help patients avoid symptoms of both high and low blood sugar.

Patients need to be encouraged to reduce their portion sizes and use techniques to minimize the number of carbohydrates they are consuming. In addition to this a habit of physical activity needs to be promoted on the population level. People will spend more time and effort trying to maintain a constant and healthy blood sugar level if they knew of the terrible long term complications of diabetes: vision loss, kidney failure, heart problems, numbness of the hands and feet and delayed wound healing (Dropkin 2010).

The Institute of Medicine defines self-management as the task that individuals must undertake to live with one or more chronic conditions. These tasks include having the confidence to deal with medical, behavioral, and emotional management of their conditions. Diabetes mellitus is primarily a self-managed condition. Self-management is the foundation for achieving optimum glucose control necessary to avoid the complications of diabetes through increasing knowledge and awareness and learning effective behavioral techniques to manage diabetes (MCDCP, 2006).

People with diabetes have the responsibility to maintain their condition on a day to day basis, communicate with their healthcare provider periodically throughout the year and seek advice when necessary. To effectively self manage diabetes; those with the disease must identify symptoms of emerging health crisis, adhere to complex medication schedules and modify longstanding lifestyle behaviours such as their diet and physical activity levels (Nwankwo *et al.*, 2010).

Diabetes self-management education has become an important part of the clinical management of diabetes however the process is often complex, demanding and not given much emphasis at professional level because of the time constraint of clinicians.

Socio-economic status is a complex characteristic, generally understood to encompass not only income and education level, the measures most commonly used, but also a wide range of associated factors that may affect the quality of health care patients receive, including insurance status, access to care, patients' health beliefs, and many facets of the doctor-patient relationship, such as trust and communication (Zgibor & Songer, 2001). Socio-economic status and its constituent elements are accepted as being determinants of health. For primary prevention of diabetes complications to be effective, patients must have access to quality medical care, the means to pay for services (either through insurance or self-pay), and the knowledge and skills to manage their diabetes on a day-to-day basis. Because access and self-care are critical contributors

to outcomes in patients with diabetes, socioeconomic mediators (education and/or income) may play a significant role in these processes.

This chapter on literature review looked in depth the description of diabetes disease, including the complications and economic impact of the disease as well as its impact on humanity. From the studies reviewed, there was little evidence that work has been done to examine diabetes knowledge in a rural community.

CHAPTER THREE RESEARCH PROBLEM

3.0 Introduction

This chapter presents the statement of the research problem, the conceptual framework that was used, the significance of the study and the study objectives.

3.1 Statement of the Problem

As diabetes prevalence and incidence continue to grow at unprecedented rates, addressing diabetes as a public health problem is more important than ever before. Treating diabetes as a public problem means understanding and appreciating that it affects not only individuals but also families, communities, and society. This is all happening in an environment that is affected by a new phenomenon referred to as double burden (both communicable and non-communicable diseases) by the health professionals (MoH, 2010)

The complications of undetected and untreated diabetes are serious and cause huge human suffering and disability, and have huge socio – economic costs resulting from premature morbidity and mortality. Diabetes is one of the leading causes of blindness, renal failure and lower limb amputation. It also triggers cardiovascular disease which is the leading cause of deaths in diabetes patients (MOH, 2010).

Diabetes is a chronic disease that requires patients to continue their treatment for the rest of their lives. The emphasis is usually therefore, on the control of the condition through a tight schedule of blood glucose and urine sugar monitoring, medication and adjustment to dietary routine. Such a chronic condition requires competent self-care, which can be developed from a thorough understanding of the disease process by the patient and pre-supposes a need for some form of diabetes education and counseling for the patient. For people with diabetes, medical issues are not the only area that requires management; lifestyle, family, psychosocial, cultural, and economic issues also need attention.

To confound all these, there is very low public awareness of most chronic diseases particularly diabetes. This is basically due to lack of Primary Health Care (PHC) systems that are geared towards tackling chronic diseases. There is lack of population based data on the burden and trends of diabetes and no comprehensive research exists that can inform policy on the best practices for the control of diabetes (MOH, 2010).

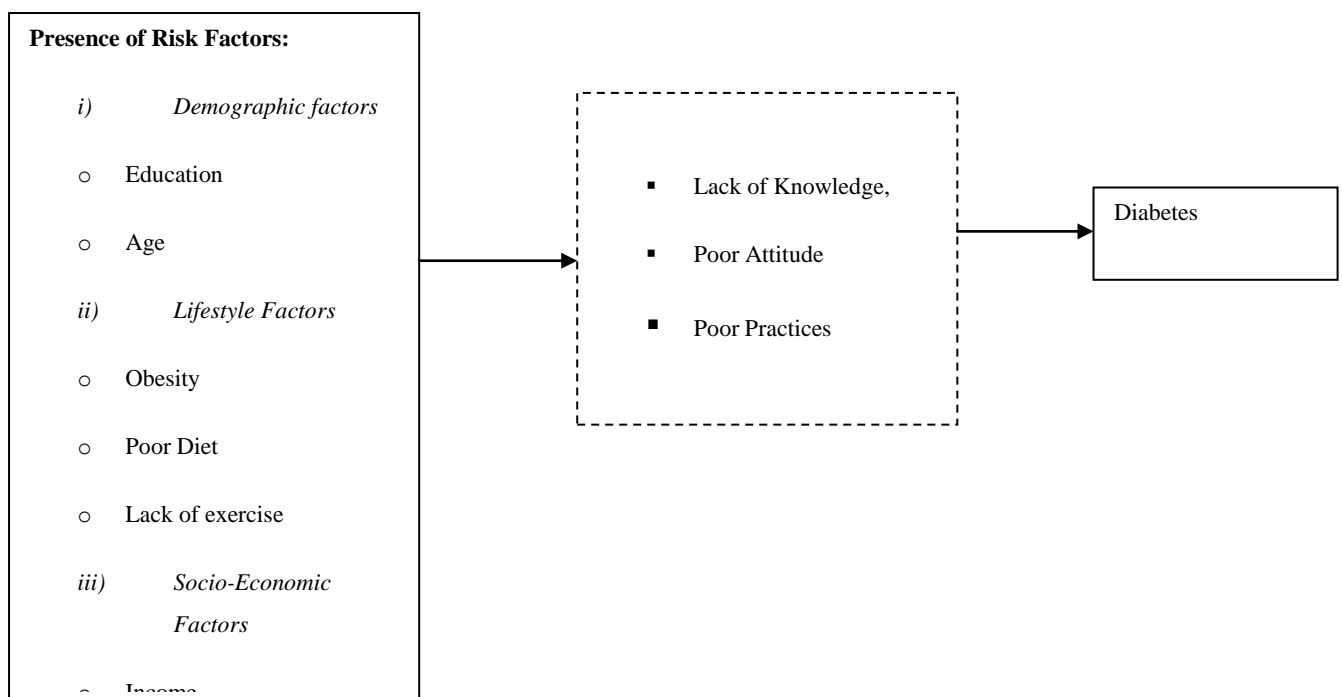
In addition, the government, media, and the general public have more readily accepted other diseases as public health issues; for example HIV/AIDS, some forms of cancer, and communicable diseases such as malaria. In contrast, diabetes and other chronic illnesses continue to be viewed as clinical diseases (Glasgow *et al.*, 1999).

Poverty generally in the world has a rural face, with challenges in health coverage a common phenomenon in developing countries (World Bank, 1993). Health systems are said to be consistently inequitable, providing more and higher quality services to the well-off rather than to the poor, who need them more. (Davidson R. 2004). Thus, with increasing number of diabetic cases attention is therefore needed on prevention and control of non-communicable diseases especially in rural areas.

3.2 Conceptual Framework

A conceptual framework seeks to construct a theory in order to explain or predict a phenomenon as viewed in the study. Figure 1 shows the conceptual framework that was used in the study.

Figure 1: Conceptual Framework



The conceptual framework draws upon the observation of existence of certain risk factors that result into developing diabetes. A health risk factor is defined as anything that increases one's chances of getting a disease (Baptiste-Roberts, 2007).

3.2.1 Narration of the conceptual framework

Demographic Factors:

- **Education**

Education in this study refers to educational attainment or the number of years or level of overall formal schooling a person has received rather than teaching on specific health topics like hygiene, diet, education or diabetes.

Studies have shown, that people with more education are likely to live longer, to experience better health outcomes and to practice health-promoting behaviors such as exercising regularly, refraining from smoking, and obtaining timely health care checkups and screenings. This is because education can increase people's knowledge, problem-solving, and coping skills, enabling them to make better-informed choices among the health related options available for themselves and their families, including those related to obtaining and managing medical care (Cutler and Lleras-Muney,2006; Low *et al.*,2005; Ross and Mirowsky, 2003).

Education also influences their attitudes (how an individual perceives the susceptibility and severity) and practices in so doing, improving their quality of life by preventing the disease in this case diabetes from occurring (Cutler and Lleras-Muney,2006).

- **Age**

Studies have shown that as people get older, the risk for developing cardiovascular disease and diabetes increases (Choi and Shi, 2001). This may be attributed to the progressive physiological changes that occur while aging that result to decrease in the function of various organ systems such as the cardiovascular system and renal system (Butler R *et al.*, 2002).

Lifestyle factors:

- **Obesity**

Obesity is defined as abnormal or excessive fat accumulation that may impair health (WHO, 2015). The fundamental cause of obesity and overweight is an energy imbalance between calories consumed and calories expended and this has been credited to an increased intake of energy-dense foods that are high in fat and an increase in physical inactivity due to the

increasingly sedentary nature of many forms of work, changing modes of transportation, and increasing urbanization (WHO, 2015).

Literature has shown that obesity increase the chances of developing diabetes, this is because it increases insulin resistance and deficiency in insulin secretion by the pancreas (AIHW, 2008).

- **Diet**

Diet in this study refers the kinds of food that a person or community habitually eats. Poor diets have been shown to increase the chances of developing diabetes due to increase blood sugars and weight (Frank B *et al.*, 2001).

- **Exercise**

Exercise in this study refers to any activity requiring physical effort and carried out to sustain health and fitness. According to literature, regular exercises are beneficial to one's overall state of health as it lowers blood sugar, burns extra calories and fat and improves blood flow and blood pressure (Frank B *et al.*, 2001). Thus, the more exercise an individual does, the lesser the chances of developing diabetes.

Social- Economic Factors:

- **Income**

According to a study done by doctors Rabi and Ghali, they demonstrated that neighborhoods with low income have a higher prevalence of diabetes than do wealthy neighborhoods. The study holds the view that the increased diabetes risk seen in low income groups is related to the increased prevalence of obesity within this group (Rabi *et al.*, 2006).

Increase in obesity is attributed to poor nutrition a common phenomeon amongst rural and remote populations (AIHW, 2008).

3.3 Significance of the Study

Information is a vital tool enabling the pursuit of equity in health. The limited availability of good quality data on health disaggregated by household characteristics such as sex and age has been a major obstacle to responsive planning and policy-making.

Without knowing whether and in what dimensions of health, and in which population subgroups disadvantages exist, there is no way to begin redressing inequities in health. The urgency of collection, analysis and publication of data disaggregated by sex and age cannot be overemphasized (WHO, 2010).

Assessment of the community awareness and health practices especially in a rural community that has low opportunities to good health facilities as well as low literacy levels about chronic diseases such as diabetes is important in developing educational material relevant to them, taking into consideration factors such as age, education level, gender and income. Assessing the socioeconomic and cultural factors that affect their management is also important as strategies can be localized for particular groups.

The study aims at providing findings that will assist in informing community based/ household based diabetes education and management by the various key stakeholders such as the Ministry of Health, health insurers and relevant Non Governmental Organizations. Programs can formulated specifically for the rural community thereby reducing morbidity associated with diabetes and therefore improve their quality of life.

3.4 Study Objectives

3.4.1 General Objective

The main objective of this study was to assess the level of a rural community awareness of diabetes and how this knowledge influenced their attitude and practices in prevention and control of the disease.

3.4.2 Specific Objective

- To determine the socio-demographic characteristics of the study population. These included gender, age, educational level and income.
- To determine the participants level of knowledge of diabetes disease
- To determine participants attitudes and practices towards diabetes disease.
- To determine factors that influence diabetes knowledge, attitudes and practices of the community members in a rural setting.

3.5 Hypothesis

A hypothesis is a tentative statement about the relationship between two or more variables in a study. For statistical testing, the null hypothesis is used and this is the proposition which implies that there is no effect or relationship between variables being studied.

The null hypothesis is popular because it can be tested if found to be false, there is a relationship between the observed data.

The following are the null hypotheses that were tested for this study:

- Socio-demographic characteristics have no effect on diabetes knowledge
- Socio-demographic characteristics have no effect on attitude towards diabetes
- Socio-demographic characteristics have no effect on healthy practices

CHAPTER FOUR METHODOLOGY

4.0 Introduction

This chapter describes the study design, population, sampling and data collection for the study. Also included in this section are inclusion and exclusion criteria, study variables and their measurements, measures taken to minimize errors and biases and ethical considerations.

4.1 Study Design

This study adopted a descriptive cross sectional study design as it aimed at determining knowledge, attitudes and practices towards diabetes prevention and control at a specific point in time. The study employed both qualitative and quantitative approaches in data collection.

4.2 Study Site

The study was conducted in Jambo Village, Iria-ini location, Mathira Division in Karatina, Nyeri County. Nyeri county is 150Km north of Nairobi, Kenya's capital city and has a population of 693,558 people according to KNBS statistics results of 2009. The main economic activity include dairy farming, coffee, tea, pyrethrum and commercial businesses and its main agricultural products include maize, beans, yams, cassava, millet, sorghum, bananas and livestock products.

Selection of a rural population in Nyeri County was because, the region is said to have the highest prevalence of this disease compared to other regions in the country (Standard Newspaper, 14th November 2013).

Jambo village has a population of about 3,000 people (informal discussions with the local chief on the 28th November, 2013). It is a rural site within Karatina, the headquarters of Mathira Constituency, with an estimated population of 6,852 people, whose main occupation is farming. On health service delivery, Karatina has two main facilities, Karatina General Hospital and Jamii Hospital.

4.3 Study Instruments and techniques

Study instruments refer to the data collection tools used; for this study the following instruments were used:

- i) Questionnaire: This is a guide that was developed for the study with closed ended questions and a list of possible options or answers from which the respondents chose.

The structured questionnaire was designed to assess awareness of diabetes, its management, self management practices, socioeconomic and cultural factors amongst household participants.

- ii) Focus Group Discussion (FGD) – this refers to a group discussion of approximately 6 - 12 persons guided by a facilitator, during which group participants talk freely and spontaneously about a certain topic or issue.
- iii) Key Informant Interviews – This refers to a tool that uses open ended questions to obtain attitudes, opinions and suggestions of respondents on various topics.

4.4 Study Population

Study population refers to a group of people researchers are interested in and from which we can draw a sample. Apart from people, study population may consist of villages, institutions and records. The sources of data for this study were the members of households within study location.

Focus group discussion participants were randomly selected from the following groups- men only, women only and diabetic patients group made of men and women alone. Some of the participants included social support group leaders and farmers.

Key informant respondents were recruited from the wider community and included the district medical officer of health, the nurse in charge of the diabetic clinic at the Karatina sub-county hospital and local administrative heads – the chief of Jambo village and the village elder and diabetic support group leader.

4.5 Sampling Technique and Sample Size

According to Varkeisser *et al.*, 2003 in designing and conducting health system research projects manual, sampling refers to the process of selecting a number of study objects or units from a defined study population.

4.5.1 Sample Size Determination

Using Raosoft Sample Size Calculation Software, the researcher determined the sample size as 341 from the study population. Whereby the margin of error (this is the amount of error that the researcher can tolerate) was set at 5%, 95 % confidence interval (the amount of uncertainty, the

researcher can tolerate), with a population size of 3,000 residents in Jambo Village and a response distribution of 50%. Table 1 below shows the sample size:

Table 1: Sample Size

| Margin of Error | Confidence Interval | Population Size | Response Distribution | Sample Size |
|-----------------|---------------------|-----------------|-----------------------|-------------|
| 5 % | 95% | 3,000 | 50% | 341 |

Raosoftware was developed in 1991, by Dr. Rao an academician based at the University of Washington (Raosoftware, www.raosoftware.com assessed on 29th Oct 2013).

The formula applied was:

$$n = \frac{Z^2 (c/100)^2 r(100-r)}{N} \times \frac{N}{(N-1)E^2 + x} \quad E = \text{Sqrt} \left[\frac{(N-n)x}{n(N-1)} \right]$$

Where N is the population size, r is the fraction of the responses that the researcher was interested in, and Z (c/100) is the critical value of the confidence level c. An allowance of 3% was set for non-response insurance at (11) and the total sample size was thus 352.

4.5.2 Sampling Method

In order to decide on how to select the sample required for this study, I employed the following sampling methods:

- Purposeful sampling method for qualitative data:

This is a research method that is used typically when focusing on a limited number of informants, who are selected strategically so that their in-depth information will give optimal insight into the issue being studied.

In view of this study, this method was used to identify study participants for the key informant interviews by examining which person or function can shed more light on the major health issues in the study population, community response to tackling diabetes disease and barriers to managing diabetes. With this background the researchers purposively sought and selected the following participants; the district medical officer of health in Mathira, the nurse in charge of the diabetic clinic at the Karatina sub-county hospital and local administrative heads – the chief of Jambo village and the village elder and diabetic support group leader.

- Simple Random Sampling for quantitative data

Identification of households that participated in this study was randomly selected from a list of households with the village elder, which was developed during the census of elderly persons in 2013. The households were given numbers to identify them; which were then placed in a box after which the researcher shook the box and picked a number from the box, thereafter every fourth house was picked until the sample size was reached.

4.6 Inclusion and Exclusion Criteria

4.6.1 Inclusion criteria

In order to participate in the study, the following criterion was used:

- Participants had to be over 18 years of age, the legal age of consent.
- Every suitable respondent qualified for only one interview.
- Voluntary informed consent to participation was a requirement and only after consenting was a community member allowed to participate in the study.

4.6.2 Exclusion criteria

The following criterion was used to exclude community members from the study:

- Anyone who did not agree to participate in the study
- Anyone who was unable to speak due to illness or frailty.
- Anyone who was below the age of 18 years.

4.7 Variables and their measurements

The dependent variables in the study were diabetes knowledge, attitudes and practices while the independent variables were demographic factors, socio-economic factors and life style factors as shown in table 2.

Table 2: Dependent and independent variables

| Dependent Variable | Independent Variable |
|---|--|
| Diabetes knowledge, Attitudes and Practices | <i>Demographic factors:</i> Age Educational Level Marital Status Parenthood status <i>Lifestyle Factors:</i> Obesity |

| | |
|--|---|
| | Poor Diet Lack of exercise <i>Socio-Economic Factors:</i> Occupation Income |
|--|---|

The above study variables were defined as follows:

- Age, measured by age at last birthday.
- Marital status was defined by respondents' marriage status, clustered into married, single or widowed.
- Parenthood status as determined by the number of children born to the respondent.
- Occupation, categorized as either by self employed or employed.
- Level of education as measured by the highest level of education attained by the respondent. The following are the levels of education that exist- primary, secondary and post secondary.
- Distance to the nearest health facility measured in kilometers.
- Income level measured as daily earnings of the household of a respondent.

4.8 Data Collection Methods

Data for this study was collected in the month of May and June 2014 through structured questionnaire (Appendix V: Survey Form) during face-to-face interviews by the researcher assisted by research assistants and consent was sought prior to being interviewed. The research assistants visited the selected participants' homes to collect data by administering the questionnaire.

Each questionnaire had an informed consent form which the participants were required to sign (or thumb print) after understanding the purpose of the study. The informed consent form is provided in Appendix II. Interviews were conducted in either Kiswahili, English or Kikuyu depending on the subject's preference. Data collection was carried out on weekdays in the months of May to June 2014 and at convenient times to avoid interfering with farming activities. Special arrangements were made to interview those participants who were not available on weekdays.

The content of the questionnaire was borrowed from sample diabetic patient questionnaires from Stanford University School of Medicine, ICICE Baseline Interview for Diabetes patients,

Australian Diabetes Organization and the International Diabetes Federation. This is because much of the tools on knowledge, attitude and practice have already been done and tested in other studies (Kulkarni G *et al*, 2012; Tham *et al.*, 2004).

Part 1 of the questionnaire covered the respondent's background information, part 2 covered awareness of diabetes management, part 3 covered self management practices, and part 4 covered socioeconomic and cultural factors.

All filled questionnaires were then submitted to researcher who checked their completeness before the research assistants leave the area. Where information was missing the interviewer revisited the respondent for further information unless they had initially declined to disclose.

Focus group discussion comprised of ten members each. A guide was used to lead these discussions (Appendix IX: Focus group discussion guide). A total of three (3) focus group discussions were held.

Key informant discussions were conducted with the area chief, the village elder, in-charge of the diabetics' clinic and the district medical officer of health for Mathira area. A guide was used to lead these discussions (Appendix VIII: Key informant guide). Four (4) key informant discussions were conducted.

4.9 Pre-Test

A pre test was conducted in order to assess the validity and reliability of the questionnaire. A total of 22 questionnaires were administered at the pilot stage. The exercise was done by administering the questionnaires to the respondents after first explaining and asking for informed consent.

The respondents were optimistic and ready to give feedback, during this exercise the researcher took advantage to train the research assistants who later participated in data collection exercise. The research assistants were drawn from the same community in Karatina and were mainly community health workers attached to the Karatina sub county hospital.

The pre test revealed the need to revise questions relating to practice as the Cronbach alpha was way below the recommended threshold of 0.7. The negative value was due to a negative average

covariance among items. This was since addressed by the researcher by deleting the questions that were open ended and coding all the responses.

4.10 Reliability and Validity

4.10.1 Reliability

Reliability refers to the extent to which the questions are able to elicit comparable responses. The questionnaire was tested for reliability during the pre test to ensure that respondents understood the questions. Cross checking, inspection and scrutinization of the pre tested data was carried out to determine the accuracy, relevance, completeness, consistency and uniformity of the questions. The feedbacks from the pre test were incorporated in the questionnaire before the start of field work. The research assistants were well trained before participating in the study.

The researcher also disclosed biases and values through reflexive approaches (which were captured in the field journal). Reproducible semi-structured interview protocols were used and the interviews were recorded and transcribed verbatim according to standard procedures. Each of these measures increased reliability and create the audit trail to demonstrate the dependability of this work.

4.10.2. Validity

Validity refers to the extent to which the questions are able to address all the research objectives. The study addressed internal validity by ensuring that the acceptable sampling method and procedure has been followed, triangulating data from multiple and different sources of information and methods of data collection in order to understand and gain insight into what factors influence knowledge, attitude and practices on diabetes prevention and control.

Each of the face-to-face semi-structured interviews was audio taped and transcribed for coding, analysis by the researcher and feedback from participants in the form of member checking helped determine if the written information was presented with accuracy throughout the stages of the study. The aim of the researcher's work was to provide internal validity and credibility through presentation of a true picture of what is studied. A field journal was kept throughout the study to provide a record of events and activities as well as decisions about the course of the study.

4.11 Minimization of Errors and Biases

Bias is defined as any tendency which prevents unprejudiced consideration of a question. In research, bias occurs when “systematic error is introduced into sampling or testing by selecting or encouraging one outcome or answer over others”. Bias can occur at any phase of research, including study design or data collection, as well as in the process of data analysis and publication (Pannucci *et al.*, 2010).

Errors are defined as any difference between the average values that were obtained through a study and the true average values of the population being targeted (Cheung *et al.*, 2009). In this study the type of errors was most likely non sampling errors, which are defined as errors that are as a results of mistakes made during the implementation of data collection protocol and data processing, such as data entry errors, a refused interview, misunderstanding of the questionnaire by the interviewer or the interviewee or even failure to interview the correct respondent.

Absolute care was taken to ensure that these errors and biases are minimized through the following ways:

- Study design and data collection method was informed by a number of literature reviews.
- Recruited research assistants were required to have attained post secondary training. Preference was given to candidates who had previous field research experience.
- Effective training of research assistants was done prior to field data collection to ensure quality output.
- Recruitment of participants was according to the sampling method outlined in the study.
- Filled questionnaires were edited in the field to check for missing information and inconsistencies. Where possible, these were corrected in the field. Field data were also entered as soon as questionnaires were certified complete.
- A verification procedure was introduced in the study whereby data was entered twice by two different people; the two data-sets were then compared and any inconsistencies resolved.
- The researcher took absolute care to avoid data processing errors such as coding, data entry, and programming mistakes and maintained a field journal.

4.12 Ethical considerations

Prior to data collection, this study was presented to the Kenyatta National Hospital/ University of Nairobi Ethical Review Committee (KNH/UON ERC) for scientific and ethical approvals. (Appendix 1: Approval letter by KNH/UON - ERC).

The other ethical considerations that were made by the researcher include:

- Research assistants were trained on research ethics and monitored to ensure that they obtained informed consent from all participants prior to conducting an interview. (Appendix II: Research Participation Consent form).
- Participation in the survey was entirely voluntary and this was emphasized from the onset and consent forms were attached to each questionnaire.
- The researcher assured participants of confidentiality of all the study materials.
- Participants in the focus group discussions were in addition informed that a recorder would be used to capture information. This was discussed elaborately to ensure that the respondents were comfortable with the use of the device. In all, voluntary informed consent was sought from all the participants. (Appendix VIII: Informed consent form for both FGD and In-Depth Interview)

4.13 Study Limitations

Information bias

The participants in some instances may have given only information that they were comfortable in disclosing especially on matters considered very personal like income.

Responder bias

The study did not conduct testing of the respondents to establish if they were diabetic or not, thus relied heavily on the feedback of the participants.

CHAPTER FIVE RESULTS

5.0 Introduction

This chapter presents the study results as well as the data analysis. The data analysis is in harmony with the specific objectives where patterns were investigated, interpreted and inferences drawn on them.

The results are presented as follows: section 5.1 presents the socio-demographic characteristics of the respondents, section 5.2 presents the results under knowledge levels on diabetes type 2, section 5.3 presents attitude of the community, section 5.4 presents the health practices of the community and lastly section 5.5 presents the cross tabulation results of knowledge, attitude and practices in relation to socio-demographic characteristics as well as the results of the logistic regression analysis.

5.1 Demographic Characteristics

This section presents the respondents socio-demographic characteristics.

5.1.1 Response Rate

A total of 352 respondents participated in the quantitative arm of the study, 3 focus group discussions each composed of ten members and 4 key informant interviews were held. An overall response rate of 100 % (352/352) was achieved in the study. This means that the results are adequately representative of the target population from which it was drawn as it was above the required 70% response rate (Patel *et al.*, 2003).

5.1.2 Gender

Table 3: Gender distribution of the respondents

| Gender | Frequency | Percent |
|---------------|------------------|----------------|
| Male | 122 | 34.7 |
| Female | 230 | 65.3 |
| Total | 352 | 100.0 |

Of the targeted respondents, there were more females 230 (65.3%) than males 122 (34.7%) interviewed for this study.

5.1.3 Education level

Table 4: Education level of the respondents.

| Socio-demographic characteristic | Indicator | Frequency | Percentage |
|---|----------------------|------------------|-------------------|
| Education Level | No formal education | 10 | 2.8 |
| | Primary incomplete | 35 | 9.9 |
| | Primary complete | 103 | 29.3 |
| | Secondary incomplete | 62 | 17.6 |
| | Secondary complete | 108 | 30.7 |
| | Post Secondary | 34 | 9.7 |
| | Total | | 352 |

The study sought to assess the knowledge, attitude and practices of diabetes. Of the 352 respondents who participated in the study (2.8%) had no formal education, (9.9%) had incomplete primary school education, (29.3%) had complete primary school education, (17.6%) had incomplete secondary school education, (30.7%) had complete secondary school education and (9.7%) had post secondary school education. The study findings imply that majority of the respondents can be considered to be literate, whereby a literate person is one who has the ability to read and write (UNESCO, 2006). These findings are consistent with the results of the 2006 Kenya Adult Literacy Survey Report, which indicate that the national literate rate stands at 61.5% while that of Nyeri District is at 76%.

This may be attributed to the commitment that education is a human right as enshrined in the Constitution (Government of Kenya, 2010), the Basic Education Act of 2013, and Sessional Paper No. 14 of 2012 on Reforming Education and Training Sectors in Kenya, provide for free and compulsory basic education in pre-primary, primary and secondary levels (GoK, 2013).

Education is very critical as studies have shown that lower health literacy has been associated with poor self-management, limited involvement in health care consultations and decision making processes, more emergency department use and more hospital admissions due to limited knowledge and understanding of health (Edwards *et al.*, 2012).

- **Education level of spouse**

Twenty three point six percent of the respondents indicated that their spouses had completed secondary education, followed by (21%) whose spouses had completed secondary education, (12.8 %) of who indicated that their spouses had not completed secondary education, followed 6.3% who had not completed primary education and (1.7%) of the respondents had no formal education.

5.1.4 Occupation and Income

Table 5: Occupation and income of the respondents

| Socio-demographic characteristics | Indicator | Frequency | Percentage |
|--|---------------------------|------------------|-------------------|
| Occupation | Not employed | 42 | 11.9 |
| | Self-employed | 162 | 46 |
| | Employed part time | 25 | 7.1 |
| | Employed full time | 29 | 8.2 |
| | Small scale farming | 50 | 14.2 |
| | Work around the homestead | 41 | 11.6 |
| | Retired/ Pensioner | 2 | 0.6 |
| | Refused | 1 | 0.3 |
| Income per day | Kshs 0- 199 | 61 | 17.3 |
| | Kshs 200-499 | 201 | 57.1 |
| | Kshs 500-799 | 39 | 11.1 |
| | Kshs > 800 | 12 | 3.4 |
| | Refused | 4 | 1.1 |
| | Not Applicable | 35 | 9.9 |

From the above table, the definition used for self-employment refers to persons who run their own enterprises or businesses; employed part time refers to those people who work for institutions or people on a need to need basis or less than 4 four hours a day while employed full time refers to those who work for their employer atleast eight hours a day.

The study findings indicated that majority (46%) of the respondents were self employed, followed by (14.2%) small scale farmers, (11.9%) not employed, (11.6%) work around the

homestead, and (8.2%) were in full time employment. The findings imply that majority of the respondents about (91.8%) are not in any formal employment.

Similar findings were seen in 2 FGD interviews with a group of women, whereby most of them said they were small scale farmers and their spouses were business men.

'We do farming in our shambas at home for our consumption, while our husbands do small businesses as well as selling the farm produce such as eggs from the chicken' FGD 1 (participant 2 and 3).

'Farming is all we know and do' FGD 2 (participant 5).

Nonetheless, due to changes in the weather conditions, little income has been derived from farming as the crops get spoilt as well as poor coffee prices.

This is not very far off from the national statistics that has shown 19% of Kenyans are in formal employment while the informal sector caters for 83.2%, giving an average of 86.9% of the rural population are within the group considered to have descent work (KIPRA, 2013). Also, employment in the informal economy is more pronounced in rural areas where about 87 per cent of the working-age population is engaged in informal activities (GoK, 2010).

The respondents were asked to state their daily income accruing from their various occupations. A majority (57%) of the respondents indicated that they earned 200-499 Kenya shillings per day, while (17%) indicated 0-199 Kenya shillings and (11%) indicated 500-799 Kenya shillings. The study findings imply that most of the respondents were casual labourers with low income. This is consistent with the analysis of respondent's occupations whereby slightly less than half the respondents were in formal employment and in the focus group discussions where most respondents reported that they make about 100- 200 Kenya shillings daily. Studies have also shown that incomes in the rural areas are generally lower contributing to the overall rural poverty which is higher than urban poverty (KIPRA, 2013).

5.1.5 Age, Marital Status and Parenthood Status

Table 6: Age, marital status and parenthood status

| Socio-demographic characteristics | Indicator | Frequency | Percentage |
|-----------------------------------|-----------------------------|-----------|------------|
| Marital Status | Single (not married) | 97 | 27.6 |
| | Married | 228 | 64.8 |
| | Separated | 6 | 1.7 |
| | Widow/ widower | 21 | 6 |
| Religion | Christian | 350 | 99.4 |
| | Muslim | 1 | 0.3 |
| | Traditional | 1 | 0.3 |
| Parenthood Status | No Children | 80 | 22.7 |
| | Children (State the number) | 272 | 77.3 |

From the above table, majority (64.8%) of the respondents were married, followed by (27.6%) who were single, followed by (6%) who were either widows or widowers and (1.7%) had separated. The study findings imply that majority of the respondents were married and this could have led to better living and healthy standards thus able to understand about diabetes.

On children, seventy seven point three percent of the respondents indicated that they had children and (22.7%) of the respondents indicated that they had no children. The average number of children that the participating respondents had was 2 children. Statistics have shown Kenya is experiencing a decline in the number of children per family from 8.1 in 1978 to 4.6 in 2008, and are projected to decline to 2.4 by 2050 (Fengler, 2010). While on religion, a majority (99.4%) of the respondents was Christians while the rest were either Muslims (0.3%) or traditionalists (0.3%).

On age, the ages of study participants ranged from 18 to 102 years with an average age of 38 years. Nineteen percent of the study respondents were aged above 50 years with (20%) aged between 18-25 years and (61%) of the respondents were aged 26-50 years. The findings imply majority of the respondents were over 26 years which implies that the respondents were mature enough hence in better position to understand the health challenges in the community.

5.1.6 Diabetes Status

Table 7: Diabetes status

| Respondent characteristics | Indicator | Frequency | Percentage |
|-----------------------------------|------------------|------------------|-------------------|
| Diabetes Status | Yes | 15 | 4.3 |
| | No | 311 | 88.4 |
| | I don't know | 26 | 7.4 |
| Household Member with Diabetes | Yes | 69 | 19.6 |
| | No | 274 | 77.8 |
| | I don't know | 8 | 2.3 |
| | Not Applicable | 1 | 0.3 |

From the table above, majority of the respondents said they were not diabetic 311 (88.4%) as compared to 15 (4.3%) of the respondents who said they were diabetic and (7.4%) who did not know their diabetes status. Amongst the 15 who confirmed they were diabetic, 6 (1.7%) had diabetes for a duration of less than two years, 3 (0.9) had diabetes between 3 to 5 years, 2 (0.6%) had diabetes between 6 to 9 years and 4 (1.1%) of the respondents had suffered from diabetes for more than 12 years. Majority 14 (99%) of the diabetics were given their diagnosis at Karatina sub county hospital and one person in a private facility.

About 254 (77.8%) of the respondents did not have a member of their household with diabetes, and 69 (19.6%) were aware of the members of their household who have diabetes. Of these 69, 20 (5.7%) had diabetes for a duration of two years and below, 24 (6.8%) of the respondents had diabetes between 3 to 5 years, 8 (2.3%) had diabetes between 6 to 9 years and 9 (2.6%) of the respondents had diabetes between 10-12 years and 8 (2.3%) had diabetes for more than 13 years.

5.2 Diabetes Knowledge

The second objective of the study was to determine the participant's level of knowledge of diabetes disease. The respondents were asked a number of questions relating to their awareness; the results of these are summarized in the tables 8 and 9 below.

Table 8: Knowledge of diabetes

| Question | Response | Frequency | Percentage |
|--|----------|-----------|------------|
| Diabetes is a chronic disease in which blood glucose is too high | Yes | 198 | 56.3 |
| | No | 154 | 43.7 |
| Is diabetes hereditary | Yes | 166 | 47.2 |
| | No | 186 | 52.8 |
| Can diabetes be cured | Yes | 220 | 62.5 |
| | No | 108 | 30.7 |

From the above table, majority 198 (56.3%) of the respondents indicated that diabetes is a chronic disease in which blood glucose is too high and 154 (43.7%) did not know what diabetes is. Also the majority of the respondents 220 (62.5%) thought diabetes can be cured while 108 (30.7%) knew that the disease presently has no known cure. These findings are almost similar to a KAP survey done amongst general public in 4 provinces whereby in Central province (30.8%) knew what diabetes is (Maina *et al.*, 2011) and in Mongolia, where by 50% of the population had never had of the term diabetes prior to the survey (Demio *et al.*, 2013).

Respondents in the qualitative arm of the study said they understood diabetes to be a blood sugar disease whose medicines are too expensive and lifestyle modifications such as eating small portions of meals and walking with sweets has to be done, see below excerpts.

‘We do not know what diabetes really is but what we know it is high sugar in blood’ FGD 1 (participant 2 and 5)

‘What I know this disease is that it causes changes in one’s life as you know have to eat little portions of food, you become sickly all the time and for men out there carry sweets in their coats’ FGD 2 (participant 1)

‘My understanding of this diabetes disease, is when you urinate somewhere where there were no ants and after a few minutes you see ants around the area you urinated, then you have this disease’ FGD 3 (participant 5)

Table 9: Causes, symptoms and complications of T2DM

| Question | Choices | Frequency | Percentage |
|---------------------------------------|---|-----------|------------|
| What are the major causes of diabetes | Lifestyle changes such as reduced physical activity and changes in dietary habits | 143 | 40.6 |
| | Eating Potatoes | 5 | 1.4 |
| | Sin against God | 1 | 0.3 |
| | Vectors such as mosquitoes and jiggers | 1 | 0.3 |
| | I don't know | 202 | 57.4 |
| What are the symptoms of diabetes | Tiredness, weight loss, increased thirst, frequent urination, blurred vision. | 154 | 43.8 |
| | Loss of hair, change in nail colour | 2 | 0.6 |
| | Frequent coughing and sneezing | 3 | 0.9 |
| | I don't know | 189 | 53.7 |
| | Refused | 1 | 0.3 |
| | Not Applicable | 3 | 0.9 |
| Diabetes if not treated, it may cause | Tiredness, weight loss, increased thirst, frequent urination and blurred vision | 40 | 11.4 |
| | Loss of hair, change in nail colour | 1 | 0.3 |
| | Serious complications such as amputations, stroke, kidney disease | 28 | 8 |
| | Frequent coughing and sneezing | 1 | 0.3 |
| | I don't know | 201 | 57.1 |
| | Refused | 81 | 23 |

From the table 8 above, majority of the respondents 209 (59.4%) did not know what causes diabetes, 195 (55.5%) of the respondents did not know symptoms of diabetes and 324 (92.1%) did not know that if diabetes is not well managed it causes serious complications, only 28 (8%) of the respondents in the study were aware of the complications. These findings are comparable to a local study, whereby (29%) of respondents had good knowledge of signs and symptoms of diabetes, (26.1%) could correctly identify the probable causes of diabetes mellitus while (73.9%) could not. About twenty six percent (26.4%) of the respondents could identify complications of diabetes they knew while (73.4%) had very little or no knowledge of complications of diabetes (Maina *et al.*, 2011).

Both FGD and KII revealed that there is a general low awareness of causes of diabetes and its complications due to ignorance which the participants felt was related to education level of the community and also that the disease by nature is not contagious like HIV.

‘You know this disease is not like HIV, where it is transmitted through intercourse that is why our people and also the society have not made a lot of noise’ FGD 2 (participant 7).

‘When you get this disease, your pancreas is finished’ FGD 3 (participant 9).

‘Generally, awareness of diabetes and its complications is very low in Mathira, this is due to low levels of education that has been brought about by poverty and high alcohol consumption. Also there is low awareness amongst lower cadres of health professionals’ Key informant interview with the district medical officer of health.

5.3 Attitude

The third objective of the study was to determine participant’s attitudes and practices towards diabetes disease. The attitudes of the respondents towards the disease were determined using the Likert scale (Likert, 1932). The responses were grouped into four categories: strongly disagree, disagree, agree and strongly agree. Each attitude statement was analyzed individually and rated as positive or negative.

Table 10: Attitudes of the respondents towards diabetes

| Attitude | Attitude Rating | Frequency | Percentage |
|---|-----------------|-----------|------------|
| Is it important that a diabetic patient exercises | Positive | 328 | 93.2 |
| | Negative | 24 | 6.8 |
| Someone with diabetes should follow a controlled diet | Positive | 325 | 92.3 |
| | Negative | 27 | 7.7 |
| Should a diabetic person maintain a healthy weight | Positive | 300 | 85.3 |
| | Negative | 52 | 14.7 |
| Missing medicines for a diabetic person has negative effect on the disease control | Positive | 281 | 79.8 |
| | Negative | 71 | 20.2 |
| Regular visits to the health service providers enables one to control the disease by getting correct advice and clarification | Positive | 330 | 93.8 |
| | Negative | 22 | 6.2 |
| Diabetes is a life sentence and it does not matter | Positive | 175 | 49.8 |

| | | | |
|--|----------|-----|------|
| what lifestyle change one may introduce, the health status diminish overtime | Negative | 177 | 50.2 |
|--|----------|-----|------|

From the above table, 75 (21.3%) 253 (71.9%) of the respondents agreed that it is important for a diabetic patient to exercise: indicating that 328 (93.2%), of the respondents had a positive attitude towards exercises including following a controlled diet whereby an almost similar number 325 (92.3%) of the respondents demonstrated a positive attitude towards it as well as, maintaining a healthy weight 300 (85.3%). In the FDGs, a similar findings was revealed where by the participants were agreeable that exercises, controlled diet and healthy weight were important however on probing further most did not know the importance of the same as they could not give reasons for it.

Table 10 further indicates that 281 (79.8%) of the respondents agreed that missing medicines for a diabetic person has negative effect on the disease control, while 330 (93.8 %) agreed that regular visits to the health service providers enabled one to control the disease by getting correct advice and clarification.

One hundred and seventy seven (50.2) % of the respondents said that diabetes is a life sentence and it does not matter what lifestyle change one may introduce, the health status diminish overtime. This negative attitude can be attributed to the opinion of the respondents which was revealed during the FGD's where by the participants said the disease causes a person to have a radical shift as one has to watch what they eat, eat smaller portions of food and is prone to become sickly at all times.

5.4 Practices

The study also sought to find out the participant's practices towards diabetes disease prevention. The practices assessed included typical food consumed by a family in a day, health seeking behavior and biological monitoring of self. Each respondent's response was analyzed and rated as either poor or good practice.

Table 11: Practices in diabetes prevention.

| Practices | Practice Rating | Frequency | Percentage |
|--|-----------------|-----------|------------|
| Family Meal (Balanced diet) | Good | 7 | 2 |
| | Poor | 345 | 98 |
| Visiting health facility for advice on diet | Good | 46 | 13.1 |
| | Poor | 306 | 86.9 |
| Visiting a health facility/ doctor for any medical problem | Good | 108 | 30.7 |
| | Poor | 244 | 69.3 |
| Checking of blood pressure | Good | 100 | 28.4 |
| | Poor | 252 | 71.6 |
| Checking of blood sugar | Good | 71 | 20.2 |
| | Poor | 281 | 79.8 |
| Checking weight | Good | 134 | 38.1 |
| | Poor | 218 | 61.9 |

Ninety eight percent of the respondents did not have balanced diet, breakfast mainly consisted of milk tea and bread, lunch meals consisted of a mixture of beans and maize or rice and beans and the evening meal was either mashed potatoes with pumpkin leaves or maize meal with kales and they mainly relied on the small scale farming for their food. About 178 (50%) said they try to ensure that they incorporate vegetables in their meals and only 25 (7.1) eat fruits proactively, an important source of vitamins. These results are consistent with finding of a local study where 78% of the study participants had poor dietary practices (Maina *et al.*, 2011).

Majority of the respondents 306 (86.9%) demonstrated poor practices in proactively seeking for advice on diet, this could be attributed to low awareness levels in the cause of diabetes as well as impact of lifestyle choices on health status as revealed in both the FGDs and KII. In addition, majority 252 (71.6%) of the respondents had poor practices in relation to checking their blood pressure, 281 (79.8%) had never checked their blood sugar level, 218 (61.9%). Thirty eight point one percent of the respondents indicated that they know their weight and 30.7% had a good practice in seeking health care services. The above findings are consistent to the local study by Maina *et al.*, 2011 where by over 80% of the respondents did not monitor their weights.

Both FGD and KII revealed that the participants cited costs as one of the barriers to accessing health care services with an average health care visit costing five hundred (Kshs 500/=) Kenya

Shillings, doctor's consultation (Kshs 100/=), laboratory (Kshs 200/=) and Medicines (Kshs 300/=). The other challenge was presence of long queues and lack of medicines in the public facility.

5.5 Results of Cross Tabulation and Regression Analysis

The fourth objective of the study was to determine factors that influencing diabetes knowledge, attitude and practices amongst the community members. The researcher employed cross-tabulation and logistic regression analysis.

Cross tabulation, also known as contingency tables analysis was preferred as it is mostly used to analyze categorical (numerical) data. Logistic regression analysis was carried out to determine the effect of each independent variable on the outcome while controlling for other variables.

In the model,

- a) The Wald statistic for a coefficient is the square of the result of dividing the coefficient by its standard error; this quantity is distributed as chi-squared.
- b) $\text{Exp}(B)$ – is the estimated odds ratio

The results of the cross tabulation and logistic regression analysis are presented in the following pages.

5.5.1 Relationship between Demographics Characteristics and Diabetes Knowledge

The study sought to determine if there was any relationship between the following socio-demographic characteristics (Age, marital status and level education) which are independent variables with diabetes knowledge (our dependent variables) using the cross tabulation and logistic regression analysis model.

The findings of this analysis are presented in table 12(a) and 12(b).

Table 12 (a): Cross-tabulation analysis between demographic characteristics and diabetes knowledge

| Socio-demographic characteristic | Inadequate knowledge | Adequate knowledge | Percentage of adequate knowledge | χ^2 | p-value |
|----------------------------------|----------------------|--------------------|----------------------------------|----------|---------|
| Age (Years) | | | | | |
| <20 (n=53) | 45 | 8 | 15.1 | 18.059 | 0.01 |
| 21 – 30 (n=109) | 85 | 24 | 22 | | |
| 31 – 40 (n=82) | 56 | 26 | 31.7 | | |
| 41 – 50 (n=51) | 26 | 25 | 49 | | |
| 51 – 60 (n=26) | 15 | 11 | 42.3 | | |
| 61 – 70 (n=16) | 12 | 4 | 25 | | |
| >70 (n=15) | 12 | 3 | 20 | | |
| Total (n=352) | | | | | |
| Marital Status | | | | | |
| Married (n=227) | 152 | 75 | 33 | 5.902 | 0.019 |
| Single (n=125) | 99 | 26 | 20.8 | | |
| Total (n=352) | | | | | |
| Education Level | | | | | |
| No Education (n=10) | 10 | 0 | 0 | 12.318 | 0.008 |
| Primary Education (n=138) | 103 | 35 | 25.36 | | |
| Secondary Education (n=170) | 121 | 49 | 28.82 | | |
| Post-Secondary Education (n=34) | 17 | 17 | 50 | | |
| Total (n=352) | | | | | |

From the above table, knowledge scores were first determined by taking the number of correct responses for each respondent, and then the total number of respondents that had inadequate and adequate knowledge was determined and entered into the model. The percentage of participants with adequate knowledge ranged between 15% and 49% between the different age groups, this forms 28.7% of the participants with adequate knowledge compared to 71.3% with inadequate knowledge. The Chi-square statistic showed a significant relationship between age and diabetes knowledge ($\chi^2=18.059$ and $p= 0.01$) at 0.05 level of significance.

Marital status was cross tabulated against diabetes knowledge (adequate and inadequate knowledge), the percentage of respondents who were married had better knowledge (adequate) than those that were single - not married, separated or widows/widowers (33% vs 20.8%). The chi-square statistic showed significant relationship between knowledge and marital status ($\chi^2=5.902$ and $p=0.019$) at 0.05 level of significance.

Participants' education level was also cross tabulated with diabetes knowledge. The percentage of respondents with adequate knowledge on what is diabetes, ranged between 0% and 28.8%; overall, those with inadequate knowledge were more than those with adequate knowledge (71.3% vs 28.7%). The Chi-square statistic showed there is a statistically significant relationship between education and diabetes knowledge ($\chi^2=12.318$ and $p=0.008$) at 0.05 level of significance.

Logistic regression analysis was carried out to determine the effect of each independent variable on the outcome while controlling for other variables. See below results:

Table 12 (b) Logistic regression analysis between demographic characteristics and diabetes knowledge

| Variables in the Equation | | | | | | |
|---------------------------|--------|------|--------|----|------|--------|
| | B | S.E. | Wald | df | Sig. | Exp(B) |
| Marital status | .646 | .271 | 5.692 | 1 | .017 | 1.909 |
| Education level | .743 | .192 | 15.034 | 1 | .000 | 2.102 |
| Age | .024 | .007 | 10.616 | 1 | .001 | 1.024 |
| Constant | -4.842 | .843 | 33.009 | 1 | .000 | .008 |

When individual demographic variables (age, marital status and education) were modeled against diabetes knowledge, all the independent variables were found to be statistically significant to diabetes knowledge.

5.5.2 Relationship between Demographics Characteristics and Attitude towards Diabetes

The study sought to determine if there was any relationship between the following socio-demographic characteristics (Age, marital status and level education); these were the independent

variables with attitude towards diabetes - our dependent variable using cross tabulation and regression analysis model.

The findings of these analyses are presented in table 13(a) and 13 (b).

Table 13 (a) Cross tabulation analysis between demographic characteristics and attitude towards diabetes

| Socio-demographic characteristic | Negative attitude | Positive attitude | Percentage of positive attitude | χ^2 | p-value |
|----------------------------------|-------------------|-------------------|---------------------------------|----------|---------|
| Age (Years) | | | | | |
| <20 (n=53) | 3 | 50 | 94.3 | 51.010 | 0.00 |
| 21 – 30 (n=109) | 8 | 101 | 92.7 | | |
| 31 – 40 (n=82) | 4 | 78 | 95.1 | | |
| 41 – 50 (n=51) | 5 | 46 | 90.2 | | |
| 51 – 60 (n=26) | 4 | 22 | 84.6 | | |
| 61 – 70 (n=16) | 9 | 7 | 43.8 | | |
| >70 (n=15) | 10 | 5 | 33.3 | | |
| Total (n= 352) | | | | | |
| Marital Status | | | | | |
| Married (n=227) | 24 | 203 | 89.4 | 1.610 | 0.235 |
| Single (n=125) | 119 | 106 | 84.8 | | |
| Total (n=352) | | | | | |
| Education Level | | | | | |
| No Education (n=10) | 9 | 1 | 10 | 62.69 | 0.00 |
| Primary Education (n=138) | 20 | 118 | 85.5 | | |
| Secondary Education (n=170) | 11 | 159 | 93.5 | | |
| Post-Secondary Education (n=34) | 3 | 31 | 91.2 | | |
| Total (n=352) | | | | | |

The attitude of the respondents were analyzed individually and rated as either positive or negative, thereafter all the positive and negative attitude were added to give the total number of respondents with positive attitude while those with negative attitude.

From the above table 13(a), the percentage of the respondents with positive attitude towards prevention of diabetes was ranging from 33.3% to 95.1% in the different age groups. The Chi-

square statistic showed a significant relationship between age and attitude towards diabetes ($\chi^2=51.00$ and $p= 0.00$) at 0.05 level of significance.

Marital status was cross tabulated against attitude; 89.4% of participants with positive attitude were married respondents compared to 84.8% who were single. However, there was no statistically significant association between marital status and attitude towards diabetes ($\chi^2=1.61$ and $p= 0.235$) at 0.05 level of significance.

Participants' education level was also cross tabulated with attitude towards diabetes. The percentage of respondents with positive knowledge, ranged between 10% and 93.5%. The Chi-square statistic showed a significant relationship between education and attitude towards diabetes ($\chi^2=62.69$ and $p= 0.00$) at 0.05 level of significance.

Logistic regression analysis was carried out between attitude (positive and negative) and the different socio-demographic variables, below table 13(b) presents the results of the regression analysis.

Table 13 (b) Logistic regression analysis between demographic characteristics and attitude towards diabetes

| Variables in the Equation | | | | | | |
|---------------------------|-------|-------|--------|----|------|--------|
| | B | S.E. | Wald | Df | Sig. | Exp(B) |
| Marital status | .380 | .375 | 1.026 | 1 | .311 | 1.462 |
| Education level | .691 | .288 | 5.777 | 1 | .016 | 1.996 |
| age | -.049 | .010 | 23.140 | 1 | .000 | .952 |
| Constant | 1.647 | 1.113 | 2.189 | 1 | .139 | 5.191 |

When individual demographic variables (age, marital status and education) were modeled against attitude towards diabetes, all the independent variables were found to be statistically significant to diabetes knowledge except for marital status.

5.5.3 Relationship between demographics characteristics and practices to prevent diabetes

The study sought to determine if there was any relationship between the following socio-demographic characteristics (Age, marital status and level education) with practices to prevent diabetes using cross tabulation and logistic regression analysis.

The findings of this analysis are presented in table 14 (a) and 14 (b)

Table 14 (a) Cross tabulation analysis between demographic characteristics and practices

| Socio-demographic characteristic | Good practices | Poor practices | Percentage of good practices | χ^2 | p-value |
|----------------------------------|----------------|----------------|------------------------------|----------|---------|
| Age (Years) | | | | | |
| <20 (n=53) | 46 | 7 | 86.8 | 26.218 | 0.00 |
| 21 – 30 (n=109) | 97 | 12 | 88.9 | | |
| 31 – 40 (n=82) | 58 | 24 | 70.7 | | |
| 41 – 50 (n=51) | 36 | 15 | 70.5 | | |
| 51 – 60 (n=26) | 18 | 8 | 69.2 | | |
| 61 – 70 (n=16) | 8 | 8 | 50 | | |
| >70 (n=15) | 7 | 8 | 46.7 | | |
| Total (n=352) | | | | | |
| Marital Status | | | | | |
| Married (n=227) | 167 | 60 | 73.57 | 3.519 | 0.039 |
| Single (n=125) | 103 | 22 | 82.4 | | |
| Total (n=352) | | | | | |
| Education Level | | | | | |
| No Education (n=10) | 6 | 4 | 60 | 7.914 | 0.48 |
| Primary Education (n=138) | 97 | 41 | 70.2 | | |
| Secondary Education (n=170) | 140 | 30 | 87.5 | | |
| Post-Secondary Education (n=34) | 27 | 7 | 79.4 | | |
| Total 352 | | | | | |

From the above table 14(a), the percentage of the participants with good practices ranged from 50% to 88.9% in the different age sets. The Chi-square statistic showed a significant relationship between age and practices towards prevention of diabetes (χ^2 26.2 and $p= 0.00$) at 0.05 level of significance.

Cross tabulation between marital status and practices, the percentage of respondents that demonstrated good practices ranged from 73% to 82.4%. There was a statistically significant association between marital status and attitude towards diabetes ($\chi^2=3.512$ and $p= 0.039$) at 0.05 level of significance.

Sixty to 87.5% of the respondents amongst the different education groups demonstrated good practices towards preventing diabetes. However, there is no statistically significant association between level of education and practices to prevent diabetes ($\chi^2=7.914$ and $p= 0.48$) at 0.05 level of significance.

Results of the logistic regression are presented in table 14(b) below.

Table 14 (b) Logistic regression analysis between demographic characteristics and practices

| Variables in the Equation | | | | | | |
|---------------------------|--------|------|--------|----|------|--------|
| | B | S.E. | Wald | df | Sig. | Exp(B) |
| Marital Status | .527 | .294 | 3.218 | 1 | .073 | 1.693 |
| education | -.189 | .202 | .875 | 1 | .350 | .828 |
| age | .032 | .008 | 17.029 | 1 | .000 | 1.032 |
| Constant | -2.760 | .848 | 10.587 | 1 | .001 | .063 |

When individual demographic variables (age, marital status and education) were modeled against practices towards diabetes, all the independent variables were found not to be statistically significant to diabetes knowledge except for age.

CHAPTER SIX DISCUSSION, CONCLUSION AND RECOMMENDATIONS

6.0 Introduction

This study sought to assess the level of a rural community awareness of diabetes and how this knowledge influenced their attitude and practices in prevention and control of the disease in Karatina, Nyeri County. This chapter discusses the summary of major findings of the study, relevant discussions, conclusions and the necessary recommendations.

6.1 Discussion

6.1.1 Respondents Characteristics

The mean age of study respondents was 38 years with the youngest respondents being 18 years and the oldest being 102 years. Majority of the respondents were Christians, married, and had children. The average number of children that the participating respondents had was 2 children.

The low average number of children could be as a result of government efforts to reviewing family planning policies, deepening education on various family planning methods, curbing early marriages, and ensuring the policy of compulsory primary and secondary education is fully implemented. Another reason that may perhaps explain the low average number of children is more women nowadays are entering income-generating activities thus staying away from home, and which eventually leads to less number of children (KIPRA, 2013).

Almost half of the respondents and their spouses had completed primary level of education, suggesting some literate community, with literacy here being defined as having attended school, regardless of the level of education attained (UNESCO, 2006).

This may be attributed to the commitment that education is a human right as enshrined in the Constitution (GoK, 2010), the Basic Education Act of 2013, and Sessional Paper No. 14 of 2012 on Reforming Education and Training Sectors in Kenya, provide for free and compulsory basic in pre-primary, primary and secondary levels (GoK, 2013).

Respondents interviewed in the qualitative component of the study noted that agriculture was the bastion of this community. Almost every family practiced farming, either on communal land or family land. Others rented parcels of land for cultivation, paying rent on them. The most frequently mentioned health issues affecting this community were high blood pressure, arthritis and diabetes while amongst the children, diarrheal diseases were frequent.

Majority of the respondents said they were not diabetic, and about a quarter said they have persons with diabetes in their households. Amongst those, that said they were diabetic, most were newly diagnosed (known diabetic for less than two years) and were given their diagnosis at Karatina sub county hospital a public facility.

6.1.2 Diabetes Knowledge

Majority of the respondents had limited knowledge of diabetes revealing serious deficiencies of this condition in a community said to be having the highest number of affected persons in the country. Almost half the number of respondents (43.7%) was unable to offer an elementary definition of the term diabetes, slightly more than half, (62.5%) thought that diabetes can be cured and an almost similar number (52.8%) did not know there is a genetic link. These results are similar to those reported in Oman (Al Shafae et al., 2008) and India Metropolis (Mohan *et al.*, 2005).

Further, 209 (59.4%) of the respondents did not know the cause(s) of diabetes, 195 (55.5%) did not know symptoms of diabetes and 324 (92.1%) did not know that if diabetes is not well managed it may eventually lead to some serious complications. These findings are similar to a previous local study done three years earlier whereby (71%) of respondents had poor knowledge on what diabetes is, (73.9%) could not correctly identify the probable causes of diabetes mellitus and (73.4%) had very little or no knowledge of complications of diabetes (Maina *et al.*,2011).

The failure to define diabetes, recognize its symptoms and its complications may reflect the general public's significant lack of knowledge about diabetes. This is likely to have negative repercussions, in terms of trying to control and prevent diabetes. This is supported by some studies that have found poor and low knowledge about diabetes prevention and control had led to wide spread of the disease (ADA, 2006; Dropkin 2010; MCDCP, 2006 and Nwankwo *et al.*, 2010).

6.1.3 Attitude

Majority of the respondents agreed that it is important for a diabetic patient to exercise, to follow a controlled diet and to maintain a healthy weight. Results further indicated that 66.2% of the respondents agreed that missing medicines for a diabetic person has negative effect on the disease control, while 77.3% agreed that regular visits to the health service providers enabled one to

control the disease by getting correct advice and clarification. These findings imply that the respondents had good attitude towards diabetes prevention and control practices.

6.1.4 Practices

Results indicated that the respondent had poor practices towards diabetes prevention and control. This was evidenced by results which indicated that the respondents did not have balanced diet while majority of the respondents never visited health centre for diet advice, never checked their blood pressure and never checked their blood sugar level.

6.1.5 Variable relationships

Cross tabulations of the various independent variables (demographic characteristics) against the dependent variables-knowledge, attitude and practices were examined for association,

Relationship between level of education and diabetes knowledge was statistically significant ($\chi^2=12.318$ and $p=0.08$) at 0.05 level of significance. Age and marital status were also statistically significant at ($\chi^2=18.059$ and $p=0.01$) and ($\chi^2=5.902$ and $p=0.019$) respectively at 0.05 level of significance.

A cross tabulation of demographics characteristics (age, education level and marital status) and attitude were also examined. The results indicated that there is significant relationship between age and education level and attitude at ($\chi^2=51.00$ and $p=0.00$) and ($\chi^2=1.61$ and $p=0.235$) at 0.05 level of significance. However, there was no statistical association between marital status and attitude towards diabetes ($\chi^2=1.61$ and $p=0.235$) at 0.05 level of significance.

Relationship between demographics characteristics (age, marital status and education level) and practices was explored. Age and marital status against practices were statistically significant, while education was not statistically significant in explaining self practices of diabetes prevention and control.

6.2 Conclusion

To know is to be empowered; hence patients with limited health literacy may have limited knowledge and understanding of health that reduces their autonomy in self care and decision making. In other words, knowledge about diabetes mellitus is a necessity for individuals and communities to take action to control the disease; this is supported by the success story in studies

done in Singapore whereby there was no difference between diabetics and non-diabetics, with good rate amongst the general public due to an aggressive diabetes education program (Tham *et al.*, 2004). The following are the conclusions that can be drawn from this study:

1. Majority of the respondents had low to moderate awareness about diabetes despite citing it as one of the key health issue in the community. However, this awareness has not led to any changes in the disease prevention because the respondents are not sufficiently equipped with the knowledge to comprehensively manage, prevent and control the disease
2. The low levels of education could be responsible for majority of the respondents having low to moderate level of awareness and self management practices of diabetes. Research has demonstrated an association between literacy and health related knowledge, self management behaviours and control of diabetes (Schillinger *et al.*, 2002)
3. The low level of community knowledge of diabetes reflects on the extent of health promotion for most chronic non-communicable diseases.
4. Education of patients, will improve compliance to treatments and leads to favorable treatment outcomes. This is due to the direct influence of knowledge on the attitude and practices of both the care giver and the patients.
5. Majority of the respondents had poor practices such as checking their blood glucose level, weight, eating balanced meals and visiting the doctor for regular check-ups. This implies that there is need to develop community based health promotion programs to bring about paradigm shifts that will promote healthily choices and behavior as well as understand the impact of culture and beliefs to these practices.
6. The low incomes suggest the respondents' inability or difficulties in meeting health care costs when they arise, this may explain the poor practice of visiting health facility for regular check-ups.

6.3 Recommendations

The following are the recommendations drawn from this study:

1. The government must take a lead in creating awareness about diabetes disease country wide and in the counties that are adversely affected. In addition to developing the Kenya national diabetes educators' manual, a community awareness program targeting rural and semi-urban communities should be developed using a multi-sectoral approach in order to address the knowledge gaps and influence behaviour towards diabetes prevention.
2. Karatina community and others in similar settings need to be sensitized on diabetes causes, complications and importance of regular testing using sustainable models such as

community health workers program. For motivation and sustainability purposes, the ministry of health should explore the possibility of establishing a rewarding system for the community health workers this can include ranking them through a crediting system and introducing awarding criteria to encourage continuous learning.

The study findings further suggest that patients with type 2 diabetes require reinforcement of knowledge through health communication materials developed in the local language to encourage them to understand their disease management better, for more appropriate self-care. This will encourage behaviour change through lifestyle modification.

3. Given the low and uncertain incomes characteristic among rural dwellers, free screening for chronic diseases should be availed to the residents by the county government to increase their knowledge level on diabetes status. This can be done in a similar manner to the ante natal care program targeting all government facilities right from level 2 health facilities.
4. In order to ensure that once a community member seeking for health care services is managed well right from the start, there is a need for an increase in the awareness of diabetes management and its complications in the primary healthcare sector especially at level two facilities such as dispensaries and health care centers due to their proximity to members of the public. Thus, continuous education on diabetes mellitus and its complications for primary healthcare providers should be accompanied by regular assessments on the knowledge level. Screening for diabetes is important, but equally crucial is patient education and counseling.

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APPENDICES

Appendix I: Approval letter by KNH/UON – ERC



UNIVERSITY OF NAIROBI
COLLEGE OF HEALTH SCIENCES
P.O. BOX 19676 Code 00202
Telegrams: unaioty
(254-020) 2716300 Ext. 44355

KNH/UON-ERC
Email: naiotah_erc@uonbi.ac.ke
Website: www.uonbi.ac.ke



KENYATTA NATIONAL HOSPITAL
P.O. BOX 20723 Code 00202
Tel: 726300 9
Fax: 726272
Telegrams: MEDSUP, Nairobi

Ref: KNH-ERC/A/55

Link: www.uonbi.ac.ke/activities/KNH/UoN

12th March 2014

Diana Ruchago
School of Public Health
College of Health Sciences
University of Nairobi



Dear Diana

RESEARCH PROPOSAL: KNOWLEDGE, ATTITUDE AND PRACTICES OF TYPE TWO DIABETES IN A RURAL COMMUNITY-KARATINA IN NYERI COUNTY, KENYA (P3/01/2014)

This is to inform you that the KNH/UoN Ethics & Research Committee (KNH/UoN-ERC) has reviewed and **approved** your above proposal. The approval periods are 12th March 2014 to 11th March 2015.

This approval is subject to compliance with the following requirements:

- Only approved documents (informed consents, study instruments, advertising materials etc) will be used
- All changes (amendments, deviations, violations etc) are submitted for review and approval by KNH/UoN ERC before implementation.
- Death and life threatening problems and severe adverse events (SAEs) or unexpected adverse events whether related or unrelated to the study must be reported to the KNH/UoN ERC within 72 hours of notification.
- Any changes, anticipated or otherwise that may increase the risks or affect safety or welfare of study participants and others or affect the integrity of the research must be reported to KNH/UoN ERC within 72 hours.
- Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period (*Attach a comprehensive progress report to support the renewal*)
- Clearance for export of biological specimens must be obtained from KNH/UoN-Ethics & Research Committee for each batch of shipment.
- Submission of an *executive summary* report within 90 days upon completion of the study. This information will form part of the data base that will be consulted in future when processing related research studies so as to minimize chances of study duplication and/or plagiarism.

For more details consult the KNH/UoN ERC website www.uonbi.ac.ke/activities/KNH/UoN.

Protect to Discover

Appendix II: Research Participation Consent form (English Version)

Study Title: Knowledge, Attitude and Practices of Type Diabetes in a Rural Community

Introduction

Hello. My name is Diana Ruchugo, a student at the University of Nairobi. I am conducting a research survey, as part of my course work, on knowledge, attitude and practices of diabetes. I would like your permission to interview you about your experiences about this disease. This consent form contains information about the survey I am conducting and will help you to decide whether or not you would like to participate. I will read some information to you so you may understand why I am asking to talk to you. Please ask me to explain anything you may not understand. After reading this to you, you can decide if you wish to answer the questions or not.

General Information about the Interview

I am conducting interviews with different members of this community on diabetes. Each interview will be conducted in a private setting. I will ask you questions about yourself and your experiences within your community.

Your part in the Interview

I am requesting you to take part in this interview, where you can tell me about yourself, especially with regard to matters on your level of awareness of diabetes management, self management practices, socioeconomic and cultural factors that affect diabetes management. I will not write your name on this paper. This interview will last for about twenty to thirty minutes.

Possible Risks/Benefits

If any question makes you feel uncomfortable or you wish not to answer, you will not be required to have an answer. I will use the information that you give me solely for my academic work. This information may also be used by policy makers to improve services in your community and the country at large. You will not receive any money or other compensation for participation in the study.

Ability to say NO

Remember, you do not have to answer any question you do not want to. You may also stop the interview at any time. This will not affect your ability to receive services or participate in any programs in the future. However, I would appreciate it if you answer the questions openly and honestly so that we can gain the views of members of the groups.

What will happen with the Information?

All the information that you provide will be considered private and confidential and will be used only for the purposes of this study. When the survey is finished, I will collect all the responses from all the participants I will have talked to and add them up. Any report from this study will not use your name or any other information that may identify you. You will be able to find out about the results by contacting me on the contact given below.

Confidentiality

If you agree to take part in this interview, the things you tell me will be confidential. That means they will be private between you and me. I am not going to write down your name. If you agree, you can indicate your agreement by signing below. Alternatively, I can sign to say that I have witnessed your agreement.

Contact

The researchers conducting this study are Diana Ruchugo and her assistant. You may contact the researchers at anytime. Questions regarding the rights of research subjects may be directed at the KNH/ UoN Ethics Review Committee.

After listening to this information, do you have any questions?

0=NO

1=YES (If Yes, record and respond to the questions)

Consent

I have read/ been explained to the above information and understand that this survey is voluntary and I may stop at any time and I hereby do agree/not agree to participate in this study.

Signature of Participant: Date:

Signature of the interviewer Date:

Thank You!

Appendix III: FOMU YA IDHINI YA KUHUSIKA KATIKA UTAFITI

Kichwa cha Utafiti: Elimu/Maarifa, Mtazamo na Desturi za Aina ya Ugonjwa wa Kisukari katika Jumua ya Mashambani

Utangulizi

Hujambo. Jina langu ni Diana Ruchugo, mwanafunzi katika Chuo Kikuu cha Nairobi. Nafanya uauaji wa utafiti, kama sehemu ya masomo yangu, juu ya elimu/maarifa, mtazamo na desturi za kisukari. Ningependa kupata ruhusa yako ya kukuhoji juu ya uzoefu wako juu ya ugonjwa huu. Fomu hii ya idhini ina taarifa juu ya utafiti huu ninaofanya na itakusaidia kuamua kama utapenda kuhusika au la. Nitakusomea baadhi ya taarifa ili uweze kuelewa ni kwa nini ninaomba kuzungumza nawe. Tafadhali niambie nikueleze chochote ambacho unaweza kukosa kuelewa. Baada ya kukusomea taarifa hiyo, unaweza kuamua kama unapenda kujibu haya maswali au la.

Taarifa ya Jumla Kuhusu Mahojiano

Ninafanya mahojiano na watu tofauti wa jumua hii juu ya kisukari. Kila mahojiano yatafanywa faraghani. Nitakuuliza maswali juu yako mwenyewe na uzoefu wako katika jumua yako.

Sehemu yako katika mahojiano

Ninakuomba uhusike katika mahojiano haya, ambapo unaweza kuniambia juu yako mwenyewe, hasa kuhusiana na kiwango chako cha ufahamu juu ya udhibiti wa kisukari, desturi zako za kudhibiti, mambo ya kijamii, kiuchumi na kitamaduni yanayoathiri udhibiti wa kisukari. Sitaandika jina lako juu ya karatasi hili. Mahojiano yatachukua kama dakika ishirini au thelathini hivi.

Hatari/Manufaa Yanayoweza Kupatikana

Kama swali lolote litakufanya ukose kuwa na uhuru au utamani kutolijibu, hutatakiwa kutoa jibu. Nitatumia taarifa utakazonipatia kwa masomo yangu peke yake. Taarifa hizi pia zinaweza kutumiwa na waundaji wa sera/polisi kuboresha huduma katika jumua yako na nchini kwa jumla. Hutapokea pesa zozote au malipo mengine yoyote kwa kuhusika katika utafiti huu.

Uwezo wa kusema LA

Kumbuka kwamba huna lazima ya kujibu swali lolote ambalo hutaki kulijibu. Pia unaweza kusitisha mahojiano wakati wowote. Jambo hili halitaathiri uwezo wako wa kupokea huduma au kuhusika katika ratiba zozote katika siku za usoni. Hata hivyo, nitafurahi ukijibu maswali waziwazi na kwa ukweli ili tupate maoni ya wanamakundi.

Taarifa zako zitafanywaje?

Taarifa zote utakazotoa zitachukuliwa kuwa za kibinafsi na siri na zitatumiwa kwa malengo ya utafiti huu peke yake. Utafiti huu utakapoisha, nitakusanya majibu yote kutoka kwa wahusika wote nitakaokuwa nimezungumza nao na kuzijumulisha. Ripoti yeyote kutoka kwa utafiti huu haitatumia jina lako au taarifa nyingine yoyote ambayo inaweza kukutambulisha. Utaweza kujua juu ya majibu kwa kuwasiliana nami kwa anwani uliyopewa hapo chini.

Usiri

Iwapo utakubali kuhusika katika mahojiano haya, mambo utakayoniambia yatakuwa siri. Yaani yatakuwa siri kati ya mimi na wewe. Sitaliandika jina lako. Kama utakubali, unaweza kuonyesha kukubali kwako kwa kutia sahihi hapo chini. Au naweza kutia sahihi kuonyesha kwamba nimeshuhudia kukubali kwako.

Anwani

Watu wanaofanya utafiti huu ni Diana Ruchugo na msaidizi wake. Unaweza kuwasiliana na watafiti hawa wakati wowote. Maswali kuhusu haki za mada za utafiti yanaweza kuelekezwa kwa KNH/ UoN Ethics Review Committee (Kamati ya Ukaguzi wa Maadili ya UoN).

Je, una maswali yoyote baada ya kusikiliza taarifa hii?

0=LA

1=NDIO (Kama ndivyo, rekodi na kujibu hayo maswali)

Idhini

Nimesoma/ Nimeelezwa taarifa ya awali na ninaelewa kwamba utafiti huu ni wa kujitolea na ninaweza kuacha/kusita wakati wowote na hapa ninakubali /sikubali kuhusika katika utafiti.

Sahihi ya Mhusika:Tarehe:.....

Sahihi ya mhojaji.....Tarehe:.....

Appendix IV: FOMU YA IDHINI YA KUHUSIKA KATIKA UTAFITI

RITWA RIA UTUIRIA: Ugi, murore na muikarire wa maundu megie murimu wa cukari icagi-ini.

Matema ma uthuthuria

Wi mweka, njitagwo Diana Ruchugo, na ndi murutwo university ya Nairobi. Ndireka utuiria ari gicunji kia githomo giakwa ngirongoreria ugi, muonere na muikarire wa murimu wa cukari. Ni ngwenda rutha ruaku ngurie ciuria ciigie murimu uyu. Fomu ino ina uhoro wa utuiria uria ndireka nani I uguguteithia gutua itua kana ni uguitikira gutema itemi. Ninguguthomera ni getha unyite gitumi kia gwaririe. ndaguthaitha unjire haria utaranyita. Thutha wa guguthomera ni ugutua itua kana ni ugucokia kana kwaga gucokia ciuuria ici.

Uhoru wigie uthuthuria uyu.

Ndiraka uthuthuria na andu ngurani itura ini riri uhoro wa murimu wa cukari. utwiria uyu ni ugwikwo na njira ya hitho. ni ngukuria ciuria cikwigie na ci igie itura riaku

Itemi riaku uthuthuria ini uyu.

Nindirakwihoya unyite itema hari uthuthuria uyu, na no unjire uhoro waku, na makiria uria uii iguru ria murimu wa cukari, maundu maria ungike wee maundu ma miikarire na ma unduire maria machungariria kubacirira murimu wa cukari. ndikwandika ritwa riaku karatathi gaka. utuiria uyu ukuoya ndagika mirongo iri kana mirong itatu.

Mogwati /mawega

Kiuria o giothe kingituma uuigwe utaiganire kana ndukwenda gucokia, ndurabatara gucokia. Ngutumira uhoro uria ukuhe ndiwiki mathomo ini makwa. Uhoro uyu no utumirwo ni atabania ni undu wa wagiriru wa itura na bururi wothe. ndukwamukiara mbecha kana marihi o mothe ni undu wa kunyita itemi uthuthuri-ini uyu

Uhoti wa kuuga aca

Ririkana tonginya ucokia kiuria o giothe uta kwenda. ningi no urugamie ucokia wa ciuria kahinda o gothe. undu uyu ndukugiria uhoti o wothe wa kwamukira utungata kana kunyita itemi mubango o wothe matuku maria me guka, una kuhana oro uguo ri ni ngucokia ngatho ungcokia ciuria na waragania ni getha tugie na mawoni ma o mundu ikundi-ini.

Uhoru uria ukuheana ugwikwo atia?

Uhoru o wothe ugutuhe ugukorwo uri wa hitho nene na ugutumika na gitumi kia uthuthuria uyu tu. Utuiria wathira ningwamukira macokio kuma kuri aria manyitite itemi na njokaniririe. Uhoro o

wothe kuma githomo giki,ndukumenyithania ritwa riaku kana undu wothe ugitume uemeyekana.No umenye maumirira kuhitukira njira ya kwaraniria iria iheanitwo haha muhuro.

Uhoru wa thiri

Ungitikira kinyita itemi uthuthuria uyu maundu maria ukunjira ni mathiri.Uguo nikuga ati ni mathiri yakwa nawe.Ndikwandiak rittwa riaku.ungitikira no wikire ngirimiti kihitukira tha-ini haha muhuro.na njira ingi no njikira thai-ini kuuga ndi maira ngirimitini -ino .

Njira ya kwaraniria

Athuthuria ni Diana Ruchugo na ateithiriria ake .No waranirie na athuthuria mahinda o mothe .Ciuria ciigie utuiria uyu no urongorerio kuri thibitari ya kinyatta na university ya Nairobi,Ethics Review Commitee

Thutha wa guthikirira uhoru uyu ,wina kiuria o giothe?

0=aca

1=ii (akorwo niguu andika na ucokie ciuria?)

Rutha

Nindathoma /na ndataririo uhoru uyu na ndamenya ati utuiria uyu ni wa kwi rutira nanondige kahinda o gothe nan i ndetikira /ndinetikira kunyita itemi ithomo riri.

Thaiini ya munyita itemi:mweri.....

.....

Thaini ya muria ciuriamweri:.....

.....

Ningatho!

Appendix V: Survey Form (English Version)

| | |
|-------------------------------|--|
| Form serial number | |
| Date of Interview | |
| Time Interview Started | |
| Time Interview Ended | |
| Village Name | |
| Gender of Respondent | |

SECTION ONE: BACKGROUND INFORMATION

| QUESTION | RESPONSES | | | | | | | | | | | | | | | | |
|---|--|------------------------|--|-----------------------------------|--|---------------------|--|-------------------------|--|-----------------------|--|-------------------|--|----------------------|--|---------------------|--|
| 1. How old are you?/ Age at last birthday | | | | | | | | | | | | | | | | | |
| 2. What is your education level? | <p><i>Please tick the appropriate answer</i></p> <table border="1"> <tr> <td>1.No formal education</td> <td></td> </tr> <tr> <td>2.Primary Incomplete</td> <td></td> </tr> <tr> <td>3.Primary complete</td> <td></td> </tr> <tr> <td>4.Secondary Incomplete</td> <td></td> </tr> <tr> <td>5. Secondary complete</td> <td></td> </tr> <tr> <td>6. Post Secondary</td> <td></td> </tr> <tr> <td>9. Refused to answer</td> <td></td> </tr> </table> | 1.No formal education | | 2.Primary Incomplete | | 3.Primary complete | | 4.Secondary Incomplete | | 5. Secondary complete | | 6. Post Secondary | | 9. Refused to answer | | | |
| 1.No formal education | | | | | | | | | | | | | | | | | |
| 2.Primary Incomplete | | | | | | | | | | | | | | | | | |
| 3.Primary complete | | | | | | | | | | | | | | | | | |
| 4.Secondary Incomplete | | | | | | | | | | | | | | | | | |
| 5. Secondary complete | | | | | | | | | | | | | | | | | |
| 6. Post Secondary | | | | | | | | | | | | | | | | | |
| 9. Refused to answer | | | | | | | | | | | | | | | | | |
| 3. What is your marital status? | <p><i>Please tick the appropriate answer</i></p> <table border="1"> <tr> <td>1.Single (not married)</td> <td></td> </tr> <tr> <td>2.Married</td> <td></td> </tr> <tr> <td>3.Separated</td> <td></td> </tr> <tr> <td>4.Widow/ widower</td> <td></td> </tr> <tr> <td>9.Refused to answer</td> <td></td> </tr> </table> | 1.Single (not married) | | 2.Married | | 3.Separated | | 4.Widow/ widower | | 9.Refused to answer | | | | | | | |
| 1.Single (not married) | | | | | | | | | | | | | | | | | |
| 2.Married | | | | | | | | | | | | | | | | | |
| 3.Separated | | | | | | | | | | | | | | | | | |
| 4.Widow/ widower | | | | | | | | | | | | | | | | | |
| 9.Refused to answer | | | | | | | | | | | | | | | | | |
| 4. What is your parenthood status? | <p><i>Please tick the appropriate answer</i></p> <table border="1"> <tr> <td>1.No Children</td> <td></td> </tr> <tr> <td>2. Children (State the number)</td> <td></td> </tr> <tr> <td>9.Refused to answer</td> <td></td> </tr> </table> | 1.No Children | | 2. Children (State the number) | | 9.Refused to answer | | | | | | | | | | | |
| 1.No Children | | | | | | | | | | | | | | | | | |
| 2. Children (State the number) | | | | | | | | | | | | | | | | | |
| 9.Refused to answer | | | | | | | | | | | | | | | | | |
| 5. What is the highest level of education that your partner/ spouse has attained? | <p><i>Please tick the appropriate answer</i></p> <table border="1"> <tr> <td>1. No education</td> <td></td> </tr> <tr> <td>2. Primary incomplete`</td> <td></td> </tr> <tr> <td>3. Primary complete</td> <td></td> </tr> <tr> <td>4. Secondary incomplete</td> <td></td> </tr> <tr> <td>5. Secondary complete</td> <td></td> </tr> <tr> <td>6. Post Secondary</td> <td></td> </tr> <tr> <td>9. Refused</td> <td></td> </tr> <tr> <td>111. Not Applicable</td> <td></td> </tr> </table> | 1. No education | | 2. Primary incomplete` | | 3. Primary complete | | 4. Secondary incomplete | | 5. Secondary complete | | 6. Post Secondary | | 9. Refused | | 111. Not Applicable | |
| 1. No education | | | | | | | | | | | | | | | | | |
| 2. Primary incomplete` | | | | | | | | | | | | | | | | | |
| 3. Primary complete | | | | | | | | | | | | | | | | | |
| 4. Secondary incomplete | | | | | | | | | | | | | | | | | |
| 5. Secondary complete | | | | | | | | | | | | | | | | | |
| 6. Post Secondary | | | | | | | | | | | | | | | | | |
| 9. Refused | | | | | | | | | | | | | | | | | |
| 111. Not Applicable | | | | | | | | | | | | | | | | | |
| 6. What is your current occupation? | <i>Please tick the appropriate answer</i> | | | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | |
|---|--|--------------------------------|--|------------------|--|-----------------------|--|---------------------------|--|------------------------|--|------------------------------|--|-----------------------|--|------------|--|--------------------|--|
| | <table border="1"> <tbody> <tr><td>1. Not employed</td><td></td></tr> <tr><td>2. Self-employed</td><td></td></tr> <tr><td>3. Employed part time</td><td></td></tr> <tr><td>4. Employed full time</td><td></td></tr> <tr><td>5. Small scale farming</td><td></td></tr> <tr><td>6. Work around the homestead</td><td></td></tr> <tr><td>7. Retired/ Pensioner</td><td></td></tr> <tr><td>9. Refused</td><td></td></tr> <tr><td>11. Not Applicable</td><td></td></tr> </tbody> </table> | 1. Not employed | | 2. Self-employed | | 3. Employed part time | | 4. Employed full time | | 5. Small scale farming | | 6. Work around the homestead | | 7. Retired/ Pensioner | | 9. Refused | | 11. Not Applicable | |
| 1. Not employed | | | | | | | | | | | | | | | | | | | |
| 2. Self-employed | | | | | | | | | | | | | | | | | | | |
| 3. Employed part time | | | | | | | | | | | | | | | | | | | |
| 4. Employed full time | | | | | | | | | | | | | | | | | | | |
| 5. Small scale farming | | | | | | | | | | | | | | | | | | | |
| 6. Work around the homestead | | | | | | | | | | | | | | | | | | | |
| 7. Retired/ Pensioner | | | | | | | | | | | | | | | | | | | |
| 9. Refused | | | | | | | | | | | | | | | | | | | |
| 11. Not Applicable | | | | | | | | | | | | | | | | | | | |
| 7. How much money do you make as wages on an average day? | <table border="1"> <tbody> <tr><td>1. Enter the estimate provided</td><td></td></tr> <tr><td>9. Refused</td><td></td></tr> <tr><td>11. Not Applicable</td><td></td></tr> </tbody> </table> | 1. Enter the estimate provided | | 9. Refused | | 11. Not Applicable | | | | | | | | | | | | | |
| 1. Enter the estimate provided | | | | | | | | | | | | | | | | | | | |
| 9. Refused | | | | | | | | | | | | | | | | | | | |
| 11. Not Applicable | | | | | | | | | | | | | | | | | | | |
| 8. How far is the nearest health centre from your home? | <table border="1"> <tbody> <tr><td>1. Enter the estimate provided</td><td></td></tr> <tr><td>9. Refused</td><td></td></tr> <tr><td>11. Not Applicable</td><td></td></tr> </tbody> </table> | 1. Enter the estimate provided | | 9. Refused | | 11. Not Applicable | | | | | | | | | | | | | |
| 1. Enter the estimate provided | | | | | | | | | | | | | | | | | | | |
| 9. Refused | | | | | | | | | | | | | | | | | | | |
| 11. Not Applicable | | | | | | | | | | | | | | | | | | | |
| 9. What is your religion? | <p><i>Please tick the appropriate answer</i></p> <table border="1"> <tbody> <tr><td>1. Christian</td><td></td></tr> <tr><td>2. Muslim</td><td></td></tr> <tr><td>3. Traditional</td><td></td></tr> <tr><td>4. Other (Kindly specify)</td><td></td></tr> <tr><td>9. Refused</td><td></td></tr> </tbody> </table> | 1. Christian | | 2. Muslim | | 3. Traditional | | 4. Other (Kindly specify) | | 9. Refused | | | | | | | | | |
| 1. Christian | | | | | | | | | | | | | | | | | | | |
| 2. Muslim | | | | | | | | | | | | | | | | | | | |
| 3. Traditional | | | | | | | | | | | | | | | | | | | |
| 4. Other (Kindly specify) | | | | | | | | | | | | | | | | | | | |
| 9. Refused | | | | | | | | | | | | | | | | | | | |
| 10. Do you have diabetes? | <p><i>Please tick the appropriate answer</i></p> <table border="1"> <tbody> <tr><td>1. Yes</td><td></td></tr> <tr><td>2. No</td><td></td></tr> <tr><td>3. I don't know</td><td></td></tr> <tr><td>9. Refused</td><td></td></tr> <tr><td>11. Not Applicable</td><td></td></tr> </tbody> </table> | 1. Yes | | 2. No | | 3. I don't know | | 9. Refused | | 11. Not Applicable | | | | | | | | | |
| 1. Yes | | | | | | | | | | | | | | | | | | | |
| 2. No | | | | | | | | | | | | | | | | | | | |
| 3. I don't know | | | | | | | | | | | | | | | | | | | |
| 9. Refused | | | | | | | | | | | | | | | | | | | |
| 11. Not Applicable | | | | | | | | | | | | | | | | | | | |
| <i>If the answer was NO for question 10, move to question 14</i> | | | | | | | | | | | | | | | | | | | |
| 11. If yes, how long have you had Diabetes? | <p><i>Please tick the appropriate answer</i></p> <table border="1"> <tbody> <tr><td>1. 0-2 years</td><td></td></tr> <tr><td>2. 3-5 years</td><td></td></tr> <tr><td>3. 5—9 years</td><td></td></tr> <tr><td>4. 9-12 years</td><td></td></tr> </tbody> </table> | 1. 0-2 years | | 2. 3-5 years | | 3. 5—9 years | | 4. 9-12 years | | | | | | | | | | | |
| 1. 0-2 years | | | | | | | | | | | | | | | | | | | |
| 2. 3-5 years | | | | | | | | | | | | | | | | | | | |
| 3. 5—9 years | | | | | | | | | | | | | | | | | | | |
| 4. 9-12 years | | | | | | | | | | | | | | | | | | | |

| | | |
|--|---|--|
| | 5. 12 years and above | |
| | 9. Refused | |
| | 111. Not Applicable | |
| 12. Which facility gave you this diagnosis? | <i>Please tick the appropriate answer</i> | |
| | 1. Karatina sub-county Hospital | |
| | 2. Nyeri County Hospital | |
| | 3. Health Center | |
| | 4. Private Hospital | |
| | 5. Faith based Hospital | |
| | 6. Alternative medicine practitioner/traditional healer | |
| | 7. Pharmacy | |
| | 8. Other (Kindly Specify) | |
| | 9. Refused | |
| 13. When you were first diagnosed what advice or treatment were you given? | <i>Please tick the appropriate answer</i> | |
| | 1. None | |
| | 2. Insulin Injections | |
| | 3. Oral Medication (tablets) | |
| | 4. Change of diet | |
| | 5. Lose weight | |
| | 6. Exercise | |
| | 9. Refused | |
| | 111. Not Applicable | |
| 14. Does any member of your household have diabetes? | <i>Please tick the appropriate answer</i> | |
| | 1. Yes | |
| | 2. No | |
| | 3. I don't know | |
| | 9. Refused | |
| | 111. Not Applicable | |
| <i>If the answer was not YES for question 14, move to question 16</i> | | |
| 15. If yes, how long has the person been a diabetic? | <i>Please tick the appropriate answer</i> | |
| | 1. 0-2 years | |
| | 2. 3-5 years | |
| | 3. 5—9 years | |
| | 4. 9-12 years | |

| | | | |
|--|-----------------------|--|--|
| | 5. 12 years and above | | |
| | 9. Refused | | |
| | 111. Not Applicable | | |

SECTION TWO: DIABETES KNOWLEDGE

16. What is diabetes?

| | |
|---|--|
| 1. A chronic disease in which blood glucose is too high because insulin is not produced or is insufficient. | |
| 2. A condition people get for not eating well | |
| 3. A condition rich people get because of drinking alcohol and eating nyama choma | |
| 4. A condition that causes weight loss | |
| 5. Is all the above descriptions | |
| 6. I don't know | |
| 9. Refused | |
| 111. Not Applicable | |

17. Is diabetes hereditary?

| | |
|---------------------|--|
| 1. Yes | |
| 2. No | |
| 3. I don't know | |
| 9. Refused | |
| 111. Not Applicable | |

18. Can diabetes be cured?

| | |
|---------------------|--|
| 1. Yes | |
| 2. No | |
| 3. I don't know | |
| 9. Refused | |
| 111. Not Applicable | |

19. The major cause of diabetes is?

| | |
|--|--|
| 1. Lifestyle changes such as reduced physical activity and changes in dietary habits | |
| 2. Eating Potatoes | |
| 3. Sin against God | |
| 4. HIV and TB | |
| 5. Vectors such as mosquitoes and jiggers | |
| 6. I don't know | |
| 9. Refused | |

| | | |
|---|--|--|
| 111.Not Applicable | | |
| 20. The symptoms of diabetes are? | | |
| 1. Tiredness, weight loss, increased thirst, frequent urination, blurred vision. | | |
| 2.Loss of hair, change in nail colour | | |
| 3. Frequent coughing and sneezing | | |
| 4. I don't know | | |
| 9.Refused | | |
| 111.Not Applicable | | |
| 21. Diabetes if not treated, it may cause... | | |
| 1. Tiredness, weight loss, increased thirst, frequent urination and blurred vision. | | |
| 2.Loss of hair, change in nail colour | | |
| 3. Serious complications such as amputations, stroke, kidney disease | | |
| 4. Frequent coughing and sneezing | | |
| 5.I don't know | | |
| 9.Refused | | |
| 111.Not Applicable | | |
| 22. The most accurate method of monitoring diabetes is | | |
| 1. Blood glucose monitoring | | |
| 2. Number of urges for urination | | |
| 3. Level of tiredness | | |
| 4. Use of thermometer | | |
| 5.I don't know | | |
| 9.Refused | | |
| 111.Not Applicable | | |
| 23. If you are a smoker or you take alcohol is it beneficial to stop? | | |
| 1. Yes | | |
| 2. No | | |
| 3.I don't know | | |
| 9.Refused | | |
| 111. Not Applicable | | |
| 24. What effect does fruit juice have on blood glucose? | | |
| 1. Don't Know | | |
| 2. Lowers it | | |
| 3. Raises it | | |
| 4.Has no effect | | |
| 5.Refused | | |
| 111. Applicable | | |

25. What effect does any other sickness have on blood glucose?

| | |
|------------------|--|
| 1. Don't Know | |
| 2. Lowers it | |
| 3. Raises it | |
| 4. Has no effect | |
| 5. Refused | |
| 111. Applicable | |

26. Do you know your body weight?

| | |
|---------------------|--|
| 1. Yes | |
| 2. No | |
| 3. I don't know | |
| 9. Refused | |
| 111. Not Applicable | |

SECTION THREE: ATTITUDE QUESTIONS

27. It is important that a diabetic patient exercises.

| | |
|----------------------|--|
| 1. Strongly Agree | |
| 2. Agree | |
| 3. Strongly disagree | |
| 4. Disagree | |
| 5. Neutral | |
| 9. Refused | |
| 111. Not Applicable | |

28. Someone with diabetes follow a controlled diet?

| | |
|----------------------|--|
| 1. Strongly Agree | |
| 2. Agree | |
| 3. Strongly disagree | |
| 4. Disagree | |
| 5. Neutral | |
| 9. Refused | |
| 111. Not Applicable | |

29. Should a diabetic person maintain a healthy weight?

| | |
|----------------------|--|
| 1. Strongly Agree | |
| 2. Agree | |
| 3. Strongly disagree | |

| | |
|---------------------|--|
| 4.Disagree | |
| 5.Netural | |
| 9.Refused | |
| 111. Not Applicable | |

30. Nutrition education is not required to achieve healthy eating in diabetes

| | |
|----------------------|--|
| 1. Strongly Agree | |
| 2. Agree | |
| 3. Strongly disagree | |
| 4.Disagree | |
| 5.Neutral | |
| 9.Refused | |
| 111. Not Applicable | |

31. Missing medicines for a diabetic person has negative effect on the disease control.

| | |
|----------------------|--|
| 1. Strongly Agree | |
| 2. Agree | |
| 3. Strongly disagree | |
| 4.Disagree | |
| 5.Neutral | |
| 9.Refused | |
| 111. Not Applicable | |

32. Regular visits to the health service providers enables one to control the disease by getting correct advice and clarification

| | |
|----------------------|--|
| 1. Strongly Agree | |
| 2. Agree | |
| 3. Strongly disagree | |
| 4.Disagree | |
| 5.Neutral | |
| 9.Refused | |
| 111. Not Applicable | |

33. Diabetes is a life sentence and it does not matter what lifestyle change one may introduce, the health status diminish overtime

| | |
|----------------------|--|
| 1. Strongly Agree | |
| 2. Agree | |
| 3. Strongly disagree | |
| 4.Disagree | |
| 5.Neutral | |

| | | |
|---------------------|--|--|
| 9.Refused | | |
| 111. Not Applicable | | |

SECTION FOUR: PRACTICES

34. What does the typical family breakfast, lunch and supper consist of?

| Breakfast | Lunch | Dinner |
|-----------|-------|--------|
| | | |

| | |
|-------------|--|
| Balanced | |
| Not Balance | |

35. Have ever visited any health center for advice on diet?

| | |
|------------------------|--|
| 1. Never | |
| 2. 1 month ago | |
| 3. More than 3 months | |
| 4.Can't remember | |
| 5.More than a year ago | |
| 9.Refused | |
| 111. Not Applicable | |

36. When was the last time you ever checked your blood pressure?

| | |
|------------------------|--|
| 1. Never | |
| 2. 1 month ago | |
| 3. More than 3 months | |
| 4.Can't remember | |
| 5.More than a year ago | |
| 9.Refused | |
| 111. Not Applicable | |

37. When was the last time you ever checked your blood sugar?

| | |
|------------------------|--|
| 1. Never | |
| 2. 1 month ago | |
| 3. More than 3 months | |
| 4.Can't remember | |
| 5.More than a year ago | |
| 9.Refused | |
| 111. Not Applicable | |

38. When was the last time you ever checked your weight?

| | |
|-------------------------|--|
| 1. Never | |
| 2. 1 month ago | |
| 3. More than 3 months | |
| 4. Can't remember | |
| 5. More than a year ago | |
| 9. Refused | |
| 111. Not Applicable | |

39. When was the last time you ever visited a doctor?

| | |
|-------------------------|--|
| 1. Never | |
| 2. 1 month ago | |
| 3. More than 3 months | |
| 4. Can't remember | |
| 5. More than a year ago | |
| 9. Refused | |
| 111. Not Applicable | |

Thank You for your participation in this survey

Appendix VI : KIAMBATISHO CHA PILI: FOMU YA UKAGUZI

| | |
|------------------------------------|--|
| Nambari Maalumu ya Fomu | |
| Tarehe ya Mahojiano | |
| Wakati Mahojiano Yalipoanza | |
| Wakati Mahojiano Yalipoisha | |
| Jina la Kijiji | |
| Jinsia ya Mhojiwa | |

Sehemu ya Kwanza: Taarifa za Usuli

1. Una miaka mingapi?/ Umri wa siku yako ya kuzaliwa ya mwisho

2. Kiwango chako cha elimu ni kipi?

| | |
|-------------------------------|--|
| 1. Sikusoma | |
| 2. Sikumaliza elimu ya msingi | |
| 3. Nilimaliza elimu ya msingi | |
| 4. Sikumaliza elimu ya upili | |
| 5. Nilimaliza elimu ya upili | |
| 6. Baada ya elimu ya upili | |
| 9. Alikataa kujibu | |

3. Je, ume(oa)olewa?

| | |
|-----------------------------|--|
| 1. Sina mwenzi (kapera) | |
| 2. Nime(oa)olewa | |
| 3. Tumetengana | |
| 4. Mjane mwanamke/mwanamume | |
| 9. Alikataa kujibu | |

4. Hali yako ya Uzazi ni ipi?

| | |
|-----------------------------|--|
| 1. Sina Watoto | |
| 2. Nina Watoto (sema idadi) | |
| 9. Alikataa kujibu | |

5. Kiwango cha juu Zaidi cha elimu alichopata mwenzako ni kipi?

| | |
|-------------------------------|--|
| 1. Hakusoma | |
| 2. Hakumaliza elimu ya msingi | |
| 3. Alimaliza elimu ya msingi | |
| 4. Hakumaliza elimu ya upili | |
| 5. Alimaliza elimu ya upili | |
| 6. Baada ya elimu ya upili | |
| 9. Alikataa kujibu | |
| 111. Hapa Halifai | |

6. Wakati huu unafanya kazi gani?

| | |
|----------------------------------|--|
| 1. Sina ajira | |
| 2. Nimejiajiri | |
| 3. Nimeajiriwa kwa muda maalumu | |
| 4. Nimeajiriwa muda wote | |
| 5. Ukulima wa kiwango kidogo | |
| 6. Ninafanya kazi hapo nyumbani | |
| 7. Nimestaafu/ Mpokeaji Pensheni | |
| 9. Alikataa kujibu | |
| 111. Hapa Halifai | |

7. Unapata mshahara wa shilingi ngapi kwa siku?

| | |
|---------------------------|--|
| 1. Jaza makisio uliyopewa | |
| 9. Alikataa kujibu | |
| 111. Hapa Halifai | |

8. Kuna umbali gani kutoka nyumbani kwako hadi kituo cha afya kilichokaribu zaidi?

| | |
|---------------------------|--|
| 1. Jaza makisio uliyopewa | |
| 9. Alikataa kujibu | |
| 111. Hapa Halifai | |

9. Dini yako ni ipi?

| | |
|-------------------------------------|--|
| 1. Mkristo | |
| 2. Muislamu | |
| 3. Dini ya Kienyeji | |
| 4. Nyingine (Tafadhali sema ni ipi) | |
| 9. Alikataa kujibu | |

9. Je, unaugua kisukari?

| | |
|--------------------|--|
| 1. Ndio | |
| 2. La | |
| 9. Alikataa kujibu | |
| 111. Hapa Halifai | |

10. Kama ni hivyo, umekuwa na kisukari kwa muda gani?

| | |
|----------------------|--|
| 1. Miaka 0-2 | |
| 2. Miaka 3-5 | |
| 3. Miaka 5—9 | |
| 4. Miaka 9-12 | |
| 5. Miaka 12 na zaidi | |
| 9. Alikataa kujibu | |
| 111. Hapa Halifai | |

11. Ni hospitali gani iliyokupa ubainifu huu?

| | |
|-------------|--|
| 1. Zahanati | |
|-------------|--|

| | |
|------------------------------------|--|
| 2. Kituo cha Afya | |
| 3. Hospitali ya Mkoa | |
| 4. Hospitali ya Marejeo | |
| 5. Hospitali ya Kibinafsi | |
| 6. Hospitali ya Dhehebu | |
| 7. Duka la Dawa | |
| 8. Nyingine(Tafadhali sema ni ipi) | |
| 9. Alikataa kujibu | |

12. Ulipofanyiwa ubainifu wa ugonjwa huu mara ya kwanza, ulipewa mawaidha au matibabu gani?

| | |
|---------------------------|--|
| 1. Sikupewa chochote | |
| 2. Sindano za Insulini | |
| 3. Dawa za Kumeza (tembe) | |
| 4. Kugeuza lishe | |
| 5. Kupunguza uzito | |
| 6. Kufanya mazoezi | |
| 10. Alikataa kujibu | |
| 111. Hapa Halifai | |

13. Je, kuna mtu yeyote mwenye katika jamaa yenu?

| | |
|--------------------|--|
| 1. Ndio | |
| 2. La | |
| 9. Alikataa kujibu | |
| 111. Hapa Halifai | |

14. Kama ni hivyo, mtu huyo ameugua kisukari kwa muda gani?

| | |
|-----------------------|--|
| 6. Miaka 0-2 | |
| 7. Miaka 3-5 | |
| 8. Miaka 5—9 | |
| 9. Miaka 9-12 | |
| 10. Miaka 12 na zaidi | |
| 9. Alikataa kujibu | |
| 111. Hapa Halifai | |

Sehemu ya pili: Elimu ya Kisukari

15. Kisukari ni nini?

| | |
|--|--|
| 7. Ugonjwa wa kuselelea ambao unasababishwa na sukari iliyo ndani ya damu kuwa juu sana kwa sababu mwili hautoi insulin au insulini unayotoa haitoshi. | |
| 8. Hali inayowashika watu kwa sababu ya kutokula vizuri | |
| 9. Hali ambayo matajiri huipata kwa sababu ya kunywa pombe na kula nyama choma | |

| | |
|---|--|
| 10. Hali inayomfanya mtu apunguze uzito | |
| 9. Alikataa kujibu | |
| 111. Hapa Halifai | |

16. Je, kisukari hurithiwa?

| | |
|--------------------|--|
| 1. Ndio | |
| 2. La | |
| 9. Alikataa kujibu | |
| 111. Hapa Halifai | |

17. Je, kisukari kinaweza kupona?

| | |
|--------------------|--|
| 1. Ndio | |
| 2. La | |
| 9. Alikataa kujibu | |
| 111. Hapa Halifai | |

18. Sababu kuu ya kisukari ni?

| | |
|--|--|
| 1. Mabadiliko ya mtindo wa maisha kama vile kupunguza shughuli, kutegemea usafiri wa magari na mabadiliko ya tabia za kula | |
| 2. Kumfanyia Dhambi Mungu | |
| 3. VVU na KK (TB) | |
| 4. Vectors kama vile mbu na funza | |
| 9. Alikataa kujibu | |
| 111. Hapa Halifai | |

19. Dalili za kisukari ni?

| | |
|---|--|
| 1. Uchovu, kupunguza uzito, kuzidiwa na kiu, haja ndogo ya kila mara, kutoona vizuri. | |
| 2. Kupoteza nywele, kucha kubadilika rangi | |
| 3. Kukohoa na kuchemua kila mara | |
| 9. Alikataa kujibu | |
| 111. Hapa Halifai | |

20. Kisukari kisipotibiwa kinaweza kusababisha..

| | |
|---|--|
| 1. Uchovu, kupunguza uzito, kuzidiwa na kiu, haja ndogo ya kila mara, kutoona vizuri. | |
| 2. Kupoteza nywele, kucha kubadilika rangi | |
| 3. Matatizo makali zaidi kama vile kukatwa viungo, kiharusi, na ugonjwa wa figo | |
| 4. Kukohoa na kuchemua kila mara | |
| 9. Alikataa kujibu | |
| 111. Hapa Halifai | |

21. Njia ya usahihi zaidi ya kufuatilia kisukari ni

| | |
|--------------------------------------|--|
| 1. Kufuatilia sukari katika damu | |
| 2. Mgonjwa husikia mkojo mara ngambi | |

| | |
|-----------------------|--|
| 3. Kiwango cha uchovu | |
| 4. Kutumia kipimajoto | |
| 9. Alikataa kujibu | |
| 111. Hapa Halifai | |

22. Iwapo wewe ni mvutaji sigara au ni mnywaji wa pombe ni vyema uache?

| | |
|--------------------|--|
| 1. Ndio | |
| 2. La | |
| 9. Alikataa kujibu | |
| 111. Hapa Halifai | |

23. Maji ya matunda yana athari gani juu ya sukari kwenye damu?

| | |
|-------------------------|--|
| 1. Sijui | |
| 2. Huipunguza | |
| 3. Huiongeza | |
| 4. Hayana athari yoyote | |
| 5. Alikataa kujibu | |
| 111. Hapa Halifai | |

24. Magonjwa mengine yoyote yana athari gani juu ya sukari kwenye damu?

| | |
|-------------------------|--|
| 1. Sijui | |
| 2. Huipunguza | |
| 3. Huiongeza | |
| 4. Hayana athari yoyote | |
| 5. Alikataa kujibu | |
| 111. Hapa Halifai | |

Sehemu ya Tatu: Maswali ya Kimtazamos

25. Ni muhimu kwamba mgonjwa wa kisukari afanye mazoezi.

| | |
|----------------------|--|
| 1. Ninakubali Kabisa | |
| 2. Ninakubali | |
| 3. Sikubali kabisa | |
| 4. Sikubali | |
| 9. Alikataa kujibu | |
| 111. Hapa Halifai | |

26. Mtu mwenye kisukari hufuata lische inayodhibitiwa?

| | |
|----------------------|--|
| 1. Ninakubali Kabisa | |
| 2. Ninakubali | |
| 3. Sikubali kabisa | |
| 4. Sikubali | |

| | |
|-------------------|--|
| 9.Alikataa kujibu | |
| 111. Hapa Halifai | |

27. Je, mtu wa kisukari anapaswa kudumisha uzito wa kiafya?

| | |
|----------------------|--|
| 1. Ninakubali Kabisa | |
| 2. Ninakubali | |
| 3. Sikubali kabisa | |
| 4.Sikubali | |
| 9.Alikataa kujibu | |
| 111. Hapa Halifai | |

28. Elimu ya lishe bora haihitajiki katika kumfanya mtu mwenye kisukari ale vizuri kiafya

| | |
|----------------------|--|
| 1. Ninakubali Kabisa | |
| 2. Ninakubali | |
| 3. Sikubali kabisa | |
| 4.Sikubali | |
| 9.Alikataa kujibu | |
| 111. Hapa Halifai | |

29. Kukosa madawa kwa mtu wa kisukari kuna athari mbaya juu ya udhibiti wa ugonjwa huu.

| | |
|----------------------|--|
| 1. Ninakubali Kabisa | |
| 2. Ninakubali | |
| 3. Sikubali kabisa | |
| 4.Sikubali | |
| 9.Alikataa kujibu | |
| 111. Hapa Halifai | |

30. Kutembelea vituo vinavyotoa huduma za afya humwezesha mtu kudhibiti ugonjwa huo kwa kupata mawaidha na ufafanuzi sahihi

| | |
|----------------------|--|
| 1. Ninakubali Kabisa | |
| 2. Ninakubali | |
| 3. Sikubali kabisa | |
| 4.Sikubali | |
| 9.Alikataa kujibu | |
| 111. Hapa Halifai | |

31. Kisukari ni kifungo cha maisha na haijalishi ni mabadiliko gani ya mtindo wa maisha mtu anaweza kuleta, hali ya afya hudidimia polepole kwa muda fulani

| | |
|----------------------|--|
| 1. Ninakubali Kabisa | |
| 2. Ninakubali | |
| 3. Sikubali kabisa | |

| | |
|-------------------|--|
| 4.Sikubali | |
| 9.Alikataa kujibu | |
| 111. Hapa Halifai | |

Sehemu ya Nne: Desturi

32. Kifungua kinywa, mlo wa mchana na mlo wa jioni wa jamaa kifani hujumuisha vitu gani?

| Kifungua Kinywa | Mlo wa Mchana | Mlo wa Jioni |
|-----------------|---------------|--------------|
| | | |

| | |
|--------------|--|
| Mlo Kamili | |
| Mlo Mpungufu | |

33. Ulipeza lini kupimwa shinikizo la damu yako?

| | |
|-----------------------------|--|
| 1. Sijawahi kamwe | |
| 2. Mwezi 1 uliopita | |
| 3. Zaidi ya miezi 3 | |
| 4.Sikumbuki | |
| 5.Zaidi ya mwaka 1 uliopita | |
| 9.Alikataa kujibu | |
| 111. Hapa Halifai | |

34. Ulipeza lini kupimwa sukari damuni mwako?

| | |
|-----------------------------|--|
| 1. Sijawahi kamwe | |
| 2. Mwezi 1 uliopita | |
| 3. Zaidi ya miezi 3 | |
| 4.Sikumbuki | |
| 5.Zaidi ya mwaka 1 uliopita | |
| 9.Alikataa kujibu | |
| 111. Hapa Halifai | |

35. Ulipeza lini kupimwa macho yako?

| | |
|---------------------|--|
| 1. Sijawahi kamwe | |
| 2. Mwezi 1 uliopita | |
| 3. Zaidi ya miezi 3 | |

| | |
|-----------------------------|--|
| 4.Sikumbuki | |
| 5.Zaidi ya mwaka 1 uliopita | |
| 9.Alikataa kujibu | |
| 111. Hapa Halifai | |

36. Ulipeza lini kumwona daktari?

| | |
|-----------------------------|--|
| 1. Sijawahi kamwe | |
| 2. Mwezi 1 uliopita | |
| 3. Zaidi ya miezi 3 | |
| 4.Sikumbuki | |
| 5.Zaidi ya mwaka 1 uliopita | |
| 9.Alikataa kujibu | |
| 111. Hapa Halifai | |

Asante sana

Appendix VII: KIKUYU QUESTIONNAIRE

| | |
|--------------------------------------|--|
| Namba ya fomu | |
| Mweri wa kurio ciuria | |
| Matha maria uria wa ciuria wambirie | |
| Matha maria uria wa ciuria wathirire | |
| Ritwa ria gichagi | |
| Umwiri wa mucokia wa ciuria | |

GACHUNJI KA MBERE: UHORO WI GATU

| CIURIA | MACOKIO | | | | | | | | | | | | | | |
|--|---|--------------------------------|--|------------------------------------|--|-----------------------------------|--|------------------------------------|--|--|--|-----------------------|--|-----------|--|
| 1. Wina miaka iigana?/wari na miaka iigana ria muico ukirikana muthenya wa guchiarwo | | | | | | | | | | | | | | | |
| 2. Ukinyite ha githomo giaku? | <p><i>Cokia uria kwagiriire</i></p> <table border="1"> <tr> <td>1.Ndiri na githomo gia thukuru</td> <td></td> </tr> <tr> <td>2.ndiarikiirie thukuru ya muthingi</td> <td></td> </tr> <tr> <td>3.Ni ndarikirie thuku ya muthingi</td> <td></td> </tr> <tr> <td>4.Ndiarikirie thukuru ya secondari</td> <td></td> </tr> <tr> <td>5. Ni ndikiikitie thukuru ya sekondari</td> <td></td> </tr> <tr> <td>6. mbere ya secondari</td> <td></td> </tr> <tr> <td>9. kurega</td> <td></td> </tr> </table> | 1.Ndiri na githomo gia thukuru | | 2.ndiarikiirie thukuru ya muthingi | | 3.Ni ndarikirie thuku ya muthingi | | 4.Ndiarikirie thukuru ya secondari | | 5. Ni ndikiikitie thukuru ya sekondari | | 6. mbere ya secondari | | 9. kurega | |
| 1.Ndiri na githomo gia thukuru | | | | | | | | | | | | | | | |
| 2.ndiarikiirie thukuru ya muthingi | | | | | | | | | | | | | | | |
| 3.Ni ndarikirie thuku ya muthingi | | | | | | | | | | | | | | | |
| 4.Ndiarikirie thukuru ya secondari | | | | | | | | | | | | | | | |
| 5. Ni ndikiikitie thukuru ya sekondari | | | | | | | | | | | | | | | |
| 6. mbere ya secondari | | | | | | | | | | | | | | | |
| 9. kurega | | | | | | | | | | | | | | | |
| 3. Uhoro wa kuhikania? | <p><i>Cokia uria kwagiriire</i></p> <table border="1"> <tr> <td>1.Ndihikite</td> <td></td> </tr> <tr> <td>2.Ndimuhiku</td> <td></td> </tr> <tr> <td>3.Nitwambite gutigana</td> <td></td> </tr> <tr> <td>4.Mutumia/ Muthuri wa ndigwa</td> <td></td> </tr> <tr> <td>9.kurega</td> <td></td> </tr> </table> | 1.Ndihikite | | 2.Ndimuhiku | | 3.Nitwambite gutigana | | 4.Mutumia/ Muthuri wa ndigwa | | 9.kurega | | | | | |
| 1.Ndihikite | | | | | | | | | | | | | | | |
| 2.Ndimuhiku | | | | | | | | | | | | | | | |
| 3.Nitwambite gutigana | | | | | | | | | | | | | | | |
| 4.Mutumia/ Muthuri wa ndigwa | | | | | | | | | | | | | | | |
| 9.kurega | | | | | | | | | | | | | | | |
| 4. Uhoro wa uciari waku ? | <p><i>Cokia uria kwagiriire</i></p> <table border="1"> <tr> <td>1.Ndiri ciana</td> <td></td> </tr> <tr> <td>2. Ndina ciana (ciana cigana)</td> <td></td> </tr> <tr> <td>9.kurega</td> <td></td> </tr> </table> | 1.Ndiri ciana | | 2. Ndina ciana (ciana cigana) | | 9.kurega | | | | | | | | | |
| 1.Ndiri ciana | | | | | | | | | | | | | | | |
| 2. Ndina ciana (ciana cigana) | | | | | | | | | | | | | | | |
| 9.kurega | | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | |
|---|--|-------------------|--|------------------------------------|--|-----------------------------------|--|------------------------------------|--|------------------------------------|--|------------------------------------|--|---------------------------------|--|------------------|--|-----------------|--|
| 5. Mwendwa waku akinyite githomo ha iguru? | <p><i>Cokia uria kwagiriire</i></p> <table border="1"> <tr><td>1. Ndathomete</td><td></td></tr> <tr><td>2. Ndarikiitie thukuru ya muthingi</td><td></td></tr> <tr><td>3. Nairikitie thukuru ya muthingi</td><td></td></tr> <tr><td>4. Ndarikitie thukuru ya secondari</td><td></td></tr> <tr><td>5. Niarikitie thukuru ya secondari</td><td></td></tr> <tr><td>6. Niakiritie thukuru ya secondari</td><td></td></tr> <tr><td>9. kurega thukuru</td><td></td></tr> <tr><td>111. hati ngonii</td><td></td></tr> </table> | 1. Ndathomete | | 2. Ndarikiitie thukuru ya muthingi | | 3. Nairikitie thukuru ya muthingi | | 4. Ndarikitie thukuru ya secondari | | 5. Niarikitie thukuru ya secondari | | 6. Niakiritie thukuru ya secondari | | 9. kurega thukuru | | 111. hati ngonii | | | |
| 1. Ndathomete | | | | | | | | | | | | | | | | | | | |
| 2. Ndarikiitie thukuru ya muthingi | | | | | | | | | | | | | | | | | | | |
| 3. Nairikitie thukuru ya muthingi | | | | | | | | | | | | | | | | | | | |
| 4. Ndarikitie thukuru ya secondari | | | | | | | | | | | | | | | | | | | |
| 5. Niarikitie thukuru ya secondari | | | | | | | | | | | | | | | | | | | |
| 6. Niakiritie thukuru ya secondari | | | | | | | | | | | | | | | | | | | |
| 9. kurega thukuru | | | | | | | | | | | | | | | | | | | |
| 111. hati ngonii | | | | | | | | | | | | | | | | | | | |
| 6. Urutaga wira uriku? | <p><i>Cokia uria kwagiriire</i></p> <table border="1"> <tr><td>1. Ndiri mwandike</td><td></td></tr> <tr><td>2. Wira wakwiandika</td><td></td></tr> <tr><td>3. Nyandikitwo mahinda</td><td></td></tr> <tr><td>4. Nyandikitwo biu</td><td></td></tr> <tr><td>5. Ndi murimi munini</td><td></td></tr> <tr><td>6. Ndutaga mucii-ini</td><td></td></tr> <tr><td>7. Gukinya miaka ya gutiga wira</td><td></td></tr> <tr><td>9. Kurega</td><td></td></tr> <tr><td>111. Hatingonii</td><td></td></tr> </table> | 1. Ndiri mwandike | | 2. Wira wakwiandika | | 3. Nyandikitwo mahinda | | 4. Nyandikitwo biu | | 5. Ndi murimi munini | | 6. Ndutaga mucii-ini | | 7. Gukinya miaka ya gutiga wira | | 9. Kurega | | 111. Hatingonii | |
| 1. Ndiri mwandike | | | | | | | | | | | | | | | | | | | |
| 2. Wira wakwiandika | | | | | | | | | | | | | | | | | | | |
| 3. Nyandikitwo mahinda | | | | | | | | | | | | | | | | | | | |
| 4. Nyandikitwo biu | | | | | | | | | | | | | | | | | | | |
| 5. Ndi murimi munini | | | | | | | | | | | | | | | | | | | |
| 6. Ndutaga mucii-ini | | | | | | | | | | | | | | | | | | | |
| 7. Gukinya miaka ya gutiga wira | | | | | | | | | | | | | | | | | | | |
| 9. Kurega | | | | | | | | | | | | | | | | | | | |
| 111. Hatingonii | | | | | | | | | | | | | | | | | | | |
| 7. Wonaga mbeba ciigana cia mucara o muthenya ? | <table border="1"> <tr><td>1. Ikira kigeri</td><td></td></tr> <tr><td>9. Kurega</td><td></td></tr> <tr><td>111. Hatingonii</td><td></td></tr> </table> | 1. Ikira kigeri | | 9. Kurega | | 111. Hatingonii | | | | | | | | | | | | | |
| 1. Ikira kigeri | | | | | | | | | | | | | | | | | | | |
| 9. Kurega | | | | | | | | | | | | | | | | | | | |
| 111. Hatingonii | | | | | | | | | | | | | | | | | | | |
| 8. Thibitari iria I hakuhi ii gatina kaigana atia kuma mucii? | <table border="1"> <tr><td>1. Ikira kigeri</td><td></td></tr> <tr><td>9. Kurega</td><td></td></tr> <tr><td>111. Hatingonii</td><td></td></tr> </table> | 1. Ikira kigeri | | 9. Kurega | | 111. Hatingonii | | | | | | | | | | | | | |
| 1. Ikira kigeri | | | | | | | | | | | | | | | | | | | |
| 9. Kurega | | | | | | | | | | | | | | | | | | | |
| 111. Hatingonii | | | | | | | | | | | | | | | | | | | |
| 9. Ndini yaku ni iriku? | <p><i>Cokia uria kwagiriire</i></p> <table border="1"> <tr><td>1. Mukristiano</td><td></td></tr> <tr><td>2. Muithiramu</td><td></td></tr> <tr><td>3. Munduire</td><td></td></tr> <tr><td>4. Ingi (gweta ni iriku)</td><td></td></tr> <tr><td>9. Kurega</td><td></td></tr> </table> | 1. Mukristiano | | 2. Muithiramu | | 3. Munduire | | 4. Ingi (gweta ni iriku) | | 9. Kurega | | | | | | | | | |
| 1. Mukristiano | | | | | | | | | | | | | | | | | | | |
| 2. Muithiramu | | | | | | | | | | | | | | | | | | | |
| 3. Munduire | | | | | | | | | | | | | | | | | | | |
| 4. Ingi (gweta ni iriku) | | | | | | | | | | | | | | | | | | | |
| 9. Kurega | | | | | | | | | | | | | | | | | | | |
| 10. ni ukoragwo na murimu wa cukari? | <p><i>Cokia uria kwagiriire</i></p> <table border="1"> <tr><td>1. ii</td><td></td></tr> </table> | 1. ii | | | | | | | | | | | | | | | | | |
| 1. ii | | | | | | | | | | | | | | | | | | | |

| | | |
|---|--|------------------------------|
| | 2.acA | |
| | 3. Ndiui | |
| | 9.Kurega | |
| | 111. Hatingonii | |
| Angikorwo icoki ni aca kiuria namba ikumi,thii namba ikumi na inya | | |
| 11. Angikorwo ni guo, ukoretwo na murimu wa cukari kahinda kaigana atia? | <i>Cokia uria kwagiriire</i> | |
| | 6. Miaka 0-2 | |
| | 7. Miaka 3-5 | |
| | 8. Miaka 5—9 | |
| | 9. Miaka 9-12 | |
| | 10. Miaka 12 na iguru | |
| | 9. Kurega | |
| | 111. Hatingonii | |
| 12. Wa thimiirwo ku murimu uyu? | <i>Cokia uria kwagiriire</i> | |
| | 1. Thibitari ya kaunti nini ya karatina | |
| | 2. Thibitari ya kaunti ya Nyeri | |
| | 3. Kuria guthimagirwo ugoma wa mwiri | |
| | 4. Thibitari ya mundu kiumbe | |
| | 5. Thibitari ya maundu ma witiko | |
| | 6. Ndawa mithemba ingi, murigitani kana murigitani wa ndawa cia kinduire | |
| | 7. Nduka ya ndawa | |
| | 8. Ingi(gweta) | |
| 9. Kurega | | |
| 13. Wathimirwo ria mbere ni waheirwo mataro kana ni urigitani uriku ? | <i>Cokia uria kwagiriire</i> | |
| | 1. Gutiri | |
| | 2. Cindano ya insulini | |
| | 3. Ndawa cia kunywa (mburugutu) | |
| | 4. Guchejia mirire | |
| | 5. Kuhuthia uritu | |
| | 6. Mathako ma mwiri | |
| | 10. Kurega | |
| | 111. Hatingonii | |
| | 14. Ni kuri mundu wa nyumba yanyu wina murimu wa cukari? | <i>Cokia uria kwagiriire</i> |
| 1. ii | | |
| 2. Aca | | |

| | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|--|--|--------------|--|--|--------------|--|--|--------------|--|--|---------------|--|--|-----------------------|--|--|-----------|--|--|-----------------|--|--|
| | 3. Ndiuii | | | | | | | | | | | | | | | | | | | | | | | |
| | 9.kurega | | | | | | | | | | | | | | | | | | | | | | | |
| | 111. Hatingonii | | | | | | | | | | | | | | | | | | | | | | | |
| Angikorwo icoki ni ii namba 14,thii namba 16 | | | | | | | | | | | | | | | | | | | | | | | | |
| 15. Angikorwo niguu mundu ucio akoretwo na murimu wa cukari kahinda kaigana atia? | <i>Cokia uria kwagiriire</i> <table border="1"> <tr> <td>1. 0-2 miaka</td> <td></td> <td></td> </tr> <tr> <td>2. 3-5 miaka</td> <td></td> <td></td> </tr> <tr> <td>3. 5—9 miaka</td> <td></td> <td></td> </tr> <tr> <td>4. 9-12 miaka</td> <td></td> <td></td> </tr> <tr> <td>5. 12 guthii na iguru</td> <td></td> <td></td> </tr> <tr> <td>9. kurega</td> <td></td> <td></td> </tr> <tr> <td>111. hatingonii</td> <td></td> <td></td> </tr> </table> | | | 1. 0-2 miaka | | | 2. 3-5 miaka | | | 3. 5—9 miaka | | | 4. 9-12 miaka | | | 5. 12 guthii na iguru | | | 9. kurega | | | 111. hatingonii | | |
| 1. 0-2 miaka | | | | | | | | | | | | | | | | | | | | | | | | |
| 2. 3-5 miaka | | | | | | | | | | | | | | | | | | | | | | | | |
| 3. 5—9 miaka | | | | | | | | | | | | | | | | | | | | | | | | |
| 4. 9-12 miaka | | | | | | | | | | | | | | | | | | | | | | | | |
| 5. 12 guthii na iguru | | | | | | | | | | | | | | | | | | | | | | | | |
| 9. kurega | | | | | | | | | | | | | | | | | | | | | | | | |
| 111. hatingonii | | | | | | | | | | | | | | | | | | | | | | | | |

GICHUNJI GIA KERI: UMENYO WA MURIMU WA CUKARI

16. Murimu wa cukari ni uriku?

| | |
|---|--|
| 1.Murimu utahonagwo tondu cukari wa thakame uri iguru tondu insulini ndirarutowo kana ndiraigana. | |
| 2.Undu andu magiaga niundu wa kwaga kuria wega | |
| 3.Undu itonga igiaga ni undu wa kunywa njohi na kuria nyama cia njino | |
| 4.Undu utumaga mundu ate uritu | |
| 5.Maundu mothe mataririo haha iguru | |
| 6.Ndiui | |
| 9. Kurega | |
| 111. Hatingonii | |

17.Murimu wa cukari ni wa gutiganirwo?

| | |
|-----------------|--|
| 1. ii | |
| 2. Aca | |
| 3. Ndiui | |
| 9.Kurega | |
| 111. Hatingonii | |

18.Murimu wa cukari no uhonwo?

| | |
|-----------------|--|
| 1. ii | |
| 2.Aca | |
| 3. Ndiui | |
| 9.Kurega | |
| 111. Hatingonii | |

19. Gitumi kinene kiria kirehaga murimu wa cukari ni kiriku?

| | |
|--|--|
| 1. Mucengerie wa muturiire ta kunyihia mwigariko wa mwiri na guchenjia mutugo wa murire. | |
| 2. Kuria iwaru | |

| | |
|---|--|
| 3.kwihiria NGAI | |
| 4. Murimu wa muingo na TB | |
| 5.Tutambi ta ta rwagi na ndutu | |
| 6.Ndiui | |
| 9.Kurega | |
| 111.Hatingonii | |
| 20. Ndriri cia murimu wa cukari? | |
| 1. kunogerera ,kunyihia uritu,kunyota muno,guthuguma kaingi kaingi na kwaga kuona wega. | |
| 2.kumunyuka njwiri ,na nduara gucujia rangi | |
| 3.K uhaya muno na gwathimura | |
| 4. Ndiui | |
| 9.Kurega | |
| 111.Hatingonii | |
| 21. Murimu wa cukari ungiaga guthondekwo ni uchungariria... | |
| 1. kunogerera ,kunyihia uritu,kunyota muno,guthuguma kaingi kaingi na kwaga kuona wega | |
| 2.kumunyuka njwiri na ndwara gucujia rangi | |
| 3.Maundu maritu ta kuregwo ciaga cia mwiri ,gukua ciaga kana murimu wa higo | |
| 4. Kuhaya muno na gwathimura | |
| 5.Ndiui | |
| 9.Kurega | |
| 111.hatingonii | |
| 22. Njira iria njega ya kubacirira murimu wa cukari | |
| 1. Githimi kia kubacirira cukari wa thakame | |
| 2. Maita ma guthii kahinda kanini | |
| 3. Githimi kia kunogerera | |
| 4. guhumira githimi kia urugari | |
| 5.Ndiui | |
| 9.Kurega | |
| 111.Hatingonii | |
| 23. Angikorwo ni unyuaga thigara kana kinyua njohi ni hari faita gutiga? | |
| 1. ii | |
| 2. Aca | |
| 3.Ndiui | |
| 9.Kurega | |
| 111. Hatingonii | |
| 24. Muhiho wa matunda ucungagiriria atia hari cukari wa thakame? | |
| 1. Ndiui | |

| | |
|-----------------------|--|
| 2. Guikurukia githimi | |
| 3. Kwa mbatia githimi | |
| 4.Hatiri undu wikaga | |
| 5.Kurega | |
| 111. Ni hangonii | |

25. Mirimu ingi icongagiriria atia cukari wa thakame?

| | |
|-----------------------|--|
| 1.Ndiuui | |
| 2. Guikurukia githimi | |
| 3. Kwa mbatia githimi | |
| 4.Hatiri undu wikaga | |
| 5.Kurega | |
| 111. Ni hangonii | |

26. Ni uii uritu waku wa mwiri?

| | |
|-----------------|--|
| 1. ii | |
| 2. Aca | |
| 3.Ndiuui | |
| 9.Kurega | |
| 111. Hatingonii | |

GICHUNJI GIA GATATU: CIURIA CIA MWONERE WA MAUNDU

27. He bata muruaru wa murimu wa cukari ake mathako ma mwiri?

| | |
|------------------------|--|
| 1. Ndetikira na hinya | |
| 2. Ni ndetikia | |
| 3. Ni ndarega na hinya | |
| 4.Ni ndarega | |
| 5. Kuiganania | |
| 9.kurega | |
| 111. Hatingonii | |

28. Mundu wina murimu wa cukari arumgirira murire mubaciriru?

| | |
|-------------------------|--|
| 1. Ni ndetikia na hinya | |
| 2. Ni ndetika | |
| 3. Ni ndarega na hinya | |
| 4.Ni ndarega | |
| 5. Kuiganania | |
| 9.Kurega | |
| 111. Hatingi ngonii | |

29. Mundu wina murimu wa cukari ni agiriirwo ni gukorwo na uritu wagiriire?

| | |
|-------------------------|--|
| 1. Ni ndetikia na hinya | |
| 2. Ni ndetikia | |
| 3. Ni ndarega na hinya | |
| 4. Ni ndarega | |
| 5. Kuiganania | |
| 9. Kurega | |
| 111. Hatingonii | |

30. Githomo kia murire gitiagirirwo gukinyanirio murire mwega murimu -ini uyu?

| | |
|-------------------------|--|
| 1. Ni ndetikia na hinya | |
| 2. Ni ndetikia | |
| 3. Ni ndarega na hinya | |
| 4. Ni ndarega | |
| 5. Kuiganania | |
| 9. Kurega | |
| 111. Hatingonii | |

31. Kwaga kunyua ndawa kwa mundu wina murimu uyu ni kurehaga machungiri matari mega kuri kugiriria murimu.?

| | |
|--------------------------|--|
| 1. Ni ndetikira na hinya | |
| 2. Ni ndetikira | |
| 3. Ni ndarega na hinya | |
| 4. Ni ndarega biu | |
| 5. Kuiganania | |
| 9. Kurega | |
| 111. Hatingonii | |

32. Gucerera arigitani maita maingi ni gutumaga mundu agiririe murimu ni undu wa gutarwo na kuheo kirra kiria kIagiriire.

| | |
|--------------------------|--|
| 1. Nindetikia na hinya | |
| 2. Ni ndetikira | |
| 3. Ni ndaregana na hinya | |
| 4. ni ndarega | |
| 5. Kuiganania | |
| 9. kurega | |
| 111. hatingonii | |

33. murimu wa cukari ni kioho kia muturire na gutimakanagia muturiire uria mundu akugarurira ,ugima wa

mwiri uthiaga ukhagaa uuria mahind marathii

| | |
|--------------------------|--|
| 1. Nindetikira na hinya | |
| 2. Ni ndetikira | |
| 3. Ni ndaregana na hinya | |
| 4. ni ndarega | |
| 5. Kuiganania | |
| 9. Kurega | |
| 111. Hatingonii | |

GICUNJI GIA KANA: MWIKIRE WA MAUNDU

34. Mirire ya irio cai kimucii irio cia rucini,ria cia tha mugwanja na irio cia hahwaini iharagirio atia?

| Irio cia rucini | Irio cia tha mugwanja | Irio cia hwai-ini |
|-----------------|-----------------------|-------------------|
| | | |

| | |
|-----------------------|--|
| Iriu nginyaniru | |
| Iriu itari nginyaniru | |

35. Uri wacerera arigitani makuhe utaro wigie mirire?

| | |
|-----------------------------|--|
| 1. Ndirindathii | |
| 2. Mweri umwe muthiru | |
| 3. Makiria ma mieri itatu | |
| 4. Ndingirikana | |
| 5. Makiria ma mwaka muthiru | |
| 9. Kurega | |
| 111. hatingonii | |

36. Ni ri kwari Ihinda ria muico kurorwo kuhaica thakame?

| | |
|----------------------------|--|
| 1. Ndirindarorwo | |
| 2. mweri muthiru | |
| 3. Makiria ma mieri mitatu | |
| 4. ndingirikana | |
| 5. makiria ma mwaka umwe | |

| | |
|-----------------|--|
| 9.kurega | |
| 111. hatingonii | |

37. Ni ri muicho warorirwo sukari wa thakame?

| | |
|---------------------------|--|
| 1. Ndiri ndarorwo | |
| 2. Mweri umwe muthiru | |
| 3. Makiria ma mieri itatu | |
| 4.Ndingirikana | |
| 5.Makiria ma mwaka umwe | |
| 9.kurega | |
| 111. Hatingonii | |

38. ni ri ria muico warorirwo uritu wa mwiri?

| | |
|---------------------------|--|
| 1. Ndirindarorwo | |
| 2. Mweri umwe muthiru | |
| 3. Makiria ma mieri itatu | |
| 4.Ndingirikana | |
| 5.Makiria ma mwaka umwe | |
| 9.Kurega | |
| 111. Hatingonii | |

39. Ni ri ria muico wa cereire murigitani?

| | |
|---------------------------|--|
| 1. Ndirindathii | |
| 2. Mweri umwe muthiru | |
| 3. Makiria ma mieri itatu | |
| 4.Ndingirikana | |
| 5.Makiria ma mwaka umwe | |
| 9.kurega | |
| 111. Hatingonii | |

Ni ngatho ni unyitaniri waku uthuthuria ini uyu.

Appendix VIII: Informed consent form for both FGD and In-Depth Interview

TITLE: Knowledge, Attitude and Practices of Type Diabetes in a Rural Community

Introduction

Hello. My name is Diana Ruchugo, a student at the University of Nairobi and my colleague is _____. I am conducting a research survey, as part of my course work, on knowledge, attitude and practices of diabetes within your community. I would like your permission to interview you about your experiences with regard to diabetes. This consent form contains information about the survey I am conducting and will help you to decide whether or not you would like to participate. I will read some information to you so you may understand why I am asking to talk to you. Please ask me to explain anything you may not understand. After reading this to you, you can decide if you wish to answer the questions or not.

General Information about the Interview

I am conducting interviews with different members of this community on diabetes. This focus group discussion involves key leaders in the community. I will ask you questions about yourself and your experiences within your community.

Your part in the Interview

I am requesting you to take part in this interview, where you can tell me about yourself, especially with regard to matters on your level of awareness of diabetes management, self management practices, socioeconomic and cultural factors that affect diabetes management. I will not write your name on this paper. This interview will last for about sixty minutes.

Possible Risks/Benefits

If any question makes you feel uncomfortable or you wish not to answer, you will not be required to have an answer. I will use the information that you give me solely for my academic work. This information may also be used by policy makers to improve services in your community and the country at large. You will not receive any money or other compensation for participation in the study.

Ability to say NO

Remember, you do not have to answer any question you do not want to. You may also stop the interview at any time. This will not affect your ability to receive services or participate in any

programs in the future. However, I would appreciate it if you answer the questions openly and honestly so that we can gain the views of members of the groups.

What will happen with the Information?

All the information that you provide will be considered private and confidential and will be used only for the purposes of this study. When the survey is finished, I will collect all the responses from all the participants I will have talked to and add them up. Any report from this study will not use your name or any other information that may identify you. You will be able to find out about the results by contacting me on the contact given below.

Procedure

This is going to take the form of a discussion. One of us will ask the questions, as the other takes down some notes. It may not be possible for us to capture everything that you say. We will therefore need your permission to use a recorder. With this, we can capture everything you say then play it back slowly later to make sure we take note of everything you tell us. After retrieving the information, the tapes will be destroyed. Again, these tapes are going to be used purely for this research study and will not be shared with any other parties. Please be very audible as you speak. We also need to allow only one person to speak at a time. Please ask for clarification for any questions that you do not understand. There is also no right or wrong answer. Each of your answers or remarks is important so please feel free to share with us each and everything that you may have.

Confidentiality

If you agree to take part in this interview, the things you tell me will be confidential. That means they will be private between us in this group. I am not going to write down your name. If you agree, you can indicate your agreement by signing below. Alternatively, I can sign to say that I have witnessed your agreement.

Contact

The researchers conducting this study are Diana Ruchugo and her assistant. You may contact the researchers at anytime. Questions regarding the rights of research subjects may be directed at the KNH/ UoN Ethics Review Committee.

After listening to this information, do you have any questions?

0=NO

1=YES (Pass the registration form round for every participant to sign)

Name of moderator _____

Name of note _____

Appendix IX: Focus Group Discussion Guide

Issue 1: What is your current experience living in this community?

Probe for the respondents' everyday experiences.

- What are your main occupations?
- What role does farming play in your lives?
- What are the experiences of your families living in this community?
- For those who are married, are your spouses engaged in any form of employment?
- How much on average do you earn as wages per day?
- Are you able to provide for the basic needs of your families?

Issue 2: What is your health experiences living in this community?

Probe for the health experiences.

- What are the most common diseases, infections or conditions that you have to deal with in this community?
- How far away is the nearest health facility? (In terms of distance in Km's and time taken to access the facility – get this estimate from every participant).
- How much, on average do you spend per visit to this facility?
- How many times in a month or year are you likely to visit this health facility for your own needs or while taking your children?

Issue 3: What is diabetes?

Probe for knowledge

- High Sugar
- Amputation of the leg
- An expensive disease with cure
- Chronic disease without cure

Issue 4: What is it like living with diabetes?

Probe for:

- Diet and exercise
- Home glucose monitoring
- Taking medications
- Side effects of medications
- Knowledge of diabetes

- Attitude towards diabetes
- Impact on social relationships

Issue 5: What are some of the barriers that you have seen or think makes in people trying to take care of diabetes?

Issue 6: When you did you get information about diabetes?

Probe: Brochures, Posters ,Church Group, Friend, Relatives, Health facility

Issue 7: What is are the challenges facing the residents who take care of someone with diabetes?

Probe: money, transportation, time, appointment availability, plans to exercise, knowing food choices, diet, or family issues.

We have come to the end of this discussion. Thank you very much for taking your time to discuss these issues with me.

Appendix X: Key Informant Guide

- 1) What would you say about the state of health in this community?
- 2) What are major health issues you see in your community, especially among low income/underserved people?
Where do people go for health care and what is their experience like?
What are some of your experiences accessing health care in this community?
- 3) What are some of the consequences of ill health in your community?
- 4) What happens to uninsured people needing hospital care?
What would you say about the diabetes as a condition in this community?
- 5) In your opinion, what are the consequences of diabetes in your community?
- 6) In your opinion, what is diabetes?
- 7) What are the causes of this condition?
- 8) What are the awareness levels of the community on this condition?
- 9) What are the barriers the community is facing to increase their diabetes awareness and improve on clinical outcomes?
- 10) In what community forums that diabetes has been highlighted?
- 11) Are there initiatives in the community to increase knowledge on this condition?
- 12) In your opinion, how can diabetes awareness be created/ made in this community?
- 13) Are there social support groups in your community
- 14) What are some of the issues addressed in these groups?
- 15) Are health topics such as diabetes discussed or addressed in these groups?
- 16) Do you have a group that specifically addresses diabetes?
- 17) In your opinion, what do you think could encourage and support more community involvement/advocacy around diabetes?

We have come to the end of this discussion. Thank you very much for taking your time to discuss these issues with me.