KNOWLEDGE AND ATTITUDE TOWARDS DIABETES AND FACTORS THAT INFLUENCE KNOWLEDGE OF DIABETES RISK FACTORS: A CASE OF ADULTS OF SINZA 'A' DAR-ES-SALAM, TANZANIA.

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Master of Public Health Dissertation
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By

Beatrice Paul Mushi, MD

A Dissertation Submitted in Partial Fulfillment of the requirement of the degree of Master of Public Health of Muhimbili University of Health and Allied Sciences

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CERTIFICATION

The undersigned certifies that he has read and hereby recommends for acceptance by Muhimbili University of Health and Allied Sciences a declaration entitled K***nowledge and Attitude towards Diabetes and Factors that Influence Knowledge of Diabetes Risk Factors: A Case of Adults of Sinza 'A, Dar-es-salam, Tanzania,*** in partial fulfillment of the requirement for the degree of Master of Public Health of Muhimbili University of Health and Allied Sciences.

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Dr. S. Kamazima

(Supervisor)

_____

Date

DECLARATION AND COPYRIGHT

I, **Beatrice Paul Mushi**, declare that this **dissertation** is my own original work and that it has not been submitted to any University for similar degree or any other degree award.

Signature……. **Date**…….

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Lastly but by no means the least heartfelt endless gratitude goes to my husband Dr. James Paul for his assistance in the supervision of research assistants and for his support and belief in me, in this academic adventure. His love and care made this difficult journey bearable

DEDICATION

This work is dedicated to my late mother Severa Tarimo Mushi who suffered the full extent of this disease; diabetes. Despite her battle with this disease she worked hard to ensure that all her children had a sound education.

ABSTRACT

Background: Diabetes mellitus (DM) is currently found in almost every population and epidemiological evidence suggest that without effective prevention and control programs the prevalence will continue to rise globally. Ninety percent of individuals with diabetes in the world have type 2 diabetes, luckily it is preventable in nine out of ten individuals. Understanding the level of knowledge, attitude and awareness towards diabetes in a population is the first step towards formulating a strategic preventive program for diabetes. Individual's knowledge on diabetes risk factors is paramount in the fight against progressive rapid rise of diabetes.

Objective: To determine level of knowledge and attitude towards diabetes and factors that influence knowledge of diabetes risk factors among study participants in Sinza A Dar-es-salaam Tanzania.

Methods: The study was conducted in June 2014. A cross sectional study design was used. A multistage random sampling process was employed to the ultimate sample unit (households) and one eligible member was interviewed from each household. A structured questionnaire with close-ended questions was used to gather information and an informed consent was sought prior to the interview. The statistical package for social science was used to analyze data.

Results: A total of 255 study participants were interviewed of whom 152(59.9%) were males. Respondents' ages ranged from 18 – 75 (mean = 37.3 ± 13.3years). Findings revealed an overall poor level of knowledge of diabetes among the study participants 164 (64.7%). Respondents had predominantly negative attitude towards diabetes 137(53.7). In multivariate analysis, respondents with diabetic family members had about 2 times the likelihood of having knowledge of diabetes risk factors compared to those without a diabetic family member [(AOR = 2.09, 95% CI =1.137 – 3.853); P = 0.018]. In addition, respondents who had an overall general knowledge of diabetes were about 13 times more likely to have a good

knowledge of diabetes risk factors compared to those who had poor knowledge of diabetes [(AOR = 13.37, 95% CI = 5.355 – 33.405); P < 0.001].

Conclusion and recommendation:

This study has shown that the community of Sinza 'A' has a significant low level of knowledge of diabetes. It was also observed that unemployment, sex (male) and a very young age was associated with a negative attitude towards diabetes. Good knowledge of risk factors was greatly associated with one having a good general knowledge of diabetes. The majority of individuals who were aware and knowledgeable of the disease were mostly so because of the presence of a family member with the disease among the respondents.

There is a need for further in-depth studies to investigate the social and cultural perceptions of health in Tanzania in regards to diabetes. Therefore shedding light on why attitude is predominantly negative. It is recommended that further studies be done to evaluate diabetes knowledge in other districts among the rural and urban population so that comparative inferences can be drawn and intervention strategies formulated. Diabetes prevention greatly depends on recognition of its risk factors, so its prevention interventions needs to target health education directed to the community both affected and the general population.

Key words: Diabetes, prevention, identifying most at risk, intervention, lifestyle

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LIST OF ABBREVIATIONS

DAS	District Administrative Secretary
DCMG	Diabetes Clinical Management Guideline
DM	Diabetes Mellitus
FBG	Fasting Blood Glucose
FGD	Focus Group Discussion
HBM	Health Belief Model
HIV	Human Immunodeficiency Virus
IDF	International Diabetes Federation
IFGL	Impaired Fasting Glucose Level
IGT	Impaired Glucose Tolerance
MDG	Millennium Development Goals
MOHSW	Ministry Of Health and Social Welfare
MUHAS	Muhimbili University of Health and Allied Sciences
OGTT	Oral Glucose Tolerance Test
PI	Principal Investigator
RBG	Random Blood Glucose
RAS	Regional Administrative Secretary
T2DM	Type 2 Diabetes Mellitu
TDA	Tanzania Diabetes Association

TPB	Theory of Planned Behavior
TRA	Theory of Reasoned Action
USA	United States of America
WHO	World Health Organization

OPERATIONAL DEFINITIONS

Attitude: Refers to general and enduring positive or negative feelings about an object, person or an issue developed after exposure to information targeted towards the object, person or issue.

Intervention: Any measure taken whose purpose is to improve health or alter the course of a disease.

Knowledge: Is a familiarity, awareness or understanding of someone or something, such as facts, information, descriptions, or skills, which is acquired through experience or education by perceiving, discovering, or learning.

Lifestyle: The habits, attitudes, tastes, moral standards, economic level, etc., that together constitute the mode of living of an individual or group.

Prevention: Literally means to keep something from happening

Risk: The probability that an event will occur.

Risk factor: An exposure that is statistically related in some way to the outcome.

2-Hour Plasma Glucose:

2 hour post load glucose test (after drinking a beverage containing 75 grams of glucose dissolved in water) plasma glucose, also known as Oral Glucose Tolerance Test (OGTT). Any one positive test should be confirmed with another test subsequently.

CHAPTER ONE

1.0 INTRODUCTION

1.1 BACKGROUND

Diabetes mellitus (DM) is currently found in almost every population and epidemiological evidence suggest that without effective prevention and control programs the prevalence will continue to rise globally (Diabetes Atlas. 2014). Ninety percent of individuals with diabetes in the world have type 2 diabetes mellitus (T2DM) (WHO, 2012), luckily it is preventable in nine out of ten individuals. Diabetes is a complex disorder in which common variants interact with environmental factors to unmask the disease. The identification of persons at high risk for the disease may aid in disease prevention. A family history of diabetes, an increase in body-mass index (BMI), which is the weight in kilograms divided by the square of the height in meters, inactivity, impaired insulin secretion and its action are risk factors for diabetes. (LyAssenko et al., 2008).

Globally, DM is becoming a major public health problem posing significant socio-economic challenges (Mbaya et al., 2010). Currently 347 million people have diabetes and it is estimated that 3.4 million people died in 2010 from consequences of fasting high blood sugar. More than 80% of diabetes deaths occur in low- and middle-income countries and these countries will also see the greatest increase over the next 19 years (Simmons et al. 2010)**,** (World Health Organization, 2011, Beagley et al., 2013). In 2011 the International Diabetes Federation (IDF) estimated that diabetes was expected to rise to 552 million by 2030 (Bergman, 2013).

The Africa Region, where diabetes was once rare, has witnessed a surge in the condition. Type 2 diabetes prevalence among 20–79-year-olds is 4.9% with the majority of people with diabetes less than 60 years old (Peer et al., 2013). In Africa, mortality attributable to diabetes in 2013 was estimated to be over half a million. In Tanzania, DM appears to be fuelled by rapid social-economic changes, aging population, dietary changes, and decrease in physical activities. DM has increased from 0.8% in the 1980s to 9.1% in 2012, (TDA and MOHSW,

2012). As a result, 46% of patients and families with patients with DM have debilitating financial difficulties.

With adult and child obesity rates on the rise, preventing obesity in individuals especially childhood obesity is of increasing urgency in curbing the largest epidemic of our times (McCall & Raj, 2009). Knowledge of diabetes, the right attitude and lifestyle as well as behavioral intervention, can result in a reduction of around 50% in diabetes incidence that persist even after the individual lifestyle counseling has stopped (Sanz et al. 2010). It is widely accepted that many problems, previously thought of as primary medical and, hence, demanding conventional medical intervention, are in fact more appropriately disentangled by changing individual and social attitudes and behaviors. Various recent studies conducted in many parts of the world suggest that there is a lack of public awareness and knowledge of various factors related to diabetes.

There is a clear consensus that action is needed to develop targeted community-based prevention programs and strategies for DM especially T2DM which incorporate education on diabetes (Schwarz et al., 2007). Aggressive, timely, and physiologic management of pre-diabetes should be advocated (Unger, 2008). This can only succeed if and only if individuals are knowledgeable about the risk factors, form positive attitudes towards those risk factors and have programs that target overall behavior change.

1.2 WHAT IS DIABETES?

Although it is believed that DM is the result of a complex interplay between genetic and environmental factors, compelling evidence from epidemiological studies indicate that the current diabetes epidemic is largely due to changes in diet and lifestyle (Schulze & Hu, 2005). Bodies of individuals with DM either do not produce insulin (type 1) or do make a small amount of insulin, and at other times, the body cannot use the insulin produced (insulin resistant, T2DM). As a result, glucose is not able to get into cells and instead builds up in blood (hyperglycemia). Anyone can get DM, but those at highest risk for the disease are;

family members with history of diabetes, age over 40, obesity, history of gestational diabetes, inactivity, and high triglycerides (Webmed, 2012). Depending on what factor is predominant, there exist four types of diabetes, type 1, type 2, gestational diabetes and others (example as a result of infection, accident with damage to the pancreas).

1.2.1 SYMPTOMS OF DIABETES

The symptoms of diabetes may develop suddenly in type 1 diabetes or gradually as in T2DM characterized by a long pre-clinical phase and many individuals acquiring it may remain asymptomatic. Some individuals present with symptoms of its complications, and others die without knowing that they had diabetes. Symptoms may include fatigue, frequent urination (polyuria), increased thirst (polidipsia), hunger (poliphagia), weight loss, blurred vision, and slow healing of wounds.

1.2.2 TESTING FOR DIABETES

Diagnosis of DM can be made based on any of the following test results (Diabetes & Clearinghouse 2005) as shown in table below;

Diabetes tests and testing results.

NORMOGLYCEMIA	IFG OR IGT	DIABETES
Fasting Plasma Glucose < 110mg/dl (6.1 mmol/l)	Fasting Plasma Glucose (IGT) ≥ 110 (6.1) AND < 126mg/dl (7 mmol/l)	Fasting Plasma Glucose ≥ 126 mg/dl (7mmol/l)
2-h Plasma Glucose < 140mg/dl (8 mmol/l)	2-h Plasma Glucose ≥ 140 (8mmol/dl) and < 200 mg/dl (11.1 mmol/l)	2-h Plasma Glucose ≥ 200mg/dl (11.1 mmol/l)
	Random plasma glucose concentration ≥ 200mg/dl (11.1mmol/l).	Symptoms of diabetes and random Plasma glucose concentration ≥ 200mg/dl.

IFG - Impaired Fasting Glucose

IGT – Impaired Glucose Tolerance

1.2.3 PREVENTING DIABETES

People with pre-diabetes (individuals at risk of developing diabetes) and FBG ≥ 6.1 and < 7.0gm/dl have blood glucose levels that are higher than normal but not high enough for a diagnosis of diabetes (≥ 7.0 mmol/l). This condition raises the risk of one developing diabetes, heart disease and stroke. Population-based studies in China, Finland and USA have recently demonstrated the feasibility of preventing, or delaying the onset of diabetes in overweight subjects. The studies suggest that even with moderate reduction in weight and

only half an hour of walking each day reduced the incidence of diabetes by more than one half (WHO fact sheet, 2014)

Prevention of diabetes involves early diagnosis, and this can be approached in two main ways (WHO, 2006);

1. **The high risk approach**; seeks to identify individuals at high risk of diabetes and work with them to reduce or eliminate those risks thus decreasing or delaying the chances of developing DM.
2. **The population approach**; seeks to protect and promote health and reduce the development of lifestyle diseases like DM, by creating an environment where healthy lifestyle options are obtainable. This can be achieved by having a formulation of a clear Ministry of Health and Social Welfare (MOHSW) policy and food legislation. Involvement of industries, individuals, communities and workplaces in creating and sustaining environment which undermines diabetes environmental factors Structured interventions combining physical activity and modest weight loss have been shown to lower type 2 diabetes risk by up to 58% in high-risk populations (Colberg et al. 2010).

1.2.4 MANAGEMENT OF DIABETES

Although insulin is not considered a cure, its discovery was the first major breakthrough in diabetes management for type 1 diabetes. It has also been beneficial for the management of T2DM, including oral medication. Healthy eating, physical activity, oral medication and taking insulin are the basic therapies for T2DM. The amount of insulin must be balanced with food intake and daily activities. Blood glucose levels must be closely monitored through frequent blood glucose checking. Individuals with diabetes can also monitor blood glucose levels several times a year with a laboratory test called the A1C. Results of the A1C test reflect average blood glucose over a 2- to 3-month (Diabetes & Clearinghouse 2005)

1.2.5 COMPLICATIONS

Diabetes complications are serious and life threatening leading to morbidity and untimely mortality. These include heart disease, stroke, high blood pressure, blindness, kidney disease, dental disease, nervous system disease, infections, slow healing of wounds, importance and pregnancy associated complications.

1.2.6 COST IMPLICATIONS OF DIABETES

The cost implications resulting from the increase in the prevalence of DM are enormous. The United States spends approximately $132 billion on diabetes-related problems per year, and diabetes alone represents 11% of the U.S.A's health care expenditure. Diabetes can lead to a wide range of serious health complications as shown above. Each year more than 80,000 individuals with diabetes undergo amputation in USA. The indirect costs of diabetes include nearly 88 million days (WHO, 2011) of disability leave from work and 176,000 cases of permanent disability were caused by diabetes, at a cost of $7.5 billion. The indirect costs of diabetes are estimated to be $40 billion (World Health Organization 2011a). Premature mortality caused by diabetes results in an estimated 12-14 years of life lost. Healthy lifestyle interventions for the general population and intensive lifestyle and medication interventions for high-risk individuals present opportunities for diabetes prevention (Herman, 2011).

In Tanzania, the economic burden of diabetes is significant. In a study conducted in Kilimanjaro Region, the total direct costs related to the management of diabetes accounted for a quarter of the minimum wage, resulting in approximately 46% of the patients having permanent financial difficulties. Another study from Dr-es-salaam reported that 8% of the total government health expenditure was spent on 2.5% of the Tanzanian population who had diabetes.

1.2.7 BEHAVIOR CHANGE THEORY

A number of models have attempted to look into what causes individuals to behave the way they do when confronted with a health related problem (MacKian, 2002). Individual's behaviors can be explained using different behavior theories.

- **The theory of health belief model (HBM)**

In order for behavior change to take place, an individual must first believe that change is both possible and beneficial, and that the benefits of changing outweigh any perceived costs of making the change. The model demonstrates the relationship between an individual's attitudes towards a particular set of behaviors, and their subsequent willingness or ability to make changes to improve or protect their health.

The theory was developed in 1950s and later modified, it is a widely applied model in several disciplines in public health (Sheeran & Abraham, 1995) to explain widespread failure of people to participate in programs that were set to prevent and detect diseases. The theory has five components; Perceived susceptibility, Perceived severity, Perceived benefits, Perceived barriers, and Cues to action. Based on this theory, with information and education individuals will be informed on the burden of the disease related to the complications that result from it (morbidity, mortality and dissability), acting as a cue to action for individuals to take measure in preventing developing diabetes.

- **The social cognitive theory**

Also considers the importance of an individual's knowledge and attitudes in influencing behavior and behavior change. It also recognizes the impact of external factors such as social and environmental influences on individual behavior.

1.3 STATEMENT OF THE PROBLEM

The International Diabetes Federation (IDF) under the umbrella of World Health Organization (WHO) developed a Diabetes Clinical Management Guideline (DCMG) for the management of diabetes, emphasizing on both prevention and clinical management care for diabetes. In 2006, the IDF guideline was then adopted for the development of the Sub Saharan African DCMG. Tanzania later adopted the Sub Sahara Africa DCMG, embracing both clinical management care and prevention parts of the guideline. In the formulation of the Tanzanian DCMG, prevention was based on identifying those at risk and thereafter, intervening. Knowledge about people's awareness, level of knowledge and attitude in a population is the first step towards formulating a prevention program for diabetes.

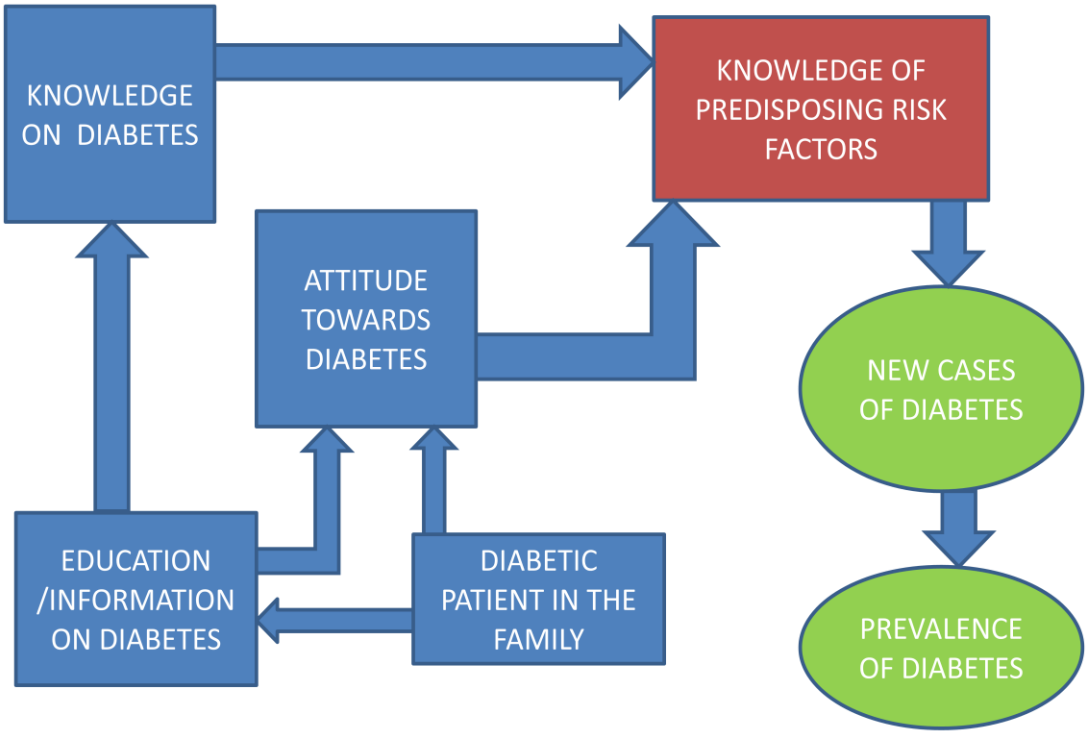
Despite the existence of the DCMG, the prevalence of diabetes is on the rise. Reasons have to be sought. Knowledge about the level of awareness and knowledge of diabetes in a population is the first step in formulating a prevention program for diabetes. Cultivating a positive attitude towards diabetes can be used as a platform for disseminating information pertaining to diabetes. Early identification of those at risk is of paramount in the quest of succeeding in reducing the magnitude of diabetes, and this is only possible if individuals are knowledgeable about the different risks of diabetes. Therefore by intervening, prevention or delay of progression to diabetes will be realized. Effective intervention requires understanding of community or population level of knowledge, attitude as well as knowledge of diabetes risk factors.

1.3.1 RATIONALE

The study seeks to understand the factors behind the rise of diabetes despite the existence DCMG, by looking into knowledge of diabetes, attitudes and individuals' knowledge of DM risk factors. In so doing, light will be shed on individuals' knowledge, attitudes and knowledge of DM risks factors, which I believe, to be the fundamental element towards the goal of reducing the emergence of new diabetes cases. The assumption being, with good knowledge of diabetes and a positive attitude, individuals will be able to take care of their health, thus a steady reduction on the prevalence of diabetes.

1.3.2 CONCEPTUAL FRAME WORK

Figure 1: Conceptual frame work



The outcome (knowledge of predisposing risk factors) can be influenced positively or negative depending on the factors that influence knowledge of risk factors, subsequently leading to a reduction or increase of prevalence of diabetes in the society.

1.4 RESEARCH QUESTIONS

- What is the level of knowledge of diabetes among study participants?
- What is the attitude towards diabetes among study participants?
- What are the factors that influence knowledge of diabetes risk factors among study participants?

1.4.1 OBJECTIVES

1.4.2 BROAD OBJECTIVES

To assess knowledge and attitude towards diabetes and factors that influence knowledge of diabetes risk factors among study participants of Sinza 'A' Dar-es-salam, Tanzania.

1.4.3 SPECIFIC OBJECTIVES

1. To determine level of knowledge of diabetes among study participants of Sinza 'A' Dar-es-saalm, Tanzania.
2. To assess **attitude towards diabetes** among the study participants of Sinza 'A' Dar-es-saalm, Tanzania.
3. To determine factors that influence knowledge of diabetes risk factors among the study participants of Sinza 'A' Dar-es-saalm, Tanzania.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 OVERVIEW OF DIABETES

Demographic transition combined with urbanization and industrialization has resulted in drastic changes in lifestyles globally but the impact is felt more in developing countries because of their more rapid pace of growth. One of the consequences of this transition is a change in disease patterns with communicable disease being replaced by non-communicable or lifestyle related diseases; diabetes, obesity, cardiovascular disease and cancer. Until a decade ago, diabetes was not considered a major public health problem in developing countries like Tanzania, but the situation has now dramatically changed. A literature search on knowledge about diabetes in developing countries yielded very few studies actually dealing with awareness and or knowledge of diabetes among people with the disease or community at large.

A study conducted in USA with the purpose of assessing knowledge, perceptions, and risk factor awareness on T2DM and prevention practices among African American and Hispanic families with a history of diabetes. Ninth and the tenth grade Houston students with a family history of T2DM were recruited. Parents and students were interviewed. Open-ended questions in the interview guide assessed knowledge of diabetes and risk factors, attitude and knowledge of diabetes risk factors. Students reported on their dietary behavior and responses were recorded. 39 parents (95% female, 49% African-American and 51% Hispanic) and 21 ninth and tenth grade adolescents (71% female, 43% African-American, 57% 57% Hispanic) were interviewed. Majority were overweight, approximately 50% of both groups reported some knowledge of diabetes. 74% of parents correctly identified family history as a risk factor, but few adolescents responded correctly. Being overweight was identified as a risk factor by 26% of the parents and 10% of the adolescents. Losing weight was not acknowledged as a way to reduce diabetes risk. Overall, there was a lack of knowledge about risk and prevention of type 2 diabetes among African American and Hispanic families at risk.

From a public health perspective, there was a critical need for innovative prevention programs targeting families at risk for diabetes (Cullen & Buzek, 2009)

A study conducted in Oman had the objective of assessing general population knowledge and attitude of diabetes and to tease out whatever relationship that exists between the various components of knowledge and social demographic background in a semi-urban community in Oman. The study demonstrated that significant numbers of Omans lack the knowledge and the right attitude required to prevent and cope with the increasing prevalence of diabetes in Oman. On the bright side, the study strongly implicates level of education as the most significant predictor of desirable knowledge and perceptions of diabetes risk factors, complications and prevention. This raises optimism that health education could be a powerful tool as we strive to develop strategies to fight debilitating and rapidly growing public health problems in Oman, problems that often are amenable to life style changes and, by implication, education.(Simmons et al. 2010)

In a study conducted with the population of Puducherry, South India it was observed that the prevalence of undiagnosed DM was 10.3%. Moreover, adults with the increasing age, urban residence, illiterate, non-vegetarian dietary habit, tobacco addiction and hypercholesterolemia were more likely to develop DM (Bharati et al. 2011). These findings suggest that it is crucial to lay foundation for the introduction of prevention at primary health care level and community participation.

In another study conducted in India only 75.5% of the whole population reported having knowledge about a condition called diabetes. 77.6% of males knew about diabetes compared to 73.6% of females. 60.2% of participants felt that the prevalence of diabetes was increasing (Kapur & Mohan, 2005). Knowledge about the level of awareness about diabetes in a population is the first formulating a prevention program for diabetes.

A study on knowledge, attitude and practices of diabetic patients in the United Arab Emirates, found that 31% of the participants had good knowledge of diabetes, 72% had negative attitude towards the disease. In its conclusion the study showed low levels of diabetes awareness but positive attitudes towards the importance of DM care. The study also showed that a history of diabetes in the first degree relatives had a positive impact on disease knowledge (Al-Maskari et al. 2013).

Another study investigating the awareness level about DM and associated factors was conducted in Tarlai ((Ulvi et al. 2009). In a sample size of 300 only 43% of the participants had been aware of DM. The study had shown that the rural communities of Pakistan were unaware about the risks and complications of DM, also evidence shows that the knowledge and understanding of Indian and Pakistani groups about diabetes were poor. The majority of those who were aware had a relative with Diabetes. Similar results have been found in the Pakistani community in Nottingham and the Indian community in Coventry (Baradaran et al. 2006).

Even a study conducted in a developed country set up, it was found that knowledge about diabetes amongst ethnic groups in Glasgow was poor. An assessment of the level of diabetic patients' knowledge of DM, its complications and management in Durban, South Africa was also conducted. Many respondents thought that hereditary factor (78%), and dietary and lifestyle (77%), were important risk factors in the development of DM (Mashige et al. 2008)
An assessment of the level of diabetic patients' knowledge of DM, its complications and management in Durban, South Africa was also conducted. Many respondents thought that hereditary factor (78%), and dietary and lifestyle (77%), were important risk factors in the development of DM (Mashige et al. 2008)

In Kenya a study on Knowledge, Attitude, and Practice related to diabetes among community members in four provinces, was conducted. First of all, the study revealed a disparity in level of knowledge in different regions. Level of knowledge ranged from 24% to 31% amongst the

different regions. 70% of all respondents from each of the four regions had poor knowledge of diabetes (Kiberenge et al. 2010).

There is a dire need to provide knowledge to community members, giving an opportunity and benefits of individuals taking care of their health and thus leading to early diabetes diagnosis and ability to identify those that are at risk of developing T2DM. Strategic plans for identification of individuals at risk can be implemented to effectively address the future burden of this chronic disease. There is an urgent need to implement disease prevention strategies; information and education. A reliable baseline status on the current knowledge and attitude on the subject of early identification of individuals at risk of developing T2DM is mandatory, aiming at delaying or eliminating emergence of new cases of T2DM.

CHAPTER THREE

3.0 METHODOLOGY

3.1 STUDY DESIGN

A cross sectional study was conducted in the month of June 2014, where information was captured in a single face to face interview of the identified participants, saving time and cost.

3.2 STUDY AREA

The study was conducted in June 2014 in Sinza 'A', Kinondoni district, Dar-es-salaam Tanzania. Dar-es-salaam is Tanzanian's largest city and regionally an important economic centre. The city has a population of 4,364,541 as of the 2012 census. Dar-es-salaam is at 6°48' south, 39°17' east on a natural harbor of the eastern cost of Africa. The area has relatively households with middle incomes, rendering them able to afford westernized type of lifestyle. A lot of fast food restaurants and take away food shops which contribute to unhealthy eating habits are readily available. In the city, majority of individuals who can afford own private means of transportation resulting in them leading sedentary lifestyles. Administratively Kinondoni district has four divisions, thirty four wards and is the most populated amongst the three districts, with half of the city's population residing within it. Original inhabitants were the Zaramo and Ndengereko, but due to urbanization, the district has become multi-ethnic.

Sinza 'A', is one of the wards in Kinondoni with five "Mitaa" (administrative streets), Sinza A, B, C, D and F. Sinza has a population of 36,500 according to the 2012 census. It is headed by the "Mtaa" (administrative street) Executive Officer, and constitutes of 1012 households of diverse economic status but majority being of middle economic class.

3.3 STUDY POPULATION

The study targeted head of households with ages eighteen years and above currently residing in Sinza A, Kinondoni, Dar-es-salaam Tanzania.

3.4 SAMPLE SIZE

Sample size was determined based on the following formula of estimating single proportions

$$n = \frac{z^2 p (100-p)}{d^2}$$

Where n = the required minimum sample size

z = Standard normal deviate corresponding to 95% confidence level (= 1.96).

p = estimated expected proportion of adults with good knowledge

ε = margin of error on p (set at 6%)

$$n = \frac{1.96^2 \, 30(100-30)}{6^2}$$

$$n = 225$$

Applying the formula using expected level of knowledge at 30% (Puepet and colleagues)

The above formula yields a minimum required sample size of 225 households (one individual per household = 225 individuals)

By adding 10% which is 23 in case of non response, in the end a total of 255 individuals were interviewed.

3.5 SAMPLING TECHNIQUE

Multistage random cluster sampling technique was employed to the ultimate sample unit (households) and eventually one individual per household (Head of household) was interviewed.

First stage was selection of a District.

At the regional level a list of all districts was obtained. A selection of the district was done by using simple random technique whereby from the sample frame, districts were assigned numbers. Following a simple random technique using the lottery method a single district was picked and identified to be Kinondoni district.

Second stage was selection of a Ward.

Kinondoni district has 34 Wards in total, and a list of names of all wards was obtained. Same method as above was used to pick one Ward in the district, Sinza ward was identified.

Third stage was selection of a "Mtaa" (administrative street),

From a total of 5 "Mitaa" of Sinza the same method as in first stage, was used and Sinza A was picked.

Fourth stage was selection of households

A sample frame with a list of all house numbers in Sinza "A" was obtained (1012 households). From the 1012 households (HH) in Sinza 'A' a systematic sampling technique using the interval method was used to identify the 255 HHs. Each HH on the list had a number, and the list was listed in an ascending chronological order. The first HH number was identified by conducting a simple random sampling on the first three HH numbers using the lottery method. The HH number identified was used as a starting point for the selection of subsequent HH numbers by the interval method. Where K (interval) was calculated using the formula K = N/n (N total number of HH and n = number of sample HHs).

Following the calculation K = 3.9, The principal investigator (PI) made a decision of using 3 as the interval (this way all 255 HH will come from within the 1012 HH), so from the first HH number picked the next HH to be picked was at an interval of 3, and the 4th HH was subsequently picked till a total of 255 HHs were obtained.

Exclusion criteria

Individuals that refused to consent to participate in the study.

3.6 DATA COLLECTION TOOL

The primary data were collected using a structured questionnaire with closed ended questions. Questions were written in English; afterwards translated to Swahili so as to ensure that questions were clearly and easily understood by all participants. After the interview the responses were later recorded in the English version of the questionnaire. The questionnaire had four sections:

1. Demographic characteristic questions
2. Knowledge of diabetes including risk factors
3. Attitude on diabetes
4. Diabetes risk perception and individuals responsibility

Knowledge measurement consisted of 19 questions (C 11 – C13 and C17 – C122) with a total of 39 points. A question answered correctly scored 1 point and an incorrect answer scored 0 point. The score ranged from 0 - 39 points and using cut off points to obtain either three levels of knowledge as shown below.

POINTS	LEVEL OF KNOWLEDGE AND SCORES
0 – 19	LOW
20 – 29	MODERATE
30 – 39	HIGH

Or two levels of knowledge (0 – 22 point = Poor, 23 – 39 points = Good). The choice of which to use was at the discretion of the PI depending on the comparative studies to be used for comparison in the discussion. In this case because from literature review most of the studies had used the good and poor category, the PI decided to analyze results on knowledge using the good and poor category.

Attitude was measured using 12 statements (C21 – C112) and scores recorded based on the likert scale with a total of 48 points. In each statement the maximum points was set at 4 and the lowest point at 1 (based on the points assigned for strongly agree, agree, disagree and strongly disagree for both positive and negative statements). Cut off points was set at 29 points, therefore 0 - 29 negative attitude and 30 – 48 for positive attitude. Attitude section had both positive and negative statements with their respective scores as shown below

POSITIVE		**NEGATIVE**	
OPTIONS	SCORE		SCORE
Strongly agree	4	Strongly agree	1
Agree	3	Agree	2
Disagree	2	Disagree	3
Strong disagree	1	Strong disagree	4

Knowledge of risk factors was measured using 6 points; respondents who identified 0 to 3 points were categorized as having poor knowledge. Respondents who were able to identify 4 and more points were categorized as having good knowledge.

3.6.1 Variables

Dependant Variable

Knowledge of diabetes risk factors

Independent Variables

1. Social demographic characteristics (Age, Sex, marital status, level of education and occupation)
2. Level of knowledge of diabetes
3. Attitude towards diabetes
4. Family member with diabetes.

3.7 DATA COLLECTION

3.7.1 Permission to conduct study

Muhimbili University of Health and Allied Sciences provided the Principal Investigator (PI) with an official permission letter allowing the PI to conduct this study in the specified study area. Permission was also granted from 'Mtaa' (administrative street) Executive Administrative Officer of the Ward selected.

3.7.2 Recruitment of Research assistants

Principal Investigator (PI) required assistance of two assistants (RA) during field work to collecting data. Qualification criteria for RA included any form of medical background, preferably medical doctors, medical assistance, pharmacist and or nurses. Previous research experience in data collection, entry and good communication skills were considered.

3.7.3 Training

Two day eight hour sessions of training were conducted to shed light on the following:

- Objectives of the study
- Overview data collection process

- Obtaining consent
- Interview skills
- Using the instrument
- Understanding the questionnaire and concepts behind each question
- How responses were to be recorded
- And understanding the importance of confidentiality.

3.7.4 Data collection

Field work lasted for 12 days. The PI and the research assistance interviewed participants in each of the households (HH) selected. Each member of the team conducted 7 to 10 interviews per day. In each HH the interviewers requested to interview the head of the HH. In the event the head of the HH was unavailable, the available individual above 18 years was interviewed. In case there was more than one individual above 18 years at the time, a simple random sampling technique using the lottery method was employed to pick whom to interview. Simply pieces of paper were folded to much the number of individuals 18 and above years of age. One piece had a Yes and the rest No, the folded pieces were then shuffled; whoever picked up the piece of paper with a Yes on it was subsequently interviewed.

3.7.5 Quality control

The questionnaire was pre-tested and the necessary minor amendments were made making sure that questions were clear and responses matched the intended information that the PI was seeking. Pre-testing also helped in determining the study logistics and the time frame for each questionnaire. Each day it was the responsibility of the PI to supervise and go through each questionnaire to ensure that questionnaires were properly filled as a measure of quality

control. PI's availability for clarifications was also another measure of ensuring quality control. The risk of a research assistant recording wrong responses on account of not understanding the questions was eliminated.

3.8. DATA ANALYSIS

The statistical package for social sciences (SPSS) was used to analyze data and determine the association between the different independent variable and knowledge of diabetes risk factors. The results obtained were summarized in various tables or charts expressed as percentages and means with associated standard deviations. Analysis using cross tabulation was done and Chi-square test was used to test whether there were significant association between variables at significant level of 0.05.

3.9 ETHICAL CLEARANCE

Ethical clearance for the study was issued by the research and publication committee of Muhimbili University of Health and Allied Sciences (MUHAS) before the commencement of the study. An official permission letter was later issued to the PI. Before carrying out the study, permission was sort and granted from the regional Administrative Secretary (RAS) and District Administrative secretary (DAS). Permission was also granted from the Ward Administrative Secretary, 'Mtaa' (administrative street) Executive Administrative Officer, head of household and individuals. Participants were informed of the objective and purpose of the study, what was intended to be done and that no harm was to come to them. Participants were also informed of their right to decline or withdraw from the study at anytime in the course of the study. Despite of these rights the PI informed them that their participation was crucial and that their opinions will be greatly valued. It was clarified that questionnaires were to bear no names and all information collected was for research purposes only and therefore confidential. There after informed consent was sought and obtained from each participant before the interview.

CHAPTER FOUR

4.0 RESULTS

4.1 Demographic characteristics of the study population

Table 1, depicts the social demographic characteristics of the respondents in Sinza 'A', in which 152(59.9%) of the 255 respondents were males. Ages of the respondents ranged from 18 to 75 years (mean = 37 years ± 13.3years). It was observed that a third of the respondents 82(32.1%) were in the age group 20 – 29 years. 123(48.2%) of the respondents were married. The majority, 114 (44.7%) had completed secondary school education and 75(29.4%) had a tertiary level education. Regarding occupation, 127 (49.8%), were self employed and a substantial number of respondents had one or more family member with diabetes 110(43.1%). See table 1.

Table 1: Shows the demographic characteristics of the study participants n = 255

Characteristics	Number	%
Sex		
Male	152	59.6
Female	103	40.4
Age group		
≤ 19	6	2.4
20 – 29	82	32.1
30 – 39	76	29.8
40 – 49	40	15.7
50 - 59	27	10.6
60+	24	9.4
Marital status		
Never married	108	42.4
Married/cohabiting	123	48.2
Previously married†	24	9.4
Education level		
None formal education	1	4.0
Primary (incomplete/complete)	65	25.5
Secondary (incomplete/complete)	114	44.7
Tertiary	75	29.4
Occupation		
Civil servant	25	9.8
Privates	42	16.5
Self employed	127	49.8
Peasant	6	2.4
Unemployed	55	21.6
History of diabetes in Family		
Yes	110	43.1
No	145	56.9

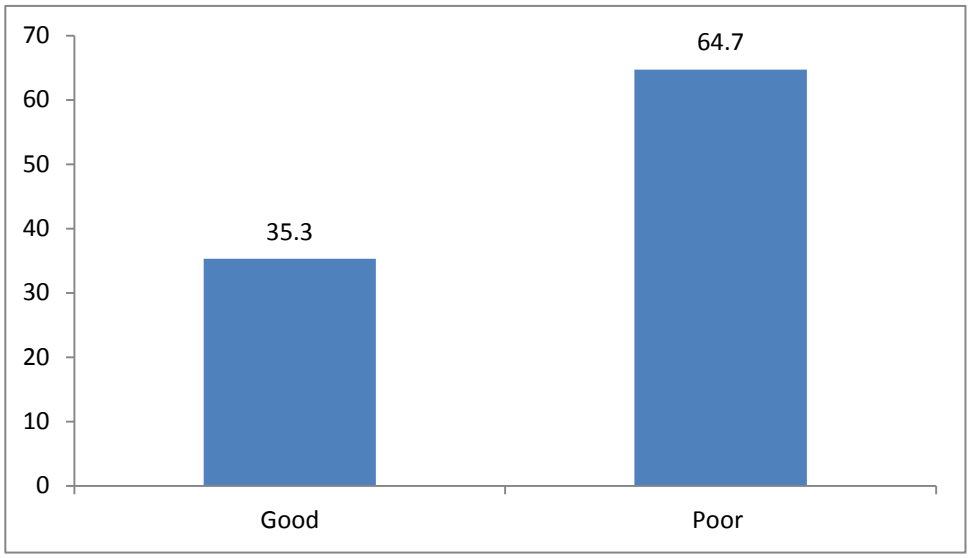
† Divorced/separated/widow/widower

4.2 Study Participants' level of knowledge

4.2.1 Overall level of knowledge

From figure 2, it was observed that overall, only 90(35.3%) had good knowledge of diabetes among study participants.

Figure 2: level of knowledge n = 255



4.2.2 Level of knowledge of diabetes by social demographic characteristics

Poor level of knowledge of diabetes was observed in both sexes, males at 96(63.2%) and females at 69(67.0%). There was no significant association between level of knowledge and sex. A statistical significant association between level of knowledge and the different age groups did exist (P = 0.007). Those in the age group 50 – 59, 17(62.9%) had good knowledge on diabetes, while the rest of the age groups had high proportion of respondents who had poor knowledge on the same. Significant association is observed between level of knowledge and occupation (P = 0.007). The self employed and the unemployed were observed to have poor level of knowledge of diabetes 90(70.9%) and und 39(70.9%) respectively. Respondents in the private category of occupation had good level of knowledge of diabetes 25(59.5%). Respondents with family members with diabetes had relatively better proportion of

respondents with good level of knowledge of diabetes 47(42.7%) compared to those without the existence of a diabetic individual in the family 43(29.7%). There was no statistical significant association between level of education and level of knowledge (P = 0.317). See table 2.

Table 2: Level of knowledge of diabetes by social demographic characteristics n = 255

Characteristic	knowledge Good	Poor	Total % n = 255	P-value
Sex				
Male	56 (36.8)	96 (63.2)	152 (59.6)	
Female	34 (33.0	69 (67.0)	103 (40.4)	0.530
Age group				
≤ 19	1 (16.7)	5 (83.3)	6(2.4)	
20 -29	22 (26.8)	60 (73.2)	82 (32.2)	
30 -39	22 (28.9)	54 (71.1)	76 (29.8)	
40 -49	17 (42.5)	23 (57.5)	40 (15.7)	0.007
50 -59	17 (62.9)	10 (37.0)	27 (10.6)	
60+	11 (45.8)	13 (54.2)	24 (9.4)	
Level of Education				
None formal education	0 (0.0)	1 (100)	1 (0.3)	
Primary education	20 (30.8)	45 (69.2)	65 (25.5)	
Secondary education	37 (32.5)	77 (67.5)	114 (44.7)	0.317*
Tertiary	33 (44.0)	42 (56.0)	75 (29.4)	
Occupation				
Civil servant	10 (40.0)	15(60.0)	25 (9.8)	
Private	25 (59.5)	17 (40.5)	42 (16.5)	
Self employment	37 (29.1)	90(70.9)	127 (49.8)	0.007
Peasant	2 (33.3)	4 (66.7)	6 (2.4)	
Unemployed	16 (29.1)	39 (70.9)	55 (21.6)	
Family member has diabetes				
Yes	47 (42.7)	63 (57.3)	110 (43.1)	0.035
No	43 (29.7)	102 (70.3)	145 (56.9)	

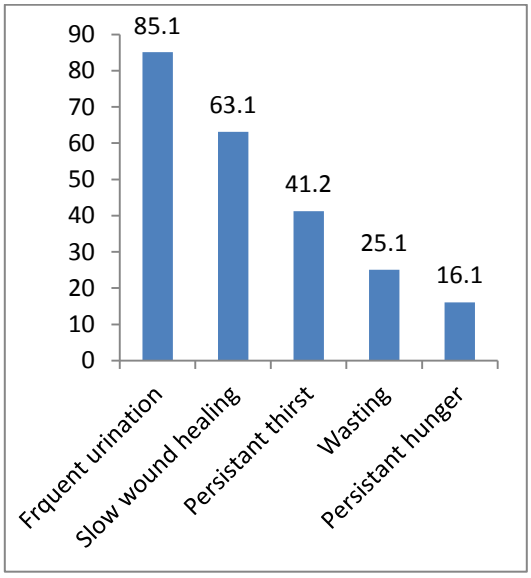
*Fisher exact test

4.2.3 Summarization of respondents' knowledge of symptoms and complications in percentages

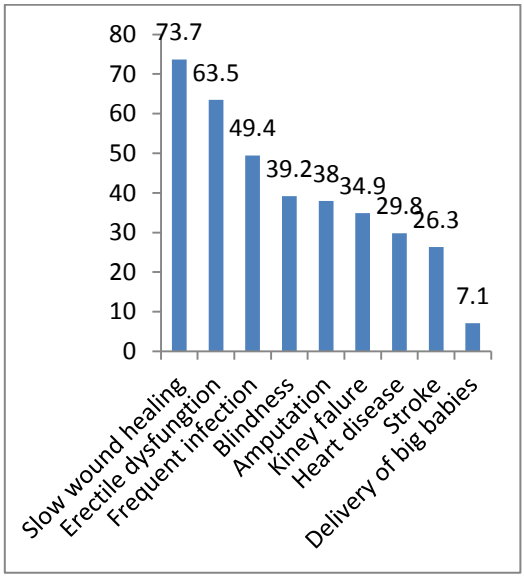
Majority of study participants had knowledge of frequent urination 217(85.1%) and slow healing of wounds 161(63.1%) as symptoms of diabetes. Percentages of other symptoms were below 50%. Respondents had a good knowledge of two of the complications, Slow healing of wounds 188(73.7%) and erectile dysfunction 162(63.5%). Recognition of the rest of complication was poor below 50%. See figure 3.

Figure 3: Summary of knowledge of diabetes symptoms and complications in percentages n = 255

Symptoms



Complications

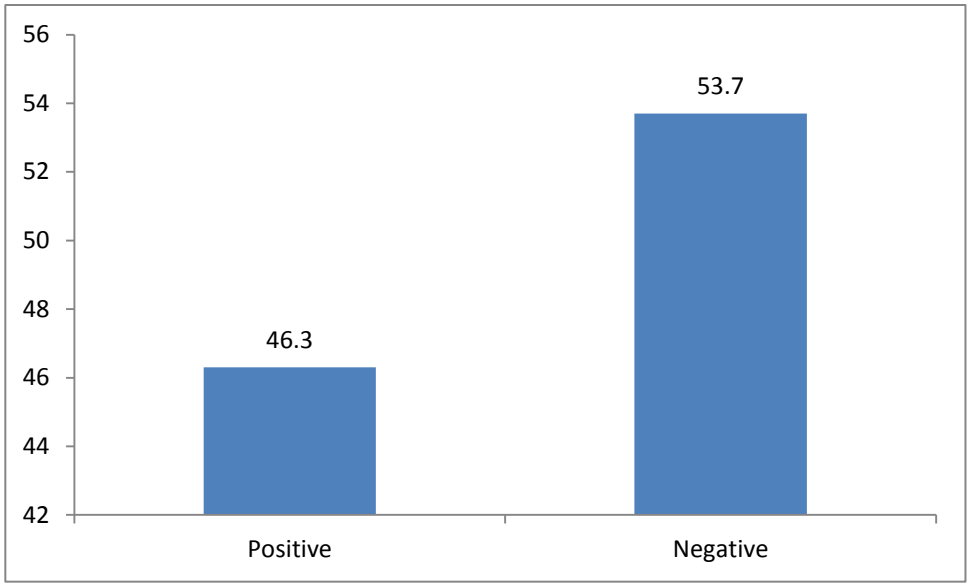


4.3 Attitude

4.3.1 Attitude of study participants towards diabetes.

Figure 4 shows proportions of both positive and negative attitudes of the study population. It was observed that 137(53.7%) of the respondents had a negative attitude towards diabetes.

Figure 4: Proportions of study participant's attitude towards diabetes n = 255



4.3.2 Attitude towards diabetes by social demographic characteristics

In table 3 it is observed that there is an association between occupation with attitude as well as having a family member with diabetes, (P = 0.009, and P = 0.043 respectively). Those in the private category of occupation showed a positive attitude, 30(71.4%) towards diabetes. Respondents with family members that have diabetes had a positive attitude 59(53.6%). Older respondents, age group 50 -59 years at 15(55.6%) and those above 60 years 13(54.2%) had a positive attitude towards diabetes. Those with tertiary education exhibited a positive attitude as well 42(56%). The rest of the categories had a negative attitude towards diabetes. See table 3;

Table 3: Attitude of respondents in relation to the social demographic characteristics n = 255

Variable	Positive n & %	Negative n & %	Total n & %	P value
Sex				
Male	6 7(44.1)	85 (55.9)	152 (59.6)	.393
Female	51 (49.5)	52 (50.5)	103 (40.4)	
Age group				
< 19	2 (33.3)	4 (66.7)	6 (2.4)	
20- 29	38 (46.3)	44 (53.7)	82 (34.5)	
30 -39	34 (44.7)	42 (55.3)	76 (29.8)	.754
40 - 49	16 (40.0)	24 (60.0)	40 (15.7)	
50 - 59	15 (55.6)	12 (44.4)	27 (10.6)	
60+	13 (54.2)	11 (43.8)	24 (9.4)	
Occupation				
Civil servant	12(48.0)	13 (52)	25 (9.8)	
Private	30 (71.4)	12 (28.6)	42 (16.5)	.009
Self employed	53 (41.7)	74 (58.3)	127 (49.8)	
Peasant	2 (33.3)	4(66.7)	6 (2.4)	
Unemployed	21 (38.1)	34 (61.8)	55 (21.6)	
Level of education				
None formal	0 (0.0)	1 (100)	1 (0.4)	
Primary education	26 (40)	39 (60)	65 (25.5)	
Secondary education	50 (43.9)	64 (56.1)	114 (44.7)	.171*
Tertiary	42 (56)	33 (44.0)	75 (29.4)	
Family member has diabetes				
Yes	59 (53.6)	51 (46.4)	110 (43.1)	0.043
No	59 (40.7)	86 (59.3)	145 (56.9)	

***Fisher exact test**

4.4 Participants' ability to identify diabetes risk factors

4.4.1 Knowledge of diabetes risk factors by level of knowledge of diabetes

The ability of the respondent to correctly identify diabetes risk factors was significantly associated with the overall level of knowledge of diabetes. Respondents who had been able to identify family history as a risk factor 47(52.2%) had good knowledge of diabetes while of those who had failed to identify it as risk factor 102(61.8%) had poor knowledge of diabetes. A high proportion of respondents who were able to identify obesity, poor diet, lack of exercise and age as risk factors had good knowledge, 81(90.0%), 87(96.7), 87(96.7%) and 80(88.9) respectively. Statistical significant levels were as follows, family history ($p = 0.035$), obesity ($p< 0.001$), poor diet ($p <0.001$), lack of exercise ($p < 0.001$), gestational diabetes ($p < 0.001$) and age groups ($p < 0.001$). See table 4.

Table 4: Diabetes risks factors by level of knowledge n = 255

Risk factors	Knowledge		P value
	Good	Poor	
Family history of DM			
Yes	47 (52.2)	63 (38.2)	.035
No	43 (47.8)	102 (61.8)	
Obesity			
Yes	81 (90.0)	85 (51.5)	.000
No	9 (10.0)	80 (48.5)	
Poor diet			
Yes	87(96.7)	109(66.1)	.000
No	3 (3.3)	56 (33.9)	
Lack of exercise			
Yes	87 (96.7)	116(70.3)	.000*
No	3 (3.3)	49 (27.9)	
Gestational diabetes			
Yes	45 (50.0)	43(26.1)	.000
No	45 (50.0)	122 (73.9)	
Age			
Yes	80 (88.9)	90(54.5)	.000
No	10 (11.1)	75 (45.5)	

*****Fisher exact test

Note: Total number of respondents with good knowledge = 90

Total number of respondents with poor knowledge = 165

4.4.2: **levels of knowledge of diabetes risk factors by factors that influence that knowledge.**

From table 5, both male and females had poor knowledge of diabetes risk factors, 108(71.1%) and 66(64.1%) respectively. Those in the age group of 50 – 59 had a good knowledge of diabetes risk factors 14(51.9%). Under education variable, the different levels of education sub groups were observed to have poor knowledge but the association was found not to be significant (P = 0.100). On occupation, respondents who work in the private sector 22(52.4%) had good knowledge of diabetes risk factors. This association was significant (P = 0.009). Respondents who had family members with diabetes had good knowledge 65(59.1%), and the association was statistically significant (p = 0.001). Those with an overall good knowledge of diabetes 54(60%), were found to have a good knowledge of diabetes risk factors. Of all the respondents with a positive attitude, 66(55.9%) had poor knowledge and the association was found to be statistically significant (P < 0.001). See table 5.

Table 5: Level of knowledge of risk factors by factors that influence knowledge of risk factors n = 255.

Factors	Knowledge (KN) of risk factors					P-value
	Good KN		Poor KN		Total	
	Number	Percentage	Number	Percentage	%	
Sex						
Male	44	28.9	108	71.1	59.6	.273
Female	37	35.9	66	64.1	40.4	
Age group						
≤ 19	0	0	6	100	2.4	
20 - 29	20	24.4	62	75.6	32.2	
30 – 39	23	30.3	53	69.7	29.8	.053
40 – 49	15	37.5	25	62.5	15.7	
50 – 59	14	51.9	13	48.1	10.6	
60 - 75	9	37.5	15	62.5	9.4	
Level of education						
None formal	0	0	1	100	0.3	
Primary	17	26.2	48	73.8	25.5	
Secondary	32	28.1	82	71.9	44.7	.100
Tertiary	32	42.6	43	57.3	29.4	
Occupation						
Civil servant	11	44.0	14	56.0	9.8	
Private	22	52.4	20	47.6	16.5	
Self employed	32	25.2	95	74.8	49.8	.009
Peasant	1	16.7	5	83.3	2.4	
Unemployed	15	27.3	40	72.7	21.6	
Family member has DM						
Yes	65	59.1	45	40.9	43.1	.006
No	36	24.8	109	75.2	56.9	
General KN						
Good	54	60.0	36	55.9	35.3	
Poor	27	16.4	138	83.6	64.7	.000
Attitude						
Positive	52	44.1	66	55.9	46.3	
Negative	29	21.2	108	78.8	53.7	.000

Good knowledge – able to identify at least four risk factors

Poor knowledge – able to identify up to three risk factors

4.4.3 Univariate and multivariate Logistic regression analysis for factors associated with knowledge of diabetes risk factors.

Following the Bivariate and univariate analysis, all variables with a statistical significant level of ≤ 0.2 were included in the multivariate analysis.

Table 6 summarizes the univariate and multivariate logistic regression analysis of factors associated with knowledge of diabetes risk factor among study participants. In univariate analysis, respondents with diabetic family members, private occupation, good general knowledge of diabetes and a positive attitude were found to be statistical significant predictors of knowledge of diabetes risk factors, P = 0.006, P =0.013, P < 0001 and P < 0.001 respectfully. In multivariate analysis, respondents with diabetic family members had 2 times likelihood of having knowledge of diabetes risk factors compared to those without diabetic family member [(AOR = 2.09, 95% CI =1.137 – 3.853); P = 0.018]. In addition, respondents who had an overall general knowledge of diabetes were 13 times more likely to have a good knowledge of diabetes risk factors compared to those who did had not receive any knowledge of diabetes [(AOR = 13.37, 95% CI = 5.355 – 33.405); P < 0.001]. See table 6.

Table 6: Univariate and Multivariate logistic regression analysis for factors that influence knowledge of risk factors among study participants n = 255

Variable	Univariate Regression Crude OR (95% CI)	P-value	Multivariate Regression Adjusted OR (95% CI)	P-value
Family member with DM				
No	1.0		1.0	
Yes	2.1(1.227 – 3.580)	0.006	2.09(1.137 – 3.853)	0.018
Age groups				
≤ 19	0.00(0.000)	0.999	1.30(0.138 – 12.335)	0.818
20 – 29	0.54(0.204 – 1.415)	0.209	1.75(0.543 – 5.627)	0.349
30 – 39	0.72(0.277 – 1.890)	0.509	2.88(0.851 – 9.715)	0.089
40 – 49	1.0(0.352 – 2.844)	1.000	2.51(0.663 – 9.468)	0.176
50 – 59	1.79(0.586 – 5.497)	0.306	1.15(0.266 – 4.959)	0.853
60 – 75	1.0			
Level of education				
None formal	0.00(0.000)	1.000	19.6(0.000)	1.000
Primary	0.48(0.232 – 0.976)	0.043	0.66(0.281 - 1.548)	0.339
Secondary	0.52(0.289 – 0.968)	0.039	0.54(0.255 – 1.138)	0.105
Tertiary	1.0			
Occupation				
Civil servant	2.1(.780 – 5.626)	0.142	0.75(0.228 – 2.468)	0.636
Private	2.9(1.256 – 6.848)	0.013	0.95(0.329 – 2.749)	0.927
Self employed	0.90(0.439– 1.838)	0.769	0.83(0.368 – 1.874)	0.654
Peasant	0.53(0.057– 4.948)	0.580	0.40(0.045 – 3.538)	0.408
Unemployed	1.0		1.0	
Overall knowledge of DM				
Poor	1.0		1.0	
Good	7.67(4.25 – 13.829)	0.000	13.4(5.355 – 33.405)	0.000
Attitude				
Negative	1.0		1.0	
Positive	2.93(1.697 - 5.075)	0.000	0.97(0.476 – 1.988)	0.940

CHAPTER FIVE

5.0 DISCUSSION

5.1 Summary of findings

The aim of this study was to determine the level of knowledge and attitude of the study participants as well as the factors that influence knowledge of diabetes risk factors. Most studies on knowledge and attitude on diabetes carried out in Africa and elsewhere target patients with diabetes. In contrast, this study targeted the general population. Both sexes exhibited almost the same proportion of low level of knowledge. This was observed to be significantly low in the younger age groups and those who were unemployed, self employed and peasants.

Negative attitude was noted to be among the unemployed, those with a primary education or lower. Peasants and respondents in the younger and middle age groups also had a negative attitude. It was determined that respondents with good knowledge of diabetes did not necessarily have good knowledge of diabetes risk factors. Two factors were significantly found to be predictors of knowledge of diabetes risk factors; having a diabetic family member and a good overall knowledge of diabetes.

5.2 Main findings

5.2.1 Level of knowledge of study participants

The current study looked at five demographic variables, sex, age, marital status, level of education, and occupation. Study participants comprised of respondents aged 18 to 75years, with males at (59.9%) from Sinza ‘A’. Dar-es-salaam, Tanzania. Majority of the respondents were self employed, and a high proportion had a secondary school level of education.

This study revealed that, among the study participants the majority of them had poor knowledge of diabetes, only a little above a third of the respondents had a good knowledge with similar proportions between the sexes. Deficiency in knowledge of diabetes among community members in Kenya was found to be similarly low. The study done in Kenya,

showed that majority had a poor knowledge of diabetes (Kiberenge., et al. 2010). Puepet and colleagues found a similar low level of knowledge of diabetes, surprisingly amongst patients with diabetes in Jos State, Nigeria. Another study done in Malaysia also revealed low levels of knowledge in the general population. In contrast, a study done in South Africa (Mashige., et al), reported that most respondents had sufficient knowledge of diabetes. These results do not reflect the finding of this study and could be due to the fact that this study had been done among diabetic patients and not in the general population.

When knowledge was compared to other variables, it was observed that poor knowledge dominated in all the age groups except the 50 – 59 years. Even a study conducted in a developed country set up, Baradaran and Knill-Jones found that knowledge about diabetes amongst ethnic groups in Glasgow was also very low in the different age groups (Baradaran, et al. 2006) that were studied. A significant association was observed between knowledge and type of occupation. Those who were unemployed and self employed had poor knowledge of diabetes.

Respondents who were able to identify diabetes risk factors it was observed that the majorly had good knowledge of diabetes in general. Therefore providing individuals with knowledge of diabetes is profoundly important. Because with this knowledge individuals will be aware of the risk factors as a result in conjunction with intervention programs (including behavioral change) people will be able to; take care of their health, have the ability to identify diabetes risks and take action early enough to prevent the onset of full blown diabetes. A good knowledge of diabetes was observed to

Study participants that had family members with diabetes (43.1%), had relatively a better proportion of respondents with good knowledge of diabetes compared to those who did not have diabetic family members. In a study done in the United Arabs (Al-Maskari., et al. 2013), showed that a history of diabetes in first degree relatives had a positive impact on diabetes knowledge. Having a close relative with a chronic disease may be a good source of health information. However; knowledge obtained directly from experts on the subject is

best, to ensure or eliminate any misconceptions that may be passed on from family member to family member.

Among the study participants it was observed that there was no statistical significant association between knowledge and level of education, but practically there should be an association between the two. Most likely this could have been affected by the presence of respondents with diabetic family members, who had relatively good knowledge of diabetes regardless of how high or low their formal education was.

Respondent were also tested on their knowledge of diabetes symptoms. Frequent urination and slow healing of wounds were readily identified at 85.1% and 63.1% respectively. The knowledge on the rest of the symptoms was proportionally low. In regards to complications, respondents scored high in identifying slow healing of wounds and erectile dysfunction as complications of diabetes. Most were unable to mention stroke, heart disease and amputation as complications. A study done by (El-Sadig, et. al. 2013) in the Emirate revealed that respondents had a high knowledge of diabetes symptoms and complications. This could have resulted from the fact that this study had been conducted amongst diabetic patients.

5.2.2 Attitude of study participants

Overall, respondents exhibited a negative attitude towards people with diabetes, more so in males than females among study participants. Respondents among peasants, those with primary education, the unemployed and the very young, $\leq$ 19 years had a negative attitude. The age group that had a relatively higher proportion with a positive attitude was the 50 to 59 year age group. Respondents with family diabetic family members and those with a tertiary education also had a positive attitude towards people with diabetes. This was also observed to be low in a study done with patients in Western Nepal. (Dinesh et al., 2007).

Ensuring a positive attitude towards diabetes amongst people in communities is crucial and essential when it comes to people's receptiveness to knowledge of diabetes. It is easier to instill knowledge of diabetes to those who have a positive attitude than those who exhibit a negative attitude. In short a positive attitude can act as a platform for fast learning and behavior change.

5.2.3 Knowledge of risk factors among the study participants

Prevention of diabetes greatly depends on the ability of individuals to identify diabetes risk factors. A little over half of the study participants were able to identify at least three of the diabetes risk factors. A substantial number of respondents knew of obesity, poor diet, age and lack of exercise to be risk factors of diabetes. The association between the overall knowledge of diabetes and specific knowledge of diabetes risk factors was highly significant. In contrast, respondents with diabetes in a study done in Tarlai (Ulvi, et al.2009) were unaware of most of the predisposing risk factors. Another study done in the rural communities of Pakistan showed that the majority were unaware of diabetes risk factors and that those few that were aware, it was purely because of the existence of a family member with diabetes.

5.2.4 Univariate and multivariate analysis of factors that influence knowledge of diabetes risk factors

A univariate analysis was done and certain factors; like presence of a diabetic family members, good general knowledge of diabetes and a positive attitude were found to be significant predictors of knowledge of diabetes risk factors. In a multivariate analysis that was done, respondents with diabetic family members were 2 times likely to have knowledge of diabetes risk factors compared to those without. In addition, respondents who had an overall general knowledge of diabetes were 13 times more likely to have a good knowledge of diabetes risk factors compared to those who had not receive a good knowledge of diabetes. So providing individuals with knowledge of diabetes is very important, because this knowledge is positively reflected in the individuals' knowledge of diabetes risk factors. It was also noted that respondents with diabetic family members, had a better knowledge on diabetes compared to those without. This implies that, if good structured information and education is provided to diabetic patients, that information is transferred to relatives of those with diabetes.

5.3 Limitations

- As the results of this study were from a single small area with only 255 participants sampled from a single community, the results may not be truly representative of all individuals in Tanzania.
- This study did not identify those with diabetes among the respondent. Such individuals could have higher knowledge due to the patient education provided at the clinic.
- The responses depended on the memory and truthfulness of the respondents which was assumed to be reliable.
- The entry of responses into the questionnaire depended on the interviewers' interpretation of the responses into the questionnaire. This was reduced by training of interviewers and use of people with medical background
- In a few households, adults were unavailable, and after two attempts were made to see them, another household had to be selected to replace it. Logistically this presented a challenge both in terms of finances and time.

CHAPTER SIX

6.0 CONCLUSION AND RECOMMENDATION

6.1 Conclusion

Knowledge about diabetes is a prerequisite for individuals and communities to take action to control diabetes. This study has shown that Sinza 'A' community has a significant low level of knowledge of diabetes, especially on its complications and risk factors associated with this disease. It was also observed respondents had a high proportion of individuals with a negative attitude towards diabetes. Unemployment, sex (male) and those at a very young age showed a negative attitude towards this disease. The majority of individuals who are aware and knowledgeable of the disease are only so because of the presence of a family member with the disease. To raise the awareness and knowledge of diabetes, a formal, structured approach should be designed to deliver the necessary educational information to different communities in Tanzania, through mass media and outreach health educational programs.

6.2 Recommendation

It is recognized that health promotion and education, based upon population knowledge and attitude regarding diabetes, is an essential component of a strategy aimed at disease control and prevention. There is a need for further in-depth studies to investigate the social and cultural perceptions of health in Tanzania in regards to diabetes. The main aim is to instill positive attitudes among individuals in the population. Knowledge is essential and positive attitude is a good start in the fight against any disease, diabetes included. These two can be used as a platform to eventually influence the right behavior regarding diabetes prevention.

Noting the growing disease burden in developing countries, it is thus recommended that further studies be done to evaluate diabetes knowledge in other districts among the rural and urban population so that comparative inferences can be drawn and intervention strategies formulated. Diabetes prevention greatly depends on recognition of its risk factors, so its

prevention interventions needs to target health education directed to the community, both affected and the general population.

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APPENDICES

Appendix I: Questionnaire (English)

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KNOWLEDGE AND ATTITUDE TOWARDS DIABETES, AND THE RISKS OF DEVELOPING DIABETES.

SECTION A-1 IDENTIFICATION

1. DATE OF INTERIEW | | | | | | |

DD MM Y Y

2. QUESTIONNAIRE NUMBER | | | |

3. NAME OF INTERVEWER …….

4. STREET …….

SECTION B: Social Demographic Characteristics

QCODE	QUESTION	RESPONSE AND CODEING
B1	Age	
B2	Sex	☐ Male ☐ Female
B3	Marital status	☐ Married ☐ Single ☐ Divorce ☐ Cohabiting. ☐ Separated ☐ Widow/widower

B4	Level of education	☐ No formal education ☐ Primary ☐ Incomplete primary ☐ Secondary ☐ Incomplete secondary ☐ Tertiary
B5	Occupation	☐ Civil servant ☐ Private ☐ Self employed ☐ Peasant ☐ House wife ☐ Others

C1: Knowledge of Diabetes and diabetes risk factors (please check participant's response or responses)

QCODE	QUESTION	RESPONSE AND CODING
C11	Have you ever heard of the disease called diabetes? **(If NO skip to C17)**	☐ Yes ☐ No
C12	To your understanding what is diabetes	☐ Elevated levels of blood sugar ☐ Body cannot process sugar ☐ Others
C13	Is it possible to test and be diagnosed with diabetes regardless of having symptoms or not?	☐ Yes ☐ No ☐ Do not know
C14	Does any member of your family have diabetes?	☐ Yes ☐ No ☐ Do not know
C15	(**If C14 is Yes**) Which member of your family has diabetes? PROBE **(circle all responses given)**	☐ Spouse ☐ Mother ☐ Father ☐ Sister ☐ Brother ☐ Daughter

		☐ Son ☐ Grandmother ☐ Grandfather ☐ Aunt ☐ Uncle ☐ Others
		AGE
C16	At what age did the individual above develop diabetes? (**Ages for all members mentioned above**)	Mother ……..... Father ……... Sister ……..…. Brother ……. Daughter …….. Son ……..….. Grandmother ……..….. Grandfather ……..…... Aunt ……..…..…. Uncle ……...…..…. Others …….……
C17	Have you heard of the term pre-diabetes? (the state in which some but not all of the diagnostic criteria for diabetes are met)	☐ Yes ☐ No ☐ Do not know
C18	Does having diabetes risk factors, greatly predispose one To the possibility of developing diabetes?	☐ Yes ☐ No ☐ Do not know
C19	What are the symptoms of diabetes (**check all responses given)**	☐ Frequent urination ☐ Persistence thirst ☐ Persistent hunger ☐ wounds take longer to heal ☐ Wasting ☐ Others
C110	Does family history of diabetes predispose one to the possibility of developing diabetes?	☐ Yes ☐ No ☐ Do not know

C111	If an individual is obese, do risks of developing diabetes increase?	☐ Yes ☐ No ☐ Do not know
C112	Does a woman diagnosed with gestational diabetes, have a higher risk of later developing diabetes?	☐ Yes ☐ No ☐ Do not know
C113	Does regular exercising lower the risk of developing Diabetes?	☐ Yes ☐ No ☐ Do not know
C114	Can a healthy diet of high fiber, fruits and vegetables, protect an individual from developing diabetes?	☐ Yes ☐ No ☐ Do not know
C115	As age progresses, does an individual have a higher risk of developing diabetes?	☐ Yes ☐ No ☐ Do not know
C116	In your opinion, how can a person reduce or eliminate the risk of diabetes PROBE **(check all responses given**)	☐ Maintain a healthy weight ☐ Healthy diet ☐ Increase physical activity ☐ Eat less fat ☐ Eat fruits and vegetables ☐ Others
C117	In your opinion what are the complications of diabetes? PROBE (**check all responses given**)	☐ Blindness ☐ Frequent infections ☐ Slow healing of wounds ☐ Kidney failure ☐ Heart disease ☐ Stroke ☐ Amputation ☐ Erectile dysfunction ☐ Delivering of big babies ☐ Others
C118	Can a thin individual get diabetes?	☐ Yes ☐ No ☐ Do not know

C119	Can an individual be diabetic without experiencing any Signs and/or symptoms?	☐ Yes ☐ No ☐ Do not know
C120	How else can diabetes affect other areas of one' life? PROBE (**check all responses given**)	☐ Increase financial needs ☐ Inability to work ☐ Coma ☐ Depression ☐ Death ☐ Others
C121	Changes in lifestyle can help manage diabetes successfully	☐ Yes ☐ No ☐ Do not know
C122	Does a person with diabetes have a greater chance of having complications such as heart attack, stroke, blindness, slow healing wounds and kidney disease?	☐ Yes ☐ No ☐ Do not know

C2: ATTITUDE (please circle participant's response)

TO WHAT EXTENT DO YOU AGREE OR DISAGREE WITH THE FOLLOWING STATEMENTS.

QCODE	QUESTION	RESPONSE AND CODING
C21	Diabetes is just exaggerated to be a serious chronic disease	Strongly agree …….1 Agree ……...…....2 Disagree ……...3 Strongly disagree ……4
C22	Nothing can be done to prevent diabetes	Strongly agree …….1 Agree …….....2 Disagree ……...3 Strongly disagree ……4

C23	Diabetes affects almost every part of a diabetic person's life	Strongly disagree ……....1 disagree ……2 Agree ……..…….……3 Strongly agree …….4
C24	Older people with diabetes do not usually get complications	Strongly agree ……..……..1 Agree ……..……2 Disagree ……..……...…3 Strongly disagree …….....4
C25	Physical activities plays a bid role in the prevention of diabetes	Strongly disagree ……1 Disagree ……...2 Agree ……..….3 Strongly agree …….4
C26	What a person with diabetes does , has more effect on the outcome of diabetes care than anything a health professional does	Strongly disagree ……1 Disagree ……..….2 Agree …….……..3 Strongly agree …….4
C27	Support from family and friends is important in dealing with diabetes .	Strongly disagree ……1 Disagree ……...2 Agree ……..…..3 Strongly agree …….……4
C28	Diabetes is a result of being bewitched	Strongly agree ……..…1 Agree ……..2 Disagree ……..3 Strongly disagree ……..…..4
C29	Eating healthy is very important when trying to avoid diabetes	Strongly disagree ……..…1 Disagree ……..2 Agree ……...3 Strongly agree …….....4
C210	Healthy foods are can be tasty and enjoyable	Strongly disagree ……..……1 Disagree ……...2 Agree ……...3 Strongly agree …….4

C211	For those at risk of developing diabetes, if you do enough exercise you can eat whatever you want	Strongly agree …….……1 Agree ……...2 Disagree ……..3 Strongly disagree ……4
C212	The emotional and physical effects of diabetes are pretty Big (Significant)	Strongly disagree …….……1 Disagree …….……..2 Agree ……..….3 Strongly agree ……..……...4

C3: PERCIEVED RISK OF DIABETES AND INDIVIDUALS' RESPONSIBILITY (PLEASE CIRCLE/CHECK)

QCODE	QUESTION	RESPONSE AND CODING
C31	Do you feel you could be at risk of developing diabetes?	☐ Yes ☐ No ☐ Do not know
C32	(**If C31 is yes)** Why? (Probe) **(If C31 is no skip to C33)**	☐ Diabetes family history ☐ Diabetic with my pregnancy ☐ Overweight ☐ Hardly Exercise ☐ Frequent urination ☐ Persistence thirst ☐ Persistent hunger ☐ wounds take longer to heal ☐ Wasting ☐ Others
C33	In case you were at risk of developing diabetes, where will you seek advice?	☐ Any health care provider ☐ Health facility ☐ Traditional healer ☐ Deal with it on my own ☐ Do not know
C34	Should individuals take responsible for their own health?	☐ Yes ☐ No

		☐ Do not know
C35	By having one member in the family with diabetes, is it your duty to inform yourself more on diabetes risk factors?	☐ Yes ☐ No ☐ Do not know

WE HAVE COME TO THE END OF THE QUESTIONNAIRE. THANK YOU FOR YOUR PARTICIPATION AND PATIENTS.

Appendix II: Questionnaire (Swahili)

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UELEWA NA MTAZAMO JUU YA KISUKARI PAMOJA NA VIASHIRIA VYAKE:

SEHEMU A-1 UTAMBULISHO

1. TAREHE YA MAHOJIANO | | | | | | |

DD MM YY

2 NAMBA YA DODOSO | | | |

4. JINA LA MHOJI…….

5. Mtaa …….

SEHEMU B: Social Demographic Characteristics

QCODE	QUESTION	RESPONSE AND CODEING
B1	Umri	
B2	Jinsia	☐ Mme ☐ Mke
B3	Hali ya ndoa	☐ Kwenye ndoa ☐ Kapera ☐ Achika ☐ Kuishi na mwenza ☐ Hatuishi pamoja ☐ Mjane
B4	Kiwango cha elmu	☐ Hajasoma ☐ Shule ya Msingi ☐ Sijamaliza msingi

		☐ Sekondari. ☐ Sijamaliza sekondari ☐ Chuo
B5	Kazi	☐ Serikalini ☐ Binafsi ☐ Mjasiriamali ☐ Mkulima mdogo ☐ Mama wa nyumbani ☐ Nyinginezo

SEHEMU C1: Ufahamu na Mtazamo Kuhusu Kisukari

QCODE	SWALI	RESPONSE AND CODING
C11	Je umeshawahi kusikia ugonjwa wa kisukari? **(kama hapana nenda swali C17)**	☐ Ndiyo ☐ Hapana ☐ Sijui
C12	Kwa uelewa wako kisukari ni ugojwa gani/	☐ Sukari kuzidi kwenye damu ☐ Mwili hau tumii sukari ☐ Mengineo
C13	Je inawezekana kupimwa na kugundulika kuwa na Kisukari bila kuwa na dalili?	☐ Ndiyo ☐ Hapana
C14	Je kuna ndugu yeyote kwenye familia mwenye kisukari?	☐ Ndiyo ☐ Hapana ☐ Sijui
C15	(**Kama C14 ni ndio**) Ni ngugu yupi katika familia mwenye kisukari ?	☐ Mwenza ☐ Mama ☐ Baba ☐ Dada ☐ Kaka

	Chunguza (**Tiki jibu/majibu yote sahihi**)	☐ Binti ☐ Mtoto wa kiume ☐ Babu ☐ Shangazi ☐ Mjomba ☐ Wengineo
		AGE
C16	Ni katika umri gani mtu/watu ulio mtaja/wataja hapo juu alipata kisukari? **(Jaza umri wa wote walotajwa hapo juu)**	Mama…….. Baba ……... Dada …….. Kaka …….. Binti …… Mtoto wa kiume…….. Bibi…….. …….. Babu …….….... Shangazi ……. Mjomba…….……..... Wengineo……
C17	Umeshawahi kusikia kitu kinaitwa ”hali inayoashiria uwezekano wa kupata kisukari” (hali ambayo baadhi Lakini sio vigezo vya vitambuzi vyote vinajulikana)	☐ Ndiyo ☐ Hapana ☐ Sijui
C18	Je kuwa na viashiria vya kisukari ni dalili inayo ashiria uwezekano mkubwa wa kuweza kupata kisukari?	☐ Ndiyo ☐ Hapana ☐ Sijui
C19	Je zipi ni dalili za kisukari unazozijua? (**tiki jibu/majibu yote upewayo**)	☐ Kukojoa mara kwa mara ☐ Kiu kisichoisha ☐ Njaa isiyoisha ☐ Muda mrefu kidonda kupona ☐ Kukonda
C110	Je historia ya kisukari kwenye familia inaweza kusabibasha mtu kupata kisukari?	☐ Ndiyo ☐ Hapana ☐ Sijui

C111	Kama mtu ni mnene (uzito ulio zidia), je uwezekano wa kupata kisukari unaonezeka?	☐ Ndiyo ☐ Hapana ☐ Sijui
C112	Je mama mwenye kisukari kipindi cha ujauzito yu hatarini zaidi kupata kisukari baadaye?	☐ Ndiyo ☐ Hapana ☐ Sijui
C113	Je kufanya mazoezi kunapunguza hatari (uwezekano)wa kupata kisukari?	☐ Ndiyo ☐ Hapana ☐ Sijui
C114	Je lishe bora yenye matunda na mboga za majani inaweza kumsaidia mtu asipate kisukari?	☐ Ndiyo ☐ Hapana ☐ Sijui
C115	Umri unavyosoge (ongezeka), je mtu yu hatarini zaidi kupata kisukari?	☐ Ndiyo ☐ Hapana ☐ Sijui
C116	Kwa maoni yako ni vipi mtu anaweza kupunguza viatarishi vya kisukari? Chunguza (**Tiki jibu/majibu yote utakayopewa**)	☐ Kuwa na uzito stahili ☐ Lishe bora ☐ Ongeza mazoezi ☐ Punguza mafuta ☐ Kula matuna na mboga ☐ Mengineyo
C117	Kwa maoni yako, niathari zipi zitokanazo na ugojwa wa kisukari? (**Tiki jibu/majibu yote utakayopewa**)	☐ Upofu ☐ Maradhi ya mara kwa mara ☐ Kidonda kupona taratibu ☐ Figo kutofanya kazi ☐ Ugojwa wa moyo ☐ Kupooza ☐ Kukatwa kiungo ☐ Kupungua nguvu za kiume ☐ Kuzaa mtoto wa uzito mkubwa ☐ Mengineyo
C118	Je mtu mwembamba anaweza kupata kisukari?	☐ Ndiyo ☐ Hapana ☐ Sijui

C119	Je mtu binafsi anaweza kuwa na kisukari bila kujisikia Ishara au dalili za kisukari/	☐ Ndiyo ☐ Hapana ☐ Sijui
C120	Je ni sehemu ipi nyingine ya maisha inayoweza kuathiriwa na kisukari? (**Tiki jibu/majibu yote utakayopewa**)	☐ Matuizi ya fedha kuongezeka ☐ Kushindwa kufanya kazi ☐ Kupoteza fahamu ☐ Masononeko ☐ Kupoteza maisha ☐ Wengineo
C121	Mabadiliko ya namna unavyo ishi (lishe,mazoezi ect.) Inaweza kusaidia namna ya kukabiliana (kusimamia) na kisukari kwa mafanikio.	☐ Ndio ☐ Hapana ☐ Sijui
C122	Je mtu mwenye kisukari ana uwezekanu mkubwa zaidi wa kupata athari (matatizo) yatokanayo na kisukari? kama mshtuko wa moyo, kupooza, upofu, vidonda kutopona taratibu na marathy ya figo	☐ Ndiyo ☐ Hapana ☐ Sijui

C2: MTAZAMO (TABIA) (tafathali tiki jibu sahihi)

NI KWA KIWANGO KIPI UNAKUBALIANA AU KUTO KUBALIANA NA TAARIFA ZIFWATAZO.

QCODE	QUESTION	RESPONSE AND CODING
C21	Kisukari ni ugonjwa unao tiliwa chumvi tu, kuwa ni ugojwa hatari na wa mda mrefu	Nakubaliana sana…….4 Nakubaliana……3 Sikubaliani……...2 Sikubaliani kabisa…....1
C22	Hakuna kinachoweza kufanyika kuzuia kisukari	Nakubaliana sana ……4 Nakubaliana...……..…...3 Sikubaliani…..……2

		Sikubaliani kabisa ……...1
C23	Kisukari kina athiri maeneo yote ya maisha ya mtu mwenye kisukari	Nakubaliana sana ……1 Nakubaliana...……...…...2 Sikubaliani…..…….3 Sikubaliani kabisa ……...4
C24	Wazee wenye kisukari huwa kwa kawaida hawapati matatizo yatokanayo na kisukari	Nakubaliana sana ……4 Nakubaliana...……...…...3 Sikubaliani…..…….2 Sikubaliani kabisa ……...1
C25	Mazoezi yana uzito mkubwa wa ku zuia kupelekeaKupata kisukari	Nakubaliana sana ……1 Nakubaliana...……...…...2 Sikubaliani…..…….3 Sikubaliani kabisa ……..4
C26	Kile anachokifanya mgojwa wa kisukari, kinauzito zaidi kwenye matokeo ya huduma ya walio na kisukari kuliko chochote kinacho fanywa na mtaalamu	Nakubaliana sana ……1 Nakubaliana...……...…...2 Sikubaliani…..…….3 Sikubaliani kabisa ……..4
C27	Msaada kutoka kwa wanafamilia na marafiki ni Muhimu kwenye kukabiliana na kisukari	Nakubaliana sana ……1 Nakubaliana...……...…...2 Sikubaliani…..…….3 Sikubaliani kabisa ……...4
C28	Kisukari hutokana na kulogwa	Nakubaliana sana ……4 Nakubaliana...……...…...3 Sikubaliani…..…….2 Sikubaliani kabisa ……...1
C29	Kula lishe bora ni muhimu sana, katika mikakati ya kuepuka kisukari	Nakubaliana sana ……1 Nakubaliana...……...…...2 Sikubaliani…..…….....3 Sikubaliani kabisa ……...4
C210	Vyakula vya lishe bora vinafurahisha (ladha)	Nakubaliana sana ……1 Nakubaliana...……...…...2 Sikubaliani…..…….3 Sikubaliani kabisa ……...4

C211	Kwa wale walio hatarini kupata kisukari wakifanya mazoezi ya kutosha wanaweza kula chochote wanachokitaka	Nakubaliana sana ……4 Nakubaliana...……...…...3 Sikubaliani…..…….....2 Sikubaliani kabisa ……...1
C212	Madhara ya kimwili na hisia kutokana na kuwa na kisukari ni kubwa sana	Nakubaliana sana ……1 Nakubaliana...……...…...2 Sikubaliani…..……3 Sikubaliani kabisa ……...4

3: HISIA YA VIASHIRIA VYA KISUKARI NA JUKUMU LA KILA MMOJA WETU

QCODE	QUESTION	RESPONSE AND CODING
C31	Je unajihisi unaweza ukawa u hatarini kupata kisukari?	☐ Ndiyo ☐ Hapana ☐ Sijui
C32	(Kama C31 ni ndio) kwa nini? Chunguza (kama C31 ni hapana ruka kwenda C33)	☐ Kisukari kwenye familia ☐ Kisukari wakati wa ujauzito ☐ kukojoa mara kwa mara ☐ Kiu kisichoisha ☐ Njaa isiyoisha ☐ Muda mrefu kidonda kupona ☐ Kukonda ☐ Mengineo
C33	Kama ukiwa u hatarini (vihatarishi) kupata kisukari ni wapi utaenda kupata ushauri?	☐ Muhudumu wa afya ☐ Kituo kitoacho huduma ya afya ☐ Mganga wa kienyeji

		☐ Nita jihudumia mwenyewe ☐ Mengineyo
C34	Je ,ni jukumu la kila mtu kuwajibika na afya yake	☐ Ndiyo ☐ Hapana ☐ Sijui
C35	Kw kuwa na ndugu mmoja mwenye kisukari kwenye Familia, ni jukumu langu kujielimisha zaidi juu yaviatarishi vya kisukari	☐ Ndiyo ☐ Hapana ☐ Sijui

WE HAVE COME TO THE END OF THE QUESTIONNAIRE AND THANK YOU FOR YOUR PARTICIPATION AND PATIENTS.

Appendix III: Consernt Forms (English)

MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCIES

Form no…….

I am **BEATRICE P. MUSHI** a student at Muhimbili University of Health and Allied Sciences (MUHAS), doing a study on Knowledge, attitude and individual's risk of developing diabetes Kinononi district Dar-es-salaam Tanzania. I have passed through your municipal health department authority leaders and they have granted permission for me to proceed with the study. However, I have met your community in-charge (street executive officer) and they have allowed me to proceed with my study.

Diabetes is an important cause of morbidity and mortality among people everywhere in the general population. It is also associated with increased in direct and indirect costs especially following its complications. Of all diagnosed diabetes 90% is attributed to T2DM, Luckily it is preventable.

The purpose of this study

To determine the level of knowledge and attitude towards one's potential risk of developing diabetes in relation to one's ability to identify diabetes risk factors.

Participation

If you accept to participate in the study, you will be asked some questions related to diabetes risk factors and prevention.

Confidentiality

All issues concerning your participation will be treated confidential; no any unauthorized person will have access to information. On your request, findings will be available at your Municipal Medical officer.

Risks

No harm or risk will be involved for those who will voluntarily participate in this study

Benefits

Participating in this study will give us an opportunity to understand how much you know about the disease and you will be in a position to know more about the disease on how to prevent against it, practices that predispose you to infection etc. Secondly, the information obtained can help authorities to plan for better intervention against this disease in your community in future.

Contact

Please if you have any enquires, doubt or claim do not hesitate to contact me by sending a letter using the following address: **BEATRICE P. MUSHI, MUHAS. P.O. BOX 65015 Dar es Salaam**. Moreover, if you have a serious question about your rights as a participant you may contact **Prof. Mainen J. Moshi,** Chairman of the Senate Research and Publications Committee**, P.O. BOX 65001, Dar es Salaam. Tel 2150302-6, 2152489.**

Agreement part

I therefore request you to participate in the study; participation in this study will involve asking some questions and you will be required to respond according to what you know on the given options.

DO YOU AGREE? YES: …… NO: …… (Tick for appropriate response)

If you agree, sign it below

Participant sign: …….. Date ……..

Data collector sign: ……. Date ……...

Appendix IV: Consent Form (Swahili)

CHUO KIKUU CHA SAYANSI YA AFYA NA SAYANSI SHIRIKISHI MUHIMBILI

Fomu ya Makubaliano

Namba ya utambulisho……..

Habari! Mimi naitwa **BEATRICE P. MUSHI** ni mwanafunzi katika Chuo Kikuu cha Sayansi ya Afya na Sayansi Shirikishi Muhimbili nikisomea shahada ya uzamili katika fani ya kuzuia ugonjwa wa kisukari.

Madhumuni

Nipo hapa wilaya ya Kinondoni kufanya utafiti juu ya uelewa na mtazamo wa watu kuhusiana na ugonjwa wa kisukari na vaatarishi vinayohusiana na ugonjwa huu. Pia nitapenelea kutafiti uelewa wa watu juu ya jukumu la kutambua wate walio hatarini kupata ugonjwa wa kisukari. Nimetoa taarifa za kuwepo kwangu kwa viongozi wa manispaa, wameniruhusu kuendelea na utafiti wangu. Aidha, nimefika katika ofisi za kata na serikali ya mtaa kutoa taarifa juu ya kuwepo kwangu, nao pia wameniruhu kuendelea na zoezi hili.

Ushiriki

Ushiriki katika utafiti huu ni hiyari kabisa. Endapo hutokubali hakuna hatua yoyote inayoweza kuchukuliwa dhidi yako na mtu yeyote yule na kwa namna yoyote ile. Utakachotakiwa ni kujibu maswali utakayoulizwa na mtafiti na utajibu kulingana na unavyoelewa juu ya ugonjwa huu.

Usiri

Taarifa zote za mshiriki ni siri, na hakuna mtu yeyote asiyehusika atakayeruhusiwa kuziona wala kuziingilia. Aidha, matokeo ya utafiti huu yatafikishwa katika ofisi ya mganga mkuu wa manispaa na zitapatikana pale zitakapohitajika.

Hatarishi

Zoezi hili halina madhara yoyote yale kwa mshiriki na mtu mwingine yeyote.

Faida

Kuweza kujua uelewa na mtazamo wa watu kuhusiana na kisukari na vihatarishi vinavyo husiana na ugonjwa huu katika wilaya hii. Hatimaye kuishauri serikali namna ya kuweza kuweka mipango ya kukabiliana na tatizo hili.

Mawasiliano.

Kwa yeyote mwenye kutaka kujua zaidi, anaweza kuwasiliana nami kwa anuwani ifuatayo; **BEATRICE P. MUSHI, MUHAS, S.L.P. 65015 Dar es Salaam.** Au unaweza kufanya mawasiliano na **Prof Mainen J. Moshi**, Mwenyekiti wa Kamati ya chuo ya utafiti na uchapishaji, **S.L.P. 65001, Dar es Salaam. Simu 2150302-6, 2152489.**

Kipengele cha makubaliano

Baada ya maelezo hapo juu, nakuomba sasa ushiriki katika utafiti wangu. Nitakuuliza maswali machache na utanijibu.

UNAKUBALI? **Ndiyo: …… Hapana: ……** (weka tiki panapostahili)

Kama jibu ni ndiyo, weka sahihi hapo chini:

Sahihi ya mshiriki: …….. Tarehe …….

Sahihi ya mtafiti: ……. Tarehe ….……