

**SELF-CARE PRACTICES AND ASSOCIATED
DETERMINANTS AMONG ADULT CLIENTS WITH
TYPE 2 DIABETES MELLITUS IN SELECTED
HEALTH CARE FACILITIES IN KIBWEZI EAST SUB-
COUNTY, MAKUENI COUNTY**

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**Self-Care Practices and Associated Determinants among Adult
Clients with Type 2 Diabetes Mellitus in selected Health Care
Facilities in Kibwezi East Sub-County, Makueni County**

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Technology**

2024

DECLARATION

This thesis is my original work and has not been presented for a degree any other University

Signature.....Date.....

Annah Nduku Musyoka

This thesis has been submitted for examination with our approval as the university Supervisors.

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DEDICATION

This work is dedicated to my husband, Felix Nzaluku, for his unwavering patience, composition and most importantly his love and psychological support throughout the Research period. He gave me support and encouragement, discussed ideas owing to his technical support. To my parents Mr. and Mrs. Patrick Musyoka for laying down solid educational foundation for me and their constant positive criticism during my Research period. To our sons, daughter and my siblings for moral support and encouragement during my study.

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ACRONYMS AND ABBREVIATIONS

CGM	Continuous Glucose Monitoring
DM	Diabetes mellitus
GDM	Gestation Diabetes Mellitus
IDF	International Diabetes Federation
IGT	Impaired Glucose Tolerance
KDHS	Kenya Demographic and Health Survey
MDGs	Millennium Development Goals
MOH	Ministry of Health
NACOSTI	National Commission for Science, Technology and Innovation
NCDs	Non- Communicable Diseases
SPSS	Statistical Package for Social Sciences
T2DM	Type 2 Diabetes Mellitus
WHO	World Health Organization

DEFINITION OF OPERATIONAL TERMS

- Type 2 diabetes mellitus** Chronic metabolic disorder developed in adulthood which is characterized by raised blood sugar levels for adults who have been on follow up in the diabetic clinic for at least one year prior to this study.
- Self-care** Is the active role individuals take into looking after their own health using the available information and knowledge.
- Diabetes self-care practice** The seven essential self-care behaviors towards managing their blood sugar levels including activities such as healthy eating, being physically active, monitoring blood glucose, compliance with medications, good problem solving, healthy coping and risk-reducing behavior.
- Regular blood sugar monitoring** The practice of testing the blood sugar levels at home for at least twice a week.
- Glycemic control** Maintaining a fasting blood sugar level of between 80-130 mg/dl

ABSTRACT

Type 2 diabetes mellitus (T2DM) is a chronic metabolic disorder which is characterized by raised level of sugar in the blood. Diabetes self-care practices are important to prevent diabetes related complications. This study aimed to assess self-care practices and associated determinants among adult clients with T2DM in Kibwezi East sub-county, Makueni County. An analytical cross-sectional design was conducted at Kibwezi East sub-county, Makueni County. Stratified random sampling technique was used to select health facilities. A total of 110 adults with T2DM were recruited through a census method. Researcher administered questionnaires were used to collect data. The tool had four sections comprising of socio-demographic characteristics, level of knowledge assessed using Diabetic knowledge test, socio-economic factors and summary of diabetic self-care activities (SDSCA). Statistical package for social sciences (SPSS) version 27 was used to analyze quantitative data. Descriptive statistics used included percentages and frequencies to calculate the of the socio-demographic characteristics of study participants, their level of knowledge and self-care practices Chi-square/fisher exact test and binary logistic regression and Multivariate logistic regression were used to establish association between level of knowledge and self-care practice of the study participants and also the relationship between socio-economic factors associated with self-care practices at 95% CI and p value ≤ 0.05 . Data was presented in pie charts, bar graphs and frequency tables. Majority of the study participants were female (62.7%, n=69), with 46.4% aged above 51 years with 32% having attained post diploma as the highest level of education. The level of self-care practices was found to be poor among majority (n=86, 78.2%) of the study participants. The level of knowledge concerning self care practices was based on Revised Brief Diabetes Knowledge Test (DKT2). Those who scored <10, 11-16 and 17 items and above were classified as having poor, moderate and good level of knowledge respectively and 60% were rated to have poor level of knowledge on selfcare practice. However, on bivariate analysis there was no significant relationship on between level of knowledge and self-care practices (X^2 value²= 1.27, df= 1, p value = 0.258). Significant association on bivariate analysis for socio economic factors; psychological support, source of spiritual support, net income of the participant and mode of paying for services was observed. The level of self-care practices was found to be poor among the study participants. Being knowledgeable about self-care practices does not translate to practice of the same. Health care providers to emphasise on the on practical rather than the theoretical aspect of all self care practises among T2DM patients. In conclusion, provision of psychological and spiritual support from family and church and use of social health insurance increases the likely hood of better selfcare practice.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Diabetes mellitus (DM) is a chronic metabolic disorder which is characterized by raised level of sugar in the blood (Niguse, *et al.*, 2019). It is one of the non-communicable diseases. Diabetes self-care practices are important to prevent diabetes related complications (Basu, *et al.*, 2018). Diabetes self-care practices include therapeutic management such as adhering to medication and diet as advised by the health care professionals, behavioral adaptation which comprises of adopting new behavioral strategies that improve the disease outcome(Gurmu *et al.*, 2018).The Ministry of Health and health stakeholders identified seven routine practices that are essential for individuals living with diabetes, which include: good eating habits, maintaining physical fitness through regular exercises, consistent checking of blood glucose level, excellent skills in solving hardships, risk reduction behavior, adherence to medication and finally living healthy lifestyle. Such kind of lifestyle behavior is recommended to persons living with diabetes or those at risk of diabetes.

Worldwide, the prevalence of diabetes was 10.5 % (536.6 million) in 2021, and is anticipated that the prevalence will go up to 11.3 % (642.7 million) in 2030 and 12.2 % (783.2 million people) by 2045(International diabetes Federation, IDF, 2021). In the same report by IDF, 81% of these patients live in third world nations (IDF, 2021). In the year 2021, diabetes had claimed 6.7 million lives (IDF,2021) Research reveals that improving self - care among individuals suffering from type 2 diabetes mellitus (T2DM) requires proper self-care routine.(Niguse, *et al.*, 2019). Inadequate self-care practices may deteriorate the condition which leads to unwanted outcomes (Thapa, 2018).

Globally, approximately 75–80% of people with diabetes die due to lack of diabetes self-care especially cardiovascular and nephropathy complications(American Diabetes Association,2020).Diabetes mellitus, especially, Type 2 DM complications are increasing much more rapidly because of increasing obesity, reduced activity

levels as countries become more industrialized, and the aging of the population Diabetes mellitus is a complex chronic illness demanding continuous medical and self-care(ADA,2020).

Diabetes self-care, which includes activities such as healthful eating, regular physical activity, foot care, medication adherence, and self-monitoring of blood glucose, is very important to keep the disease under control. The American Diabetic Association underlined that diabetic self-care is necessary to limit potential organ damage, and it can reduce the likelihood of hospitalizations and emergency visits.¹⁰ Patient knowledge concerning disease and self-care practices for patients is important to achieve the desired treatment targets and for the appropriate management of their disease.

The main contributor in keeping diabetes under control is diabetes self-care. It is documented globally that 95% of individuals with T2DM or their families carry out diabetes self-care. Considering diabetes is a chronic condition, (Zewdie, *et al.*, 2022). Diabetes Self Care is considered a key concept for its management and control (Carpenter *et al.*, 2019). In diabetes care, self-care practices are important in promoting patients' effectiveness towards managing the disease (Ngari, *et al.*, 2020).

In Africa, individuals living with T2DM stands at 24 million. The burden is predicted to increase in Sub-Saharan Africa to approximately 55 million by 2045 (Lee, *et al.*, 2019). In Sub-Saharan Africa, majority of people with T2DM live in poor socio-economic set up (Adisa, *et al.*, 2017).

Kenyan prevalence of T2DM ranges from 3.5% to 4% with 15,284 deaths attributed to diabetes complications (IDF, 2021). These complications include nerve, heart, eye and kidneys problems (Mugo, 2018).

Self-care practices have a positive association with improvement of diabetes quality life and excellent glycemic prevention. (Gupta.*et al.*,2020 and Niguse, *et al.*, 2019). Few research studies have been done on self-care in diabetes in Makueni in county. Therefore, it is important to assess self-care practices and associated determinants among adult clients with T2DM in Kibwezi East sub-county, Makueni County.

1.2 Problem Statement

Deficiency of skills and appropriate knowledge of self-care practices worsens the burden of the diabetes each year (Shrivastava, *at el.*, 2013). Managing the gaps in knowledge and self-care practices among patients with diabetes delays the onset of diabetes complications and reduces the overall burden. (Mufunda, Ernerson, & Hjelm, 2018; WHO, 2022).

In Kibwezi East Sub County, statistical figures released by the Ministry of Health (MoH) of Kenya on T2DM, indicated that it had an annual increase prevalence of 10% more than the national prevalence at 4% (MoH, 2019& KHIS Data base).

Also, being one of the Semi-Arid areas in Makueni County, insufficient dietary intakes and low-income levels increase the chances of developing diabetic related complications. At Kibwezi East Sub-County health facilities, there are approximately more than 400 individuals with T2DM (Kibwezi East Sub County statistics, 2021). They are normally given health education on behaviors that enhance self-care practices.

Nevertheless, during a preliminary survey done in the month of October 2021 in the health facilities, there was an increase of 5% of the diabetic patients' admission due to diabetes related complications (Kibwezi East Sub County statistics, 2021).

Kibwezi East Sub County statistics indicated 38% increase in the number of patients with T2DM admitted as a result of poor self-care practices (Kibwezi East Sub County statistics, 2021). The patients were not following the dietary recommendations, complying to pharmacotherapy, foot care practices, regular exercises and blood sugar monitoring. This caused serious health consequences at individual, family and society level. Lack of individual diabetes self-care practices amongst the clients visiting the health facilities lead to more admissions and diabetes complications like cardiopathy, retinopathy, neuropathy, nephropathy and limp amputations. Although much research has been done on T2DM, little has been done focusing particularly on self-care practice among persons with T2DM in Kibwezi Sub-East County. This study therefore seeks

to establish self-care practices and associated determinants among adult clients with type 2 diabetes mellitus in Kibwezi East Sub-County, Makueni County

1.3 Justification

T2DM has increasingly become a global burden worldwide and specifically in developing countries (Saeedi, et al.2019). According to Alsayed, *et al* (2022) diabetes self-management is important in reducing diabetes-related complications. If the current situation is not curbed, many Kenyans will be dying of diabetes related complications, which can be prevented through self-care practices. Therefore, the current research results will improve the nursing body of knowledge and efforts will be put in place to ensure diabetic patients do not develop diabetic related complications.

Previous studies have documented that self-care practices can maintain glycemic levels within normal ranges (Gupta, *et al.*,2020). Diabetic patients will benefit from reduced number of admission due to complications related to diabetes. This will minimize hospital costs and improve the income index of the family. Admission of patients with diabetes related complications usually increases the workload of those in health sector and strains the hospitals in terms of resources. Therefore, minimizing the diabetes related complications and readmissions, hospitals can use the extra money to procure other essentials and improve service delivery. This study will also help both the National and County government in policy making to scale up health promotion and preventive services for diabetic patients.

In Kibwezi East Sub County, statistical figures released by the Ministry of Health (MoH) of Kenya on T2DM, indicated that it had an annual increase of 10% more than the national prevalence at 4% (MoH, 2019& KHIS Data Base). Kibwezi East continues to have a high prevalence of TDM2 than the national prevalence (Kibwezi East Sub County statistics, 2021).

The study is uniquely in a rural set up whose study findings contribute to the body of knowledge at family levels and community levels on self care management of the disease. The study will also provide more information to be shared with the

Community Health Promoters on diabetes self -care as they work towards Health promotion and Disease prevention at the community/family levels improving the County Health Indicators.

1.4 Research Questions

1. What is the level of self-care practice among adult clients with type 2 diabetes mellitus in selected health care facilities in Kibwezi East sub-county, Makueni County?
2. What is the influence of level of knowledge on diabetes self-care practice among adult clients with type 2 diabetes mellitus in selected health care facilities in Kibwezi East sub-county, Makueni County?
3. What are the socio-economic factors influencing diabetes self-care practice among adult clients with type 2 diabetes mellitus in selected health care facilities in Kibwezi East sub-county, Makueni County?

1.5 Objectives

1.5.1 Broad Objective

To assess self-care practices and associated determinants among adult clients with type 2 diabetes mellitus in selected health care facilities in Kibwezi East sub-county, Makueni County.

1.5.2 Specific Objectives

1. To assess the level of self-care practice among adult clients with type 2 diabetes mellitus in selected health care facilities in Kibwezi East sub-county, Makueni County.
2. To determine the influence of the level of knowledge on diabetes self-care practice among adult clients with T2DM in selected health care facilities in Kibwezi East sub-county, Makueni County.
3. To determine socio-economic factors influencing diabetes self-care practice among adult clients with T2MD in selected health care facilities in Kibwezi East sub-county, Makueni County.

1.6 Hypothesis

1. **H₀₁**: There is no significant association between level of knowledge and diabetes self-care practice among adult clients with T2DM in selected health care facilities in Kibwezi East Sub- County, Makueni County
2. **H₁**: There is a significant association between level of knowledge and diabetes selfcare practice among adult clients with T2DM in selected health care facilities in Kibwezi East sub county, Makueni County
3. **H₀₂**: There is no significant association between socio-economic factors and diabetes self-care practice among adult clients with T2DM in selected health care facilities in Kibwezi East sub-county, Makueni County
4. **H₂**: There is a significant association between socio-economic factors and diabetes self-care practice among adult clients with T2DM in selected health care facilities in Kibwezi East Sub County, Makueni County

1.7 Theoretical Framework

This research was guided by theory of self-care deficit theory proposed by Dorothea Orem. According to Orem, clients should be able to perform self-care practices towards promoting self-efficacy and whenever their capacity is altered, the individual, through nursing support can recover their ability through direct care and educational support (Hemmati, et al., 2012). The theory presents an appropriate clinical guideline for planning and implementing self-care principles. In this study the researcher applies the theory in the assessment of the self-care abilities of the study subjects termed as the self-care practices in T2DM management.

Dorothea Orem's Self-Care Deficit Theory defined nursing as the act of assisting others in the provision and management of self-care to maintain or improve human functioning. It focuses on each individual's ability to perform self-care. The theory identifies five methods of helping: acting for and doing for others; guiding others; supporting another; providing an environment for promoting personal development in relation to meet future demands; and teaching one another.

The theory of nursing systems describes how the patient's self-care needs were met by the nurse, the patient, or by both. Dorothea Orem identified three classifications of nursing system used to meet the self-care requisites of the patient: wholly compensatory system, partly compensatory system, and supportive-educative system. The results of the study contribute to the improvement of the latter classification of the nursing system as viewed by Dorothea.

Dorothea Orem recognized that specialized technologies were usually developed by members of the health care industry. Dorothea Orem also identified social and interpersonal relationships. In this category, communication was adjusted to age and health status. The nurse helped to maintain interpersonal, intra-group, or inter-group relations for the coordination of efforts. The nurse also maintained a therapeutic relationship in light of psycho social modes of functioning in health and disease. In this category, human assistance adapted to human needs, actions, abilities, and limitations was given by the nurse. Effective mutual communication between nurses and patients was vital in enhancing selfcare practices among patients with T2DM.

1.8 Conceptual Framework

Dependent variable was self-care practices for persons living with T2DM, which was classified as good level of self-care practice (Mean score ≥ 3) and poor level of self-care practice (Mean score < 3). Independent variables included socio-demographic characteristics, clinical profile, level of knowledge and socio-economic factors. The level of knowledge was classified as low, average and high level of knowledge. Socio-economic factors included education level, occupation of study participants, income level and social support.

Independent Variables

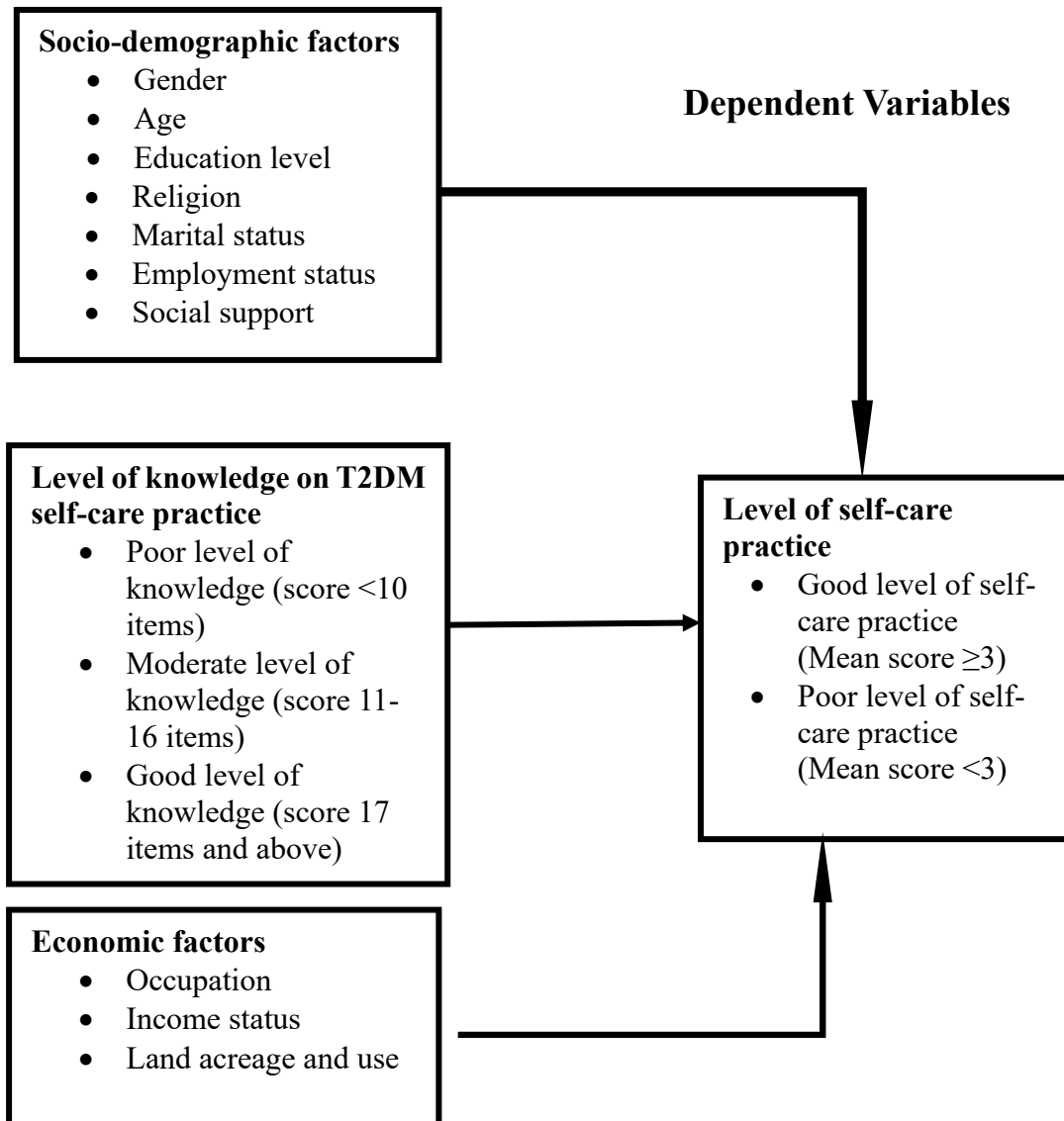


Figure 1.1: Conceptual Framework

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Self-care practices are a set of behavioral practices used by individuals suffering from diabetes in order to manage and control the disease on their own. These self-care practices are found to have an association with blood glucose levels and thereby reduce the incidence of complications associated with diabetes. Various studies and evidence show that when a patient performs self-care practices in a correct and systematic manner, they can improve blood sugar control. These practices have proven effective in achieving the therapeutic goals of diabetes.

In this chapter, review of literature on T2DM was based on specific objectives.

2.1 Social Demographic Characteristics Related to Self-Care Practice among Individuals with Type 2 Diabetes Mellitus

Selfcare practice among TD2M individuals has been diversely featured in various studies.

A China based study on factors influencing self-care behaviors reveled that sex and religion were among other factors the significant predictors of self-care behaviors' study witnessed that being female patient had a higher level of self-care behavior than being a male patient (Hu Y, *et al.* 2022)

A study done by (Zewdie, et al.,2022) in Ethiopia on self-care practice among TD2M found out that the higher the age, the likely hood that a participant failed to practice self-care (AOR 0.334, 95% CI 0.135, 0.823). Educational level of the participants in the study seemed to also not influence the participants' practice of self-care.

In Nigeria a study on self-care practices among of persons with TD2M attested that age, gender, marital status, educational level significantly influenced self-management

practices (Okafor, C. N. et al., 2024). Similar findings were demonstrated in a Kenyan study done at Thika level five Hospital (Wamucii, *et al.*, 2020).

The need to examine the social demographic factors comprehensively in a rural study set up to see if the factors so reflect like indicate in other studies.

2.2 Level of Self-Care Practice among Individuals with Type 2 Diabetes Mellitus

In order to maintain a tight glycemic control, blood glucose level needs to be frequently measured. The Kenya National Clinical Guidelines for the management of diabetes mellitus stipulate that for patients with stable T2DM blood glucose is monitored at least 4 tests in a week on 4 consecutive days or on alternate days (including 1 FBG and 3 postprandial values). For stable T2DM patients on insulin paired testing at least 3-4 days a or as frequently as possible with at least fasting blood sugar test and one more pre-prandial value every day, (MOH 2018).

In India, blood sugar control was ranked the top followed by medication compliance (Chinnappan, *et al.*, 2020). Similarly, a study done by (Agidew *et al.*, 2021) reported that blood sugar measurement was at 85%. In Kenya, research done in Thika level 5 hospital revealed that self-glucose monitoring was rarely done since there was scarcity of the testing kits among the patients with T2DM. Poverty was a factor causing this challenge as most families could not afford the glucometers (Wamucii, *et al.*, 2020).

It is currently accepted that the appropriate diet in treatment of diabetes is one that is high in carbohydrates and fiber and low in fat (ADA, 2016). In Ethiopia, statistics indicated that 49% of the individuals with T2DM had good self-care behavior (Katema, *et al.*, 2020). Categorically, pooled estimates on dietary practices stood at 50%, blood glucose control at 28%, physical exercises at 49% and foot-care was 58% (Katema, *et al.*, 2020). In 2017, only 35.9% of the diabetic patients were found to have good diabetic dietary practices in Ethiopia (Demilew, *et al.*, 2018) and in 2021 it was found to be at 46.1% (Takele, *et al.*, 2021). However, in 2021, a study in Northeastern Ethiopia showed that 63.8% of the patients had sufficient self-care dietary practices (Gulentie, *et al.*, 2020). In Kenya, a study done in Thika Level 5 hospital indicated that adherence to diabetic diets was low at 4.2% (Wamucii, *et al.*, 2020).

There are clinical benefits of incorporating a regular exercise program into management of diabetes; the earlier the exercise program is started, the greater its benefits. Eighty-one percent of individuals living with T2DM in Nepal reported to perform moderate exercises (Dwa & Panthee, 2021). Similarly, a study done in Kancheepuram, Tamil Nadu revealed a very low percentage of individuals with T2DM (5.6%) having good self-care practices. More than forty percent of individuals with T2DM reported they performed moderate exercise. In India, approximately 53.75% patients with T2DM had a moderate score on self-care exercises (Chinnappan, *et al.*, 2020). However, insufficient routine exercises were reported in Coastal Karnataka among individuals suffering from T2DM (Shrivastva, *et al.*, 2020). This means counseling on the importance of exercising should be emphasized to all diabetic patients.

Study conducted in Saudi Arabia indicated that most individuals with T2DM performed well in medication domain (Alotaibi & Bandar, 2020). Similarly, another study done in Ethiopia indicated that compliance with medication and blood sugar testing was higher as compared to foot care (Chenchu, *et al.*, 2020).

Foot problems are commonly reported complication of diabetes and may result in hospitalization and sometimes require surgical intervention, which can lead to a lifetime disability and low quality of life. Reports indicated that 18.8% of individuals with T2DM in Nigeria did foot examination (Ugwu, *et al.*, 2020). Furthermore, the statistics indicated that healthcare workers who took part in comprehensive examining of foot were 12.55% while 12.9% conducted annual eye screening (Ugwu, *et al.*, 2020). Similarly, a study done by Chinnappan *et al.*, (2020) ranked foot care as the lowest performed self-care activity together with physical activity. In Kenya, research done in Thika level 5 hospital revealed that there was low self-care practice among the patients with T2DM at 35.8%, and rarely did the patient inspect and care for their feet (Wamucii, *et al.*, 2020). Therefore, oral and written advices are important to improve foot care among diabetic patients.

2.3 Level of Knowledge on Self-Care Practices among Individuals with Type 2 Diabetes Mellitus

According to (Beck *et al.*, 2018), the level of knowledge on self-care practices among patients with T2DM in Kuwait was higher compared to Kenyan practices. Similarly, a study done in India by (Tiruneh *et al.*, 2019) revealed that patients with T2DM had higher level of knowledge on self-care practices. They knew the problems related to T2DM and this led to improved self-care practices by them performing physical exercise and avoiding sedentary lifestyle (Tiruneh *et al.*, 2019). According to Lee *et al.* (2019), despite majority of the patients with T2DM having adequate knowledge on diabetes, there was limited literature from sub-Saharan Africa on knowledge on self-care practices. In another study done by Ojobiet *et al.*, (2017), it was demonstrated that awareness of diabetes played a role in self-care behaviors among persons with T2DM. Literate patients with T2DM were more likely to monitor their disease progression and adhere to self-care practices.

A study done (Mogre, *et al.*, (2017) in Ghana, showed that patients with T2DM with higher level of knowledge were more likely to adhere to the laid down self-care practices. Higher level of knowledge was associated with higher level of self-care practice, especially on adherence to healthy diet and foot care (Mogre, *et al.*, 2017). Those patients with high level of knowledge followed instructions of the physician on drug adherence and clinic follow up for checkup (Alharbi, *et al.*, 2016). However, Wang *et al.*, (2019) demonstrated that patients with T2DM who had poor coping skills and self-care practices were those with low level of knowledge. According to (Basuet *et al.*, (2018) poor level of knowledge among individuals with T2DM affected self-care activities. Further, in another study, patients with low level of knowledge knew less about their illness which led to diabetes related complications (Gopalan, *et al.*, 2018).

It has been documented that there was high level of literacy and information about diabetes among individuals with T2DM in Europe compared to Africa (Cheng, *et al.*, 2016).

Alharbi *et al.*, (2016), indicated that literacy level among patients with T2DM played a vital role in enhancing self-care behavior. According to Wang *et al.*, (2018), high

level of knowledge among persons with T2DM towards self-care practices, enhanced diabetes mellitus monitoring. This was further emphasized by Lee *et al.*, (2019) who stated that knowledge was an important predictor of self-care practices among patients with T2DM.

2.4 Socio-Economic Factors Influencing Self-Care Practices among Individuals with Type 2 Diabetes Mellitus

(Wang *et al.*, 2019) suggested that education among patients with T2DM was a solution towards promoting self-care practices. (Gurmu *et al.*, 2018) emphasized that education empowered patients with T2DM and this led to good self-care practices. He further indicated that level of education of individuals with T2DM significantly influenced self-care practices. Individuals with T2DM who were highly educated had a greater understanding of DM self-care practices and they were able to monitor their blood glucose, pressure and cholesterol (Gurmeet *et al.*, 2018). Similarly, a study conducted in Turkey among persons with T2DM revealed that those who were educated exhibited improved skills in management of diabetes (Marciano, *et al.*, 2019). Self-care behaviors of DM remained the cornerstone of diabetes care with the level of education affecting every effort of the disease management. High level of education among persons living with T2DM enhanced them to efficiently manage the illness (Niguse, *et al.*, 2019).

A Pakistan study identified that socio-demographic such as monthly household income, patient's choice of private or public hospital for treatment, played a decisive role in the healthcare practices among type-2 diabetes patients. The same study featured that Income had positive role in average and good self-care levels of practices (Imran Hameed Khaliq, *et al.*, 2019).

Also, (Basu, *et al.*, 2018), reported that occupations where diabetic patients spent a large proportion of their time at work with no break hindered self-care behaviors. This is a clear indication that work place could be an arena for management of diabetes given that there were favorable conditions which promote adequate self-care practices among patients with T2DM.

A study done by Lee, *et al.*, (2019) indicated that limited income led to reduced access to hospital services and information which affected self-care practices for persons with T2DM. Similarly, another study done by Cho *et al.*, (2018) showed that lack of enough income denied patients with T2DM from seeking subsequent treatment and visiting diabetic clinic for close monitoring of the blood sugars.

A study done by Azami *et al.*, (2018) established that being employed was associated with better socio-economic status which increased the chances of treatment compliance for those with T2DM. Whereas financial problems were featured as a barrier to self-care practice among study participants in a Nepal study (Adhikari, *et al* 2021).

A study done by Aquino *et al.*, (2018) revealed that availing aid to those suffering from T2DM enhanced their ability to practice self-care behaviors. (Lee, *et al.*, 2019) argued that members of the family were considered important source of social support to those with T2DM in order to maintain self-care practices.

Social support from family documented highest performing self-care activity and showed a positive and significant correlations with performance of self-care activities in a study done at a Saudi Arabian hospital (Hasan, *at al.*, 2024).

However, another study indicated that relatives were not willing to support patients with T2DM patients and this hindered self-care behaviors (Thapa, 2018).

2.4 Summary of Literature Review

Our literature reviewed different studies in relation to the study objectives. The studies revealed that self-care practices of patients with T2DM remained a huge global challenge. Self-care practices entailed clients managing and controlling their diet, adhering to anti-diabetic medication and performing physical exercise at least for 20 minutes in a day all of which promote utilization of glucose in the body. This can help to prevent problems originating from uncontrolled blood glucose levels.

2.5 Gap in Literature Review

Following the reviewed literature, majority of the studies concentrated on knowledge level on diabetes mellitus general management, few dealt with specific self-care practices. Also, there was paucity of published data on association between level of knowledge and self-care practices among patients with T2DM.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Study Design

Analytical cross-sectional study design was utilized. The study design was quantitative in nature. The study design demonstrated the relationship between level of knowledge, socio-economic factors and the level of self-care practices among patients with T2DM. The choice of the sturdy design was to collect data at a single point in time.

3.2 Study Area

Being one of the 47 counties in Kenya, Makueni County is located in lower Eastern region. The County extends in an area of 8,034.7 sq km with a population size of more than 900,000 people according to 2019 census. The county is surrounded by Kajiado, Taita Taveta, Machakos and Kitui counties. The climate in this region is arid and semi-arid. Chulu hills in Kibwezi west constituency, Mbooni hills in Mbooni subcounty and Kilungu hills marks the major geographical features found in this region. The county is made up of six sub-counties namely: Makueni, Kibwezi East, Kibwezi West, Kilome, Kaiti and Mbooni. The Sub County has a population of 80,236 people according to 2019 Census of whom 4,695 are classified Urban. It has four Locations: Kinyambu, Kikumbulyu, Masongeleni and Utiithi. The study was conducted in selected health care facilities within Kibwezi East Sub-County. The sub-county has nineteen (19) dispensaries and seven (7) health centers. Majority of patients attending diabetic clinics in these facilities emerge from the community. The health facilities are operated by nurses, clinicians with or without physicians. The study selected Kinyambu, Kambu dispensaries, Kibwezi Health center and Dwa health centers.

3.3 Study Population

The study population was adult patients with T2DM utilizing outpatient diabetic clinic at Kibwezi East Sub-County health facilities. The Sub-County had approximately 400 clients who were attending the diabetic clinics with a diagnosis of T2DM with an average of 110 clients attending per month

3.4. Sample Size Determination

The sample size was determined using (Fisher *et al.*, 1998) formula as cited by (Mugenda and Mugenda 2003).

$$n = \frac{Z^2 P(1 - P)}{d^2}$$

Z corresponding CI level (i.e., 1.96 for 95% CI);

d is boundaries of error (i.e., 0.05 = ± 5%) and

p is the approximated proportion of a sample with condition of interest.

P= 56.6% the number of T2DM patients practicing self-care (Weledegebriel, *et al.*, 2021)= 0.5

$$n = \frac{1.96^2 \times 0.5(1 - 0.5)}{0.05^2}$$

$$n = 379$$

For a population size that was less than 10,000 individuals, Yamane's (1967) formula was employed to adjust the proportion of the sample size.

$$nf = \frac{n}{1 + \frac{n}{N}}$$

Where n f= required sample size

n= computed sample size

N= the figure of persons living with T2DM utilizing health facilities within Kibwezi East sub-county which was approximately 155 patients per month

$$nf = \frac{379}{1 + \frac{379}{155}}$$

$$nf = 110$$

Total sample size = 110 persons living with T2DM.

3.5 Eligibility Criteria

3.5.1 Inclusion Criteria

1. Patients above 18 years diagnosed with T2DM irrespective of their blood sugar control status
2. Patients diagnosed with T2DM for more than 1 year before the study on regular follow up at the outpatient diabetic clinic.

3.5.2 Exclusion Criteria

1. Critically ill and mentally sick T2DM patients attending out-patient diabetic clinic.

3.6 Sampling Method

Health facilities were sampled using stratified random sampling. First, the health facilities were put into two strata: Health centers and Dispensaries. A sample frame was done for all the strata (health centers list and Dispensary list) and numbering done on pieces of papers for random selection. Then, two health facilities were randomly selected from each of the two strata. From the first and second strata, Dwa and Kibwezi Health centers and Kambu and Kinyambu dispensaries were randomly selected respectively. The second stage of sampling involved census of all patients with T2DM in each of the sampled health facilities. Table 3.1 displayed the number of study participants who took part in the study.

Table 3.1: Study Participants to be Sampled from The Health Facilities

Level of health facility	Name of the health facility	Total number of patients attending diabetic clinic
Health center	Kibwezi	38
Dispensary	DWA	34
	Kambu	15
	Kinyambu	23
Total		110

3.7 Data Collection Tools

Data collection was performed using a structured questionnaire. The structured questionnaire was in both English and local language of the region (Kikamba). The tool had four sections comprising of socio-demographic characteristics, level of knowledge assessed using Diabetic knowledge test, socio-economic factors and summary of diabetic self-care activities (SDSCA).

Revised Brief Diabetes Knowledge Test (DKT2) was used to assess knowledge on management of diabetes mellitus (Fitzgerald, et al., 2016). The tool for knowledge had 23 items, diabetic patients who scored above 17 items were categorized as having good knowledge, those who scored between 11 items and 16 had moderate knowledge and those who scored 10 and below items had poor knowledge (Fitzgerald, et al., 2016).

Summary of diabetic self-care activities questionnaire was accessed from SDSCA estimates revised from seven research outcomes (Toobert & Glasgow, 1994). Diabetic self-care behaviors were measured by SDSCA tool. The self-care behaviors included: general diet intake, physical exercises, specific diet, blood glucose monitoring, adhering to treatment foot management and smoking. The overall mean score was obtained by dividing total sum of all means of each domain by the sum of queries under each scale. Overall mean score ≥ 3 was considered as good while < 3 as poor self-care activities (Toobert & Glasgow, 1994).

3.8 Pretesting of Study Tools

The data collection tool was pretested on 11 T2DM patients (10% of the sample size). The pretesting was done at Matiliku health center in Kibwezi west. This area for pretesting was chosen because it had the same characteristics as that of the study area. Inputs from pretesting were used to modify the study tool before the actual data collection period.

3.9 Validity and Reliability of Study Tool

Validity of the study tools was ensured by pre-testing of 10% of the structured questionnaires. The questions were analyzed to ensure clarity, precision and

inclusiveness. This consequently enhanced good understanding of the questions by the research assistants. The data collected during the pre-testing was cross checked and analyzed to assess the data quality. The questions were then adjusted accordingly to ensure validity of the study tools. The participants were assured confidentiality and reassured that no victimization would be introduced due to their responses to ensure validity of the study tools.

A structured pre-tested questionnaire was used in order to standardize its reliability, to ensure that when it was used by the same or a different investigator the results were the same. Cronbach’s alpha was used to determine the reliability of the instrument. Table 3.2 showed an average of 0.82 Cronbach’s alpha. All the variables registered a Cronbach’s alpha coefficient of above 0.7, which implied high reliability.(Taber, 2018).

Table 3.2: Study Participants to be Sampled from the Health Facilities

Variable	Number of items	Cronbach’s alpha
Socio-demographic characteristics and clinical profile	17	0.88
Diabetic knowledge	23	0.73
Socio-economic factors	15	0.87
Self-care practices	11	0.79
Average		0.82

3.10 Data Collection Method

Authority to carry out the study was obtained from Makueni director of medical services and Kibwezi medical superintendent. Patients with T2DM seeking out-patient services at the diabetic clinic gave informed consent to participate in the study. The process of data collection took 4 weeks on diabetic clinic days until the required sample size was achieved. Gathering of information was done using interviewer administered questionnaire. Two trained research assistants were used to collect the data. The research assistants were nurses holding a degree in nursing and had a previous record of participating in researches. The research assistants were conversant and fluent local language Kikamba.

3.11 Data Analysis

The gathered quantitative data was organized, counterchecked for completeness and quality and entered into statistical package of social sciences (SPSS) version 27 software for analysis. The Descriptive statistics used included percentages and frequencies to calculate the of the socio-demographic characteristics of study participants and level of self-care practices among the study participants. Chi-square/fisher exact test and binary logistic regression used to test for the association between level of knowledge and self-care practice of the study participants and also the relationship between socio-economic factors associated with self-care practices among the study participants.

Significant variables on Chi-square/fisher exact test among socioeconomic factors were further subjected to multivariate logistic regression to establish the relationships with self-care practices at 95% CI and p value ≤ 0.05 .

3.12 Ethical Consideration

Approval of the research was granted by University of Eastern Africa Baraton Ethics and Review Committee (UEABERC) (Ref number UEAB/ISERC/24/11/2022). Permission to carry out the research was obtained from National Commission for Science, Technology and Innovation (NACOSTI) (Ref number NACOSTI/P22/22551). Authority to conduct the study was requested from medical superintendent at Kibwezi sub-County health facilities. Then in charge of out-patient department was informed. Written informed consent was filled and signed by the study participants before commencing data collection process. In addition, the study participants' confidentiality of personal information was guaranteed. Names of the study participants did not appear anywhere in the questionnaire during data collection. All the ethical principles were followed during the research.

CHAPTER FOUR

RESULTS

4.1. Introduction

This chapter presented the research findings of the study with reference to specific research objectives. The chapter presented the data using charts and descriptive tables. The response rate was 100% for the study.

4.1 Socio-Demographic Characteristics of Study Participants

The study gathered information on the socio-demographic characteristics of the study participants concerning their age, gender, marital status, education level, religion, duration of diabetes, and employment status. Majority of the study participants were female (62.7%, n=69) while minority male (37.3%, n=41). It was found that almost a half of study participants (46.4%, n=51) were aged above 51 years. Thirty-five (31.8%) study participants were aged between 41-50 years while 21.8% (n=24) were aged between 30-40 years. On the level of education, (32.7%, n=36) had the highest level of education as post diploma, followed by those with diploma (29.1%, n=32) and the least had primary level of education (8.2%, n=9). More than 70% of the study participants were Christian (72.7%, n=80) while minority (27.3%, n=30) were Muslims. Approximately a half of the study participants (51.8%, n=57) were employed. Seventy percent of the study participants were married with the minority (8.2%, n=9) single. It was noted that majority of the study participants 60% (n=66) residence was urban, however, (40%, n=44) were residing in a rural area (Table 4.1).

Table 4.1: Socio-Demographic Characteristics of the Study Participants

Variable	Category	Frequency	Percentage
Gender	Female	69	62.7
	Male	41	37.3
Total		110	100
Age	30-40	24	21.8
	41-50	35	31.8
	Above 51	51	46.4
Total		110	100
Education level	Informal	12	10.9
	Primary	9	8.2
	Secondary	21	19.1
	Diploma	32	29.1
	Post diploma	36	32.7
Total		110	100
Religion	Muslim	30	27.3
	Christian	80	72.7
Total		110	100
Employment status	Employed	57	51.8
	Unemployed	13	11.8
	Self employed	40	36.4
Total		110	100
Marital status	Single	9	8.2
	Married	77	70
	Divorced	12	10.9
	Widowed	12	10.9
Total		110	100
Residence	Rural	44	40
	Urban	66	60
Total		110	100

4.2 Level of Self-Care Practices among the Study Participants

The level of self-care practices was evaluated using the summary of diabetes self-care activities (SDSCA) questionnaire. The questionnaire had findings about the self-care practices performed for the last seven days. The scoring was done from zero to seven days, however, for the statement on how many days the patient took high fat diet and number of days the patient smoked, the scoring was reverse coded: 0=7, 1=6, 2=5, 3=4, 4=3, 5=2, 6=1, and 7=0. The number of items used to score the self-care practices were 11 and the highest score was seven. Summary of the findings were shown in table 4.3.

Majority of the study participants (31.8%, n=35) took recommended balanced diet for three days in a week. Thirty-six study participants (32.7%, n=36) took recommended eating schedule for two days. Approximately 80% of the study participants (78.2%, n=86), did not take meals at 5 o'clock or more vegetables. For the days the study participants took food with high fat (red meat/dairy products), (35.5%, n=39) took it for six days. All the study participants did not take part in physical workouts in the previous one week.

Most of the study participants did not exercise for half an hour as recommended (89.1%, n=98). Those who screened for blood pressure for two days in the previous one week were (51.8%, n=57). Study participants who monitored blood glucose as recommended, for two days was (53.6%, n=59). Forty-eight-point two percent (n=53) inspected their feet for 2 days. More of the study participants (67.3%, n=74) inspected their shoes for 2 days in the previous week. Majority of the study participants did not smoked cigarettes for 7 days in the previous week (59.1%, n=65) (Table 4.2).

Table 4.2: Self-Care Practices for the Study Participants

Variable	0	1	2	3	4	5	6	7
Days patient took recommended balanced diet	18(16.4%)	12(10.9%)	24(21.8%)	35(31.8%)	21(19.1%)	0%	0%	0%
Days patient took recommended eating schedule	18(16.4%)	0%	36(32.7%)	35(31.8%)	21(19.1%)	0%	0%	0%
Days patient took meals at 5 o'clock or took more vegetables	86(78.2%)	12(10.9%)	12(10.9%)	0%	0%	0%	0%	0%
Days patient ate food with high fat (red meat/ dairy products)	0%	0%	0%	24(21.8%)	23(20.9%)	24(21.8%)	39(35.5%)	0%
Days patient did blood screening as Doctors instructions	0%	0%	59(53.9%)	0%	0%	0%	0%	41(46.1%)
Days patient exercised for half an hour	98(89.1%)	12(10.9%)	0%	0%	0%	0%	0%	0%
Days patient screened their blood pressure	53(48.2%)	57(51.8%)	0%	0%	0%	0%	0%	0%
Days patient monitored blood glucose	51(46.4%)	59(53.6%)	0%	0%	0%	0%	0%	0%
Days patient inspected feet	21(19.1%)	53(48.2%)	12(10.9%)	0%	0%	0%	0%	24(21.8%)
Days patient inspected their shoes	0%	74(67.3%)	12(10.9%)	0%	0%	0%	0%	24(21.8%)
Days patient smoked cigarette	65(59.1%)	0%	0%	0%	0%	0%	25(22.7%)	20(18.18%)

Overall, mean score ≥ 3 and < 3 was considered as good and poor self-care practice respectively (Toobert & Glasgow, 1994). The self-care practice level for each study participant was then computed. The level of self-care practices was found to be poor among majority (n=86, 78.2%) of the study participants (Figure 4.1).

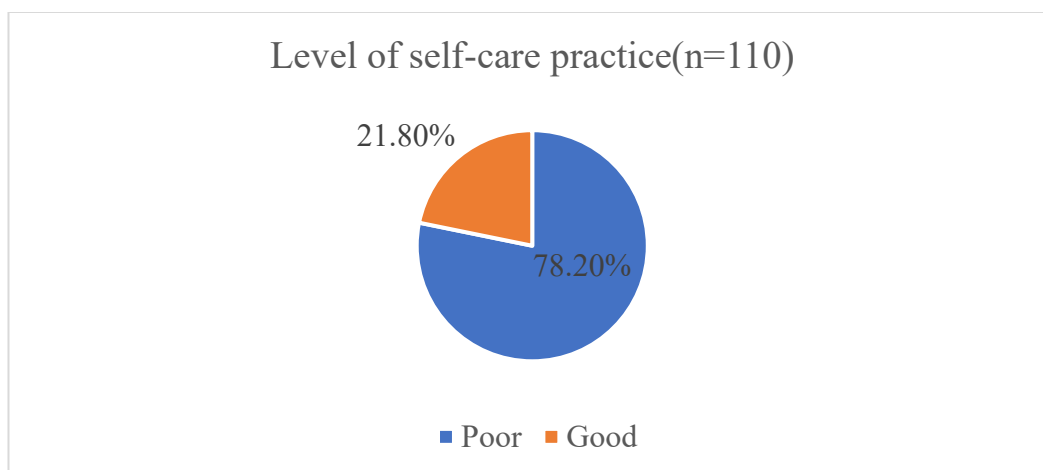


Figure 4.1: Level of Self-Care Practices for the Study Participants

4.3 Association between the Level of Knowledge and Self-Care Practices of the Study Participants

4.3.1 Descriptive statistics of Knowledge of Study Participants on Self Care Practices

The study participants' knowledge on self-care practices was assessed using Revised Brief Diabetes Knowledge Test (DKT2). Majority of the study participants 77 (70%), 59(53.6%), 62(56.4%), 99(90%), 74(67.3%), and 56(50.9%) had knowledge on recommended diet for DM person, carbohydrate foods, impact of exercise on blood glucose level, impact of infections on blood glucose level, causes of low blood glucose and high blood glucose level respectively.). Majority of the study participants 51(46.4%), 74(67.3%), 77(70%), 75(68.2%), 56(50.9%), 101(91.8%), 65(59.1%), 56(50.9%), 86(78.2%), 69(62.7%), 75(68.2%), 89(80.9%), 98(89.1%), 78(70.9%), 77(70%), 57(51.8%), and 56(50.9%) did not have knowledge on foods with high fat content, foods considered as 'free food', recommended duration to estimate blood glucose level, HBA1c, best method for glucose testing at home, impact of unsweetened juice on blood glucose, recommended management of low blood glucose level, foot

care practices, effect of eating foods with low fat content, signs of nerve damage in DM, complications of DM, symptoms of ketoacidosis, recommended diet for DM person with flu, half-life of rapid acting insulin, recommended measures to take in case of missed insulin dose, symptoms of low blood glucose level, and effects of taking insulin and avoiding breakfast meal on blood glucose respectively (Table 4.3).

Table 4.3: Knowledge of the Study Participants on Self-Care Practices

Variable	Knowledgeable	
	No	Yes
Knowledgeable on recommended diet for DM person	33 (30%)	77 (70%)
Knowledgeable on carbohydrate foods	51(46.4%)	59(53.6%)
Knowledgeable on foods with high fat content	74(67.3%)	36(32.7%)
Knowledgeable on foods considered as ‘free food’	77(70%)	33(30%)
Knowledgeable on recommended duration to estimate blood glucose level	77(70%)	33(30%)
Knowledgeable on HBA1c	75(68.2%)	35(31.8%)
Knowledgeable on best method for glucose testing at home	56(50.9%)	54(49.1%)
Knowledgeable on impact of unsweetened juice on blood glucose	101(91.8%)	9(8.2%)
Knowledgeable on recommended management of low blood glucose level	65(59.1%)	45(40.9%)
Knowledgeable on impact of exercise on blood glucose level	48(43.6%)	62(56.4%)
Knowledgeable on impact of infections on blood glucose level	11(10%)	99(90%)
Knowledgeable on foot care practices	56(50.9%)	54(49.1%)
Knowledgeable on effect of eating foods with low fat content	86(78.2%)	24(21.8%)
Knowledgeable on signs of nerve damage in DM	69(62.7%)	41(37.3%)
Knowledgeable on complications of DM	75(68.2%)	35(31.8%)
Knowledgeable on symptoms of ketoacidosis	89(80.9%)	21(19.1%)
Knowledgeable on recommended diet for DM person with flu	98(89.1%)	12(10.9%)

Variable	Knowledgeable	
	No	Yes
Knowledgeable on half-life of rapid acting insulin	78(70.9%)	32(29.1%)
Knowledgeable on recommended measures to take in case of missed insulin dose	77(70%)	33(30%)
Knowledgeable on symptoms of low blood glucose level	57(51.8%)	53(48.2%)
Knowledgeable on causes of low blood glucose	36(32.7%)	74(67.3%)
Knowledgeable on effects of taking insulin and avoiding breakfast meal on blood glucose	56(50.9%)	54(49.1%)
Knowledgeable on causes of high blood glucose level	54(49.1%)	56(50.9%)

Knowledge levels were categorized into three: those who scored <10, 11-16 and 17 items and above were classified as having poor, moderate and good level of knowledge (Fitzgerald, et al., 2016). The study findings indicated that majority of the study participants (60%, n=66) had scored below 10 items thus, had poor level of knowledge while the remaining proportion of the participants (40%, n=44) scored between 11-16 items and had moderate level of knowledge (Figure 4.2).

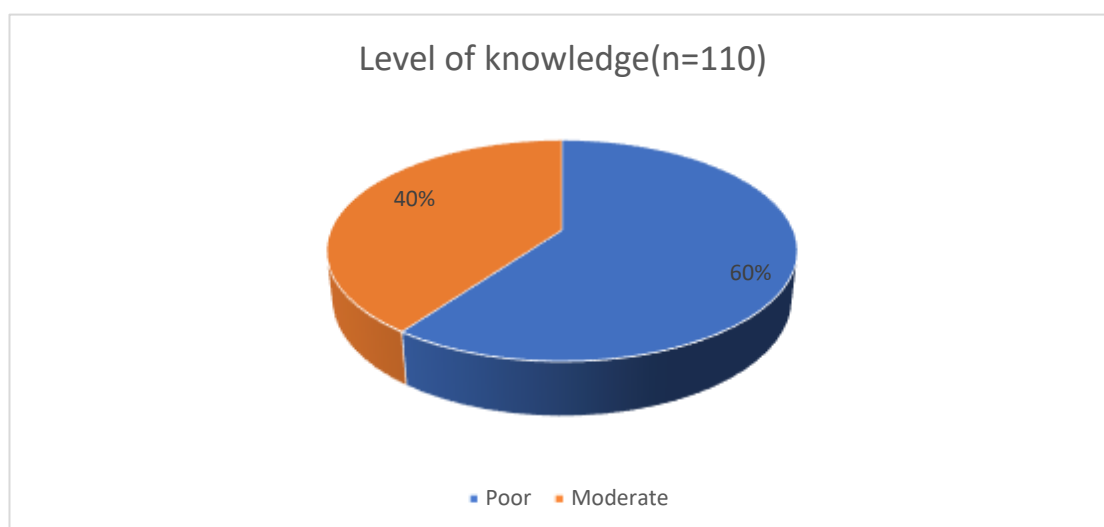


Figure 4.2: Level of Knowledge among the Study Participants

4.3.2 Association of Level of Knowledge and Self-Care Practice of Study Participants

To find the association between level of knowledge and self-care practice, chi-square test was done. This was found not to be statistically significant (χ^2 value²= 1.27, df= 1, p value = 0.258) meaning that there was no association between the participants level of knowledge on the seven T2DM self-care practices and actual self-care practice (Table 4.4).

Table 4.4: Chi-square Test of Association between Level of Knowledge and Self-Care Practice of the Study Participants

Variable	Level of self-care practice		df	Chi-square value	p-value	
	Good	Poor				
Level of knowledge	Good	54	12	1	1.27	0.258
	Poor	32	12			
Total		86	24			

4.4 Socio-Economic Factors Associated with Self-Care Practices among the Study Participants

4.4.1 Descriptive Statistics of Socio-Economic Factors

A. Level of Education

Level of education was measured to indicate literacy level of the study participants. Thirty percent and 31.8% of the study participants had diploma and post diploma level of education respectively (Figure 4.3).

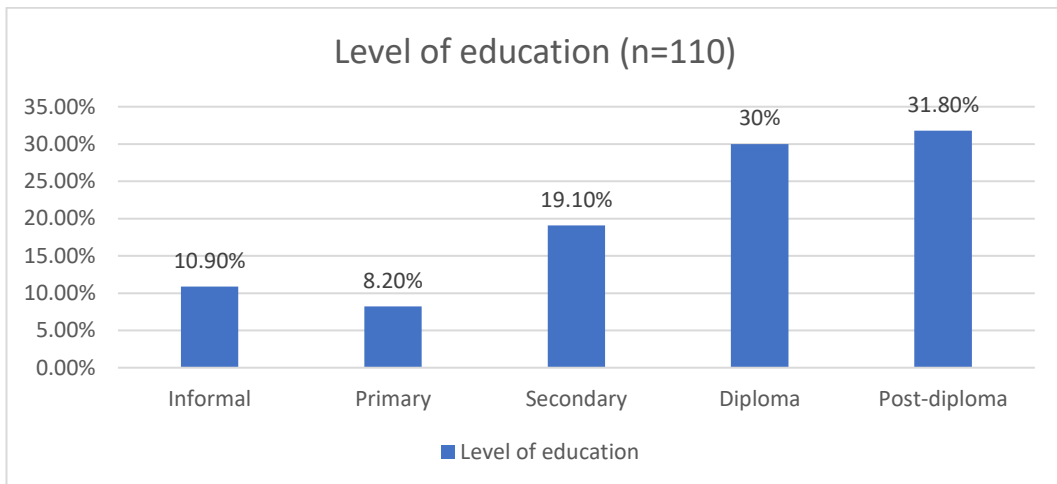


Figure 4.3: Level of Education for the Participants

B. Source of Psychological Support

Majority of the study participant (48.2%, n=53) reported to have been getting their psychological support from the hospital staffs who attended to them whenever they went to the diabetic clinic. The least proportion (18.2%, n=20) received their psychological support from friends.

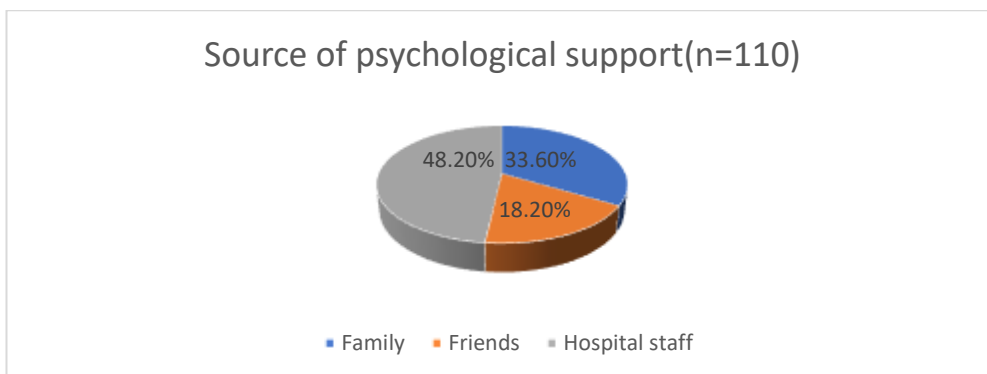


Figure 4.4: Source of Psychological Support

C. Source of Spiritual Support

The researcher inquired how the study participants gathered their spiritual support. It was found that majority of the study participants (63.7%, n=45) reported to have being spiritually supported by their family members as shown (Figure 4.5).

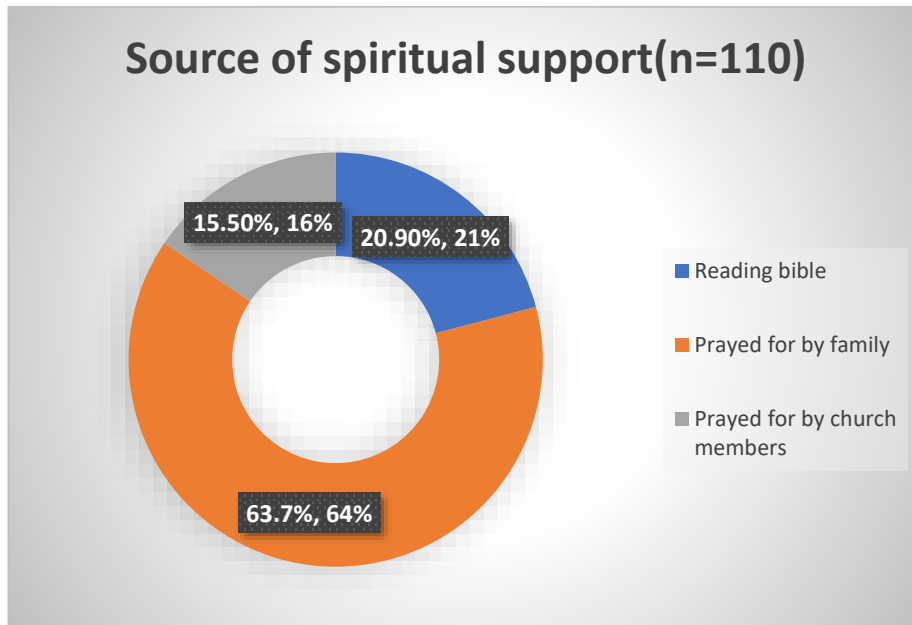


Figure 4.5: Source of Spiritual Support

D. Frequency of Providing Guidance and Counseling

The researcher inquired how frequent the study participants received guidance and counselling. It was found that majority of the study participants (40.9%, n=45) reported to have the guidance and counseling offered monthly while 40% (n=44) weekly (Figure 4.6).

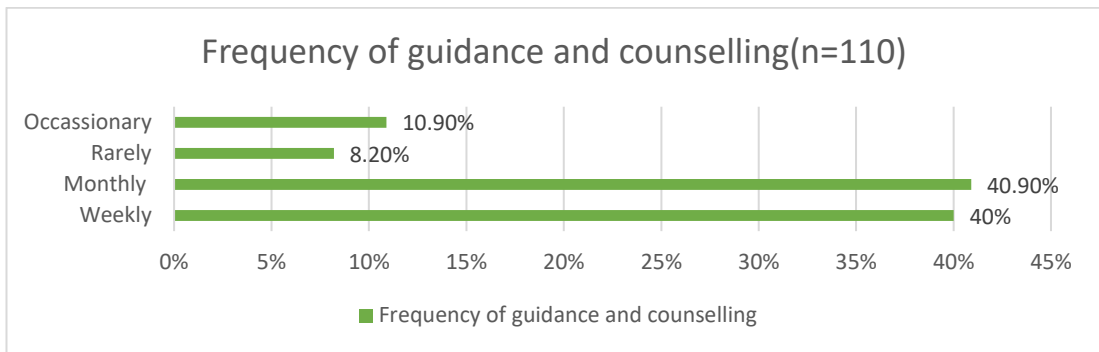


Figure 4.6: Frequency of Providing Guidance and Counseling

E. Frequency of Fellowship

Majority of the study participants (91.8%, n=101) reported to have been participating on daily fellowship with family and friends. Minority of the study participants (8.2%, n=9) reported to have been participating on fourth night fellowship with family and friends (Figure 4.7).

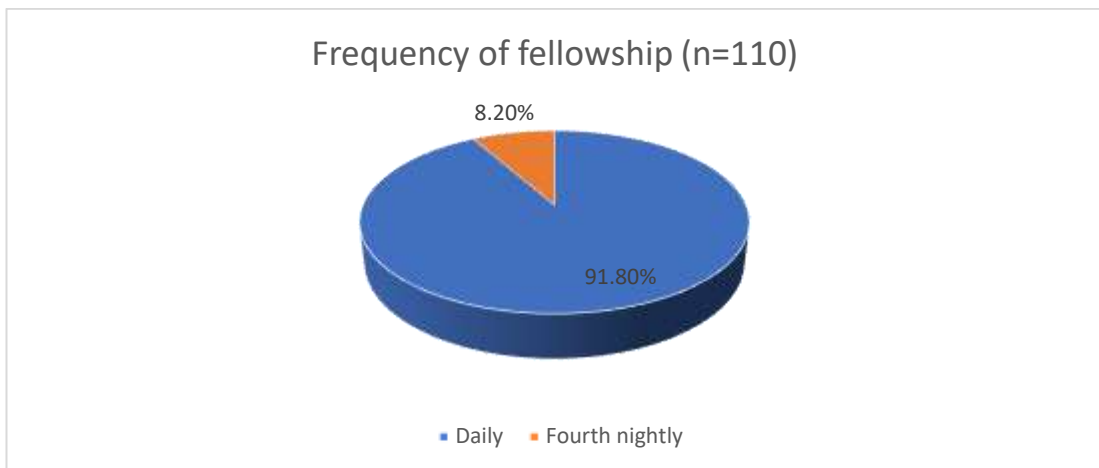


Figure 4.7: Frequency of the Study Participants Participating in Fellowship with Family and Friends

F. Frequency of Participating in Social Activities

Majority of the study participants (38.2%, n=42) reported to be participating in the social activities in the community at least once a month with the least proportion (30%, n=33) doing it weekly (Figure 4.8).

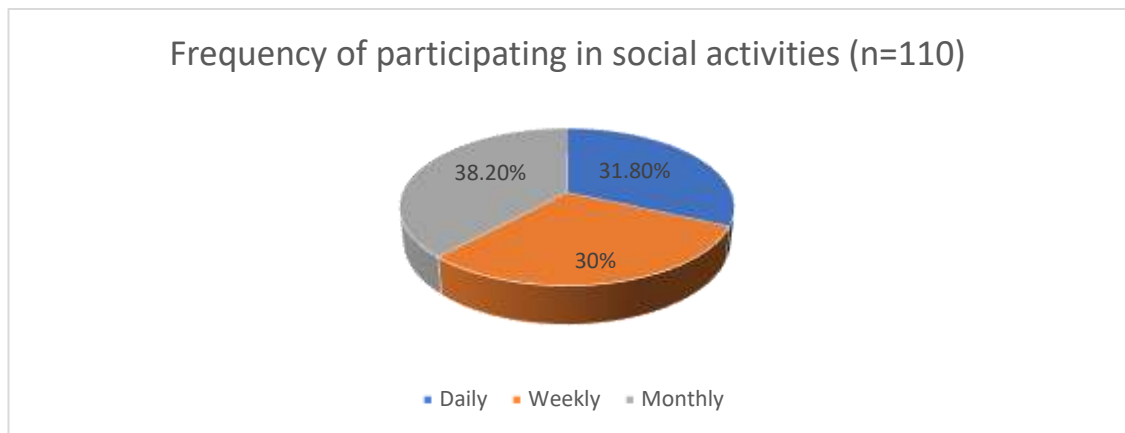


Figure 4.8: Frequency of Study Participants Participating in Social Activities in the Community

G. Frequency of Receiving Material and Physical Support

It was found that majority of the study participants (32.7%, n=36) received monthly material support while 89.1% (n=98) received daily physical support (Figure 4.9).

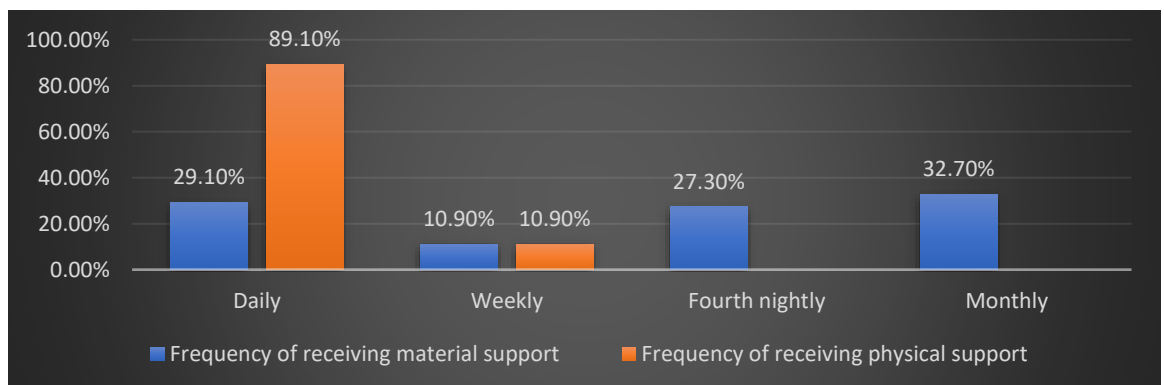


Figure 4.9: Frequency of Receiving Material and Physical Support

Net Income Per Month of the Study Participants

The study found that majority of the study participants (80.9%, n=89) were earning net income of above Kshs. 20 000 while the least 8.2% (n=9) earned between Kshs. 15 000 to Kshs. 20 000 (Figure 4.10).

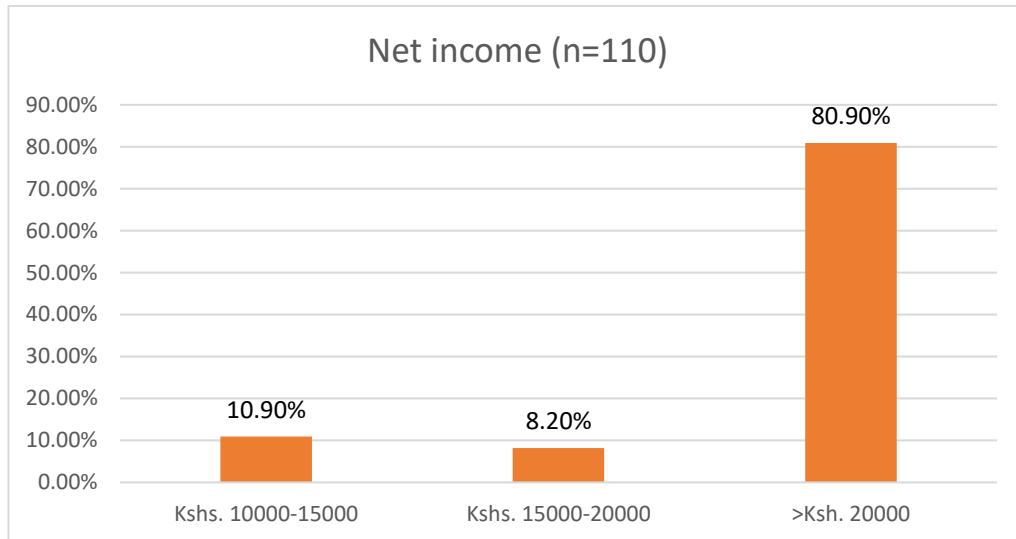


Figure 4.10: Net Income per Month of the Study Participants

I. Approximate Hectares of Land Ownership

Land ownership was considered to relate to the economic capability of the study participant and so their possibility of using the land for gardening and supplement balanced diet. The study participants reported to have different sizes of land. Most of the study participants (40%, n=44) owned more than 15 hectares of land (Figure 4.11).

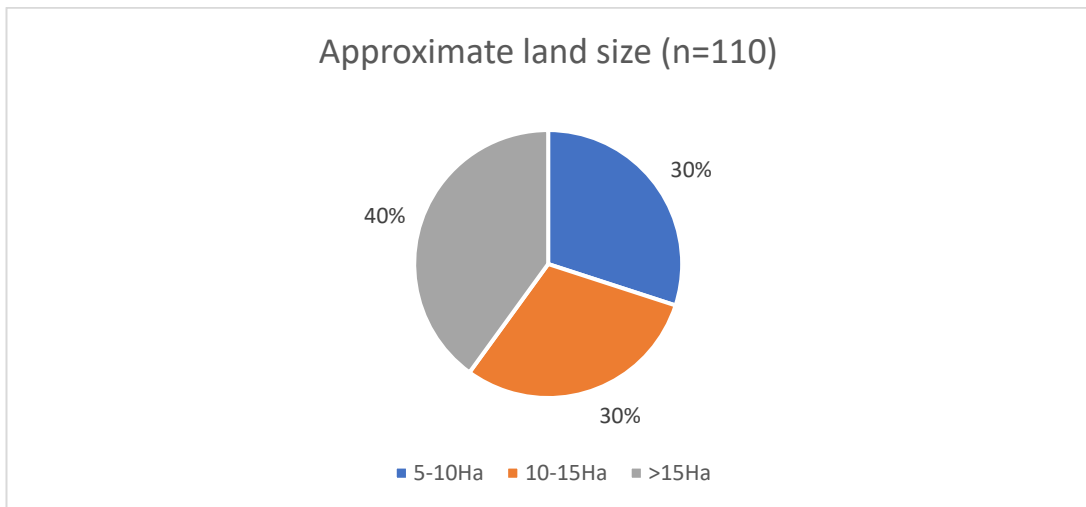


Figure4.11: Approximate Acreage of Land Ownership

J. Land Use Among the Study Participants

The study participants reported to use their land differently. Majority of the study participants (50.9%, n=56) were using it for animal farming, while minority (10.9%, n=12) leased their land

Most sturdy participants never engaged in crop farming especially on crops made for diabetic slow releasing sugars like millet, finger millet, sorghum and vegetables. Most of them relied on food from the shops which are mostly refined foods which made it difficult in blood sugar controls. (Figure 4.12).

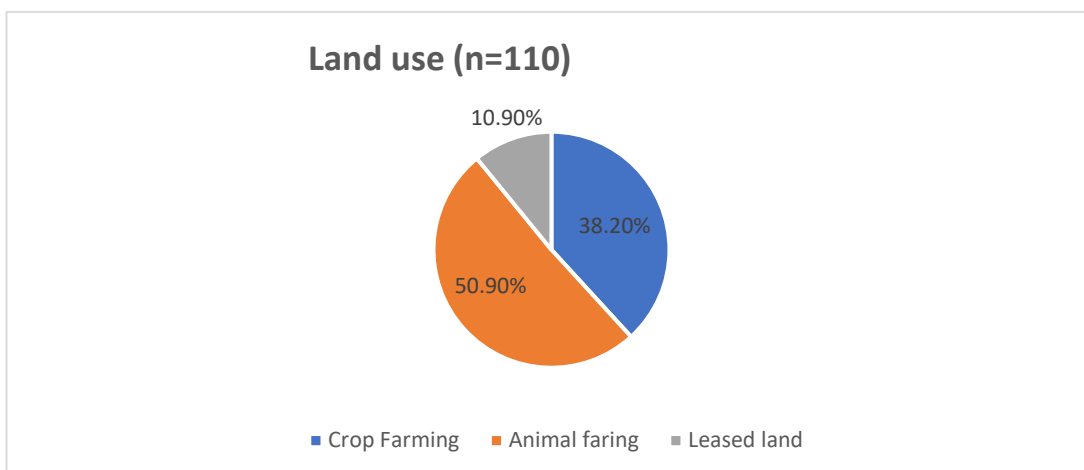


Figure 4.12: Land Use among the Study Participants

K. Mode of Paying for Services

Majority of the study participants (91.8%, n=101) were using insurance cards that was (32.7%, n=36) were using National Health Insurance Fund (NHIF) while (59.1%, n=65) other insurance cards (Makueni Kivutha medical card) (Figure 4.13).

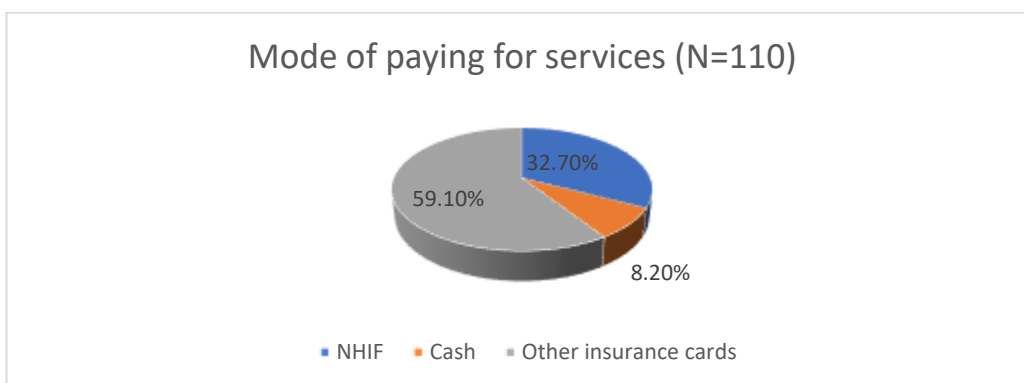


Figure: 4.13: Mode of Payment Used by Study Participants to Cater for the Health Services Offered

4.4.2 Association between Socio-Economic Factors and Self-Care Practices

Socio-economic factors were analyzed to check for significant factors influencing self-care practices among the study participants. Chi-square/fisher exact test was conducted to assess the association between socio-economic factors and self-care practice. Source

of psychological support (X^2 value=8.415, $P=0.015$, $df=2$), source of spiritual support (X^2 value=13.195, $P=0.001$, $df=2$), frequency of guidance and counseling (fisher exact test=22.72, $P<0.001$, $df=3$), frequency of participating in social activities (X^2 value=6.497, $P=0.039$, $df=2$), frequency of receiving material support (X^2 value=20.65, $P<0.001$, $df=3$), net income (fisher exact test=18.89, $P<0.001$, $df=2$), mode of paying for services (X^2 value=34.3, $P<0.001$, $df=2$), land size (X^2 value=7.31, $P=0.026$, $df=2$), level of education (fisher exact test=11.54, $P=0.014$, $df=4$), and employment status (X^2 value=6.77, $P=0.034$, $df=2$) were significantly associated with self-care practices (Table 4.5).

Table 4.5: Chi-Square/Fisher Exact Test of Association between Socio-Economic Factors and Self-Care Practices

Variable	Category	Level of self-care practice		Chi-square value, Fisher exact test, df, P value
		Poor	good	
Source of psychological support	Family	23	14	X^2 value=8.415 $P=0.015$ $df=2$
	Friends	17	3	
	Hospital staff	46	7	
Source of spiritual support	Reading the bible	17	6	X^2 value=13.195 $P=0.001$ $df=2$
	Prayed for by family	61	9	
	Prayed for by church	8	9	
Frequency of guidance and counseling	Weekly	33	11	Fisher exact test =22.72 $P<0.001$ $df=3$
	Monthly at the clinic	41	4	
	Rarely	9	0	
	Occasionally	3	9	
Frequency of participating in fellowship with family and friends	Daily	77	24	X^2 value=2.74 $P=0.098$ $df=1$
	Fourth nightly	9	0	
Frequency of participating in social activities	Daily	31	4	X^2 value=6.497 $P=0.039$ $df=2$
	Weekly	21	12	
	Once a month	34	8	
	Daily from family	29	3	
Frequency of receiving material support	Weekly	4	8	X^2 value=20.65 $P<0.001$ $df=3$
	Fourth nightly	21	9	
	Once a month	32	4	
Frequency of physical support in daily chores	Daily from family	74	24	X^2 value=3.75 $P=0.053$ $df=1$
	Weekly	12	0	
Net income	10000-15000	6	4	Fisher exact test =18.89 $P<0.001$ $df=2$
	15000-20000	3	8	
	>20000	77	12	
Mode of paying for services	NHIF	17	19	X^2 value=34.31 $P<0.001$
	Cash	6	3	

Variable	Category	Level of self-care practice		Chi-square value, Fisher exact test, df, P value
		Poor	good	
Land size	Other insurance cards	63	2	df=2
	5-10 Ha	22	11	X^2 value=7.31
	10-15 Ha	24	9	P=0.026
Use of the land	>15 Ha	40	4	df=2
	Crop farming	28	14	Fisher exact test=6.97
	Animal farming	46	10	P=0.024
Level of education	Leased the land	12	0	df=2
	Informal	8	4	Fisher exact test=11.54
	Primary	7	2	P=0.014
	Secondary	12	9	df=4
	Diploma	31	2	
Employment status	Post diploma	28	7	
	Employed	49	8	X^2 value=6.77
	Farmer	7	6	P=0.034
	Business	30	10	df=2

4.4.3 Binary Logistic Regression for Socio-Economic Factors and Self Care Practices

The socio-economic factors that were significant after chi-square/fisher exact test were entered into binary logistic regression and the summary of the findings was presented in table 4.6.

Study participants who reported that their source of psychological support was family were 4 times more likely to perform self-care practices compared to those who reported hospital/clinic (COR= 4; 95% CI =1.419-11.274; **P=0.009**). Study participants who reported that their source of spiritual support was being prayed for by family were 87% less likely to perform self-care practices compared to those who reported being prayed for by church (COR= 0.131; 95% CI =0.040-0.428; **P=0.001**). Study participants who reported that their frequency of guidance and counseling was weekly and monthly were 89% and 97% less likely to perform self-care practices compared to those who reported occasionally (COR= 0.111; 95% CI =0.025-0.485; **P=0.003** and COR= 0.033; 95% CI =0.006-0.171; **P=>0.001**) respectively. Study participants who reported that their frequency of receiving material support was weekly were 16 times more likely to perform self-care practices compared to those who reported monthly (COR= 16.0; 95% CI =3.27-78.28; **P=0.001**). Study participants who reported that their net income was Ksh **10000-15000** and 15,000-20,000 were 4.3 and 17.11 times more likely to perform self-care practices compared to those who

reported >20,000 (COR= 4.278; 95% CI =1.051-17.41; P=**0.042** and COR= 17.11; 95% CI =3.975-73.65; P=<**0.001**) respectively. Study participants who reported that their approximate land acreage size was 5-10 and 10-15 Ha were 5 and 3.75 times more likely to perform self-care practices compared to those who reported >15Ha (COR= 5.00; 95% CI =1.422-17.576; P=**0.012** and COR= 3.75; 95% CI =1.041-13.513; P=**0.043**) respectively. Study participants who reported that their mode of paying for hospital services was NHIF and cash were 35.21 and 15.75 times more likely to perform self-care practices compared to those who reported other insurance cards (COR=35.21; 95% CI =7.455-166.26; P=<**0.001** and COR=15.75; 95% CI =2.184-113.55; P=**0.006**) respectively (Table 4.6).

Table 4.6: Binary Logistic Regression of Association between Socio-Economic Factors and Self-Care Practices

Category	B	df	COR	95% CI for OR		P value
				Lower	Upper	
Level of education						
Informal	0.693	1	2.000	0.465	8.597	0.352
Primary	0.134	1	1.143	0.193	6.752	0.883
Secondary	1.099	1	3	0.906	9.931	0.072
Diploma	-1.355	1	0.258	0.049	1.347	0.108
Post diploma			Ref			
Employment status						
Employed	-0.714	1	0.490	0.174	1.379	0.176
Farmer	0.944	1	2.571	0.698	9.476	0.156
Business			Ref			
Source of psychological support						
Family	1.386	1	4	1.419	11.274	0.009
Friends	0.148	1	1.160		5.006	0.843
Hospital/ Clinic			Ref			
Net income						
10000-15000	1.453	1	4.278	1.051	17.41	0.042
15000-20000	2.840	1	17.11	3.975	73.65	<0.001
>20000			Ref			

Category	B	df	COR	95% CI for OR		P value
				Lower	Upper	
Approximate land acreage size						
5-10 Ha	1.609	1	5.00	1.422	17.576	0.012
10-15 Ha	1.322	1	3.75	1.041	13.513	0.043
>15 Ha	Ref					
Land use						
Crop farming	20.51	1	42.1	0.000		0.999
Animal farming	19.67		31.3	0.000		0.999
Leased	Ref					
Mode of paying for hospital services						
NHIF	3.561	1	35.21	7.455	166.26	<0.001
Cash	2.757	1	15.75	2.184	113.55	0.006
Other insurance cards	Ref					
Source of spiritual support						
Read the bible	-1.159	1	0.314	0.083	1.183	0.088
Prayed for by family	-2.031	1	0.131	0.040	0.428	0.001
Prayed for by church	Ref					
Frequency of guidance and counseling						
Weekly	-2.197	1	0.111	0.025	0.485	0.003
Monthly at the clinic	-3.426	1	0.033	0.006	0.171	>0.001
Rarely	-22.302	1	0.000	0.000		0.999
Occasionally	Ref					
Frequency of participating in social activities						
Daily	-0.601	1	0.548	0.150	2.002	0.363
Weekly	0.887	1	2.429	0.852	6.919	0.097
Monthly	Ref					
Frequency of receiving material support						
Daily	-.189	1	0.828	0.171	4.014	0.814
Weekly	2.773	1	16.00	3.27	78.28	0.001
Fortnightly	1.232	1	3.429	0.934	12.581	0.063
Monthly	Ref					

4.4.4 Multivariate Regression between Socio-Economic Factors and Self Care practices

The socio-economic factors that were significant after binary logistic regression were entered into multivariate regression model, and the summary of the findings were presented in table 4.7. None of the socio-economic factors were significantly associated with self-care practices (Table 4.7).

Table 4.7: Multivariate Analysis of Factors Affecting Self-Care Practices among The Study Participants

Variable	B	df	AOR	95% CI for AOR		P Value
				Lower	Upper	
Source of Psychological support						
Family	35.167	1	35.00	0.000	.	0.995
Friends	51.796	1	70.00	0.000	.	0.994
Hospital/ Clinic	Ref					
Source of spiritual support						
I read the bible	-96.73	1	0.000	0.000		0.998
Prayed for by family	-36.39	1	0.000	0.000		0.997
Prayed for by church	Ref					
Frequency of guidance and counseling						
Weekly	-147.7	1	0.000	0.000		0.999
Monthly at the clinic	-99.35	1	0.000	0.000		0.998
Monthly at the clinic	-157.8	1	0.000	0.000		0.996
Occasionally	Ref					
Frequency of receiving material support						
Daily	50.651	1	40.00	0.000		0.998
Weekly	48.728	1	20.0	0.000		0.999
Fortnightly	-15.6	1	.000	0.000		1.000
Monthly	Ref					
Net income for participant						
Kshs. 10000-15000	39.036	1	24.000	0.000		0.999
Kshs. 15000-20000	19.929	1	56.902	0.000		0.998
Kshs. >20000	Ref					
Approximate land acreage size						
5-10 Ha	-14.46	1	0.000	0.000		1.000
10-15 Ha	-3.434	1	0.032	0.000		1.000
>15 Ha	Ref					
Mode of paying for services						
NHIF	36.164	1	12.000	0.000		0.997
Cash	55.950	1	50.00	0.000		0.997
Other insurance cards	Ref					

CHAPTER FIVE

DISCUSSION, CONCLUSION AND RECOMMENDATION

5.1 Discussion

5.1.1 Level of Self-Care Practices among the Study Participants

The study found out that majority of the study participants 31.8%, (n=35) were unable to consume a balanced diet for more than three days a week with 16.4% failing to afford a balanced diet at all in a whole week. More so the choice of high fat diet that was taken by 35% of the study participants showed how inappropriate dietary practice was among the study participants. Diet is key in managing T2DM and therefore, it's detrimental to fail to comply to the recommended diet. In Nigeria, Dwa and Panthee (2021) assessed the level of self-care practices and reported the rate of compliance to recommended diet to be at 18.6%. This indicates that in African countries, there is a tendency of the patients not to comply to recommended diet. This was also supported by findings reported by (Ugwu *et al.*, 2020) in another study done in Southern Nigeria, which indicated low level of compliance to recommended diet. This implies that ability to consume a balanced dietary plan negates the efforts of self practice to diabetes care.

The study participants reported not to be exercising; they assumed that doing the daily chores was part of the exercise. In managing T2DM, the patients were expected to exercise for at least 30 minutes daily (Beck, *et al.*, 2018). Therefore, the study participants in the current study had poor practice on exercise. These findings concurred with a study done in Ethiopia, which indicated non-adherence to recommended exercise schedule among the patients with T2DM (Abate, *et al.*, 2018). The study participants reported that they were usually busy working for daily bread and considered that as part of the exercise. Those who tried to exercise did it once in a week. In India, the study participants were reported to be doing daily physical workouts and exercise and this led to higher level of self-care practices (Chinnappan, *et al.*, 2020). The meaning of exercising among the participants seems not standardized, it appears that the engagement of activities at home are interpreted as adequate exercise even though not quantified. These findings may have been influenced by high level of patients' empowerment on self-care practices.

Blood glucose monitoring was also recommended in managing diabetes mellitus (Beck, *et al.*, 2018). In the current study, the study participants (53.6%, n=59) were able to monitor their glucose levels at least once a week while the rest were monitored only when attending the diabetic clinics. This contributed to low levels of self-care practices among the study participants. A study done in Tamil Nadu, indicated that patients with T2DM were not able to monitor their glucose levels daily as recommended due to inability to purchase glucometer and gluco-sticks (Azami, *et al.*, 2018). Blood glucose monitoring is a core self-care practice that should be enabled for diabetic patients. Inability to access or conduct self-assessment of blood sugar levels may contribute to wanting self - care practice and consequently to diabetic complications since the patient is not able to formatively evaluate their blood sugar status at their convenience.

Majority of the study participants (48.2%, n=53) only inspected their feet once a week. These findings were in line with a study conducted in Gamo Gofa Zone (Agidew, *et al.*, 2021). In Gamo, the patients with T2DM had poor practice of inspecting their feet. A study done in Saudi Arabia found that patients with T2DM rarely inspected their shoes (Alotaibi & Bandar, 2020). Majority of the participants reported not to be Cigarette smokers. A few reported to have Cigarette smoked daily or skipping a day in a week. This was associated with poor self-care practice. These findings were similarly reported in Nigeria, where diabetic patients with poor self-care practices were found to be smoking for more than five days a week (Adisa, *et al.*, 2017). In general, the study found patients with T2DM had poor level of self-care practices and this was also reported in other studies conducted in African countries (Agidew, *et al.*, 2021; Abate, *et al.*, 2018; Essien, *et al.*, 2017). Cigarette smoking is a lifestyle practice that is documented risk factor to developing diabetes. Liberal lifestyle of the Cigarette smokers could probably explain the reason why the poor selfcare practice is demonstrated among Cigarette smokers.

5.1.2 Association between the Level of Knowledge and Self-Care Practices of The Study Participants

The knowledge level of the study participants on self-care practices was found to be poor at 60% and the remaining had moderate level of knowledge. There was no statistical significance in the association of level of knowledge and self-care practice of study participant. ($p=0.258$). This showed that there were other factors which contributed to the low levels of selfcare practices which includes; low stress coping mechanism, low financial status and poor psychosocial support to the T2DM patients. These results were congruent with studies done in Nigeria, Ghana, Ethiopia and Thika in Kenya respectively (Aquino, *et al.*, 2018; Chali, *et al.*, 2018; Mogre, *et al.*, 2017). Patients with T2DM showed knowledge deficit on diet and self- monitoring of blood sugar levels (Lee *et al.* 2019).

The level of knowledge among patients with T2DM from Kuwait was higher (Beck, *et al.*, 2018). However, the study findings differed with a research done in India which revealed that patients with T2DM had higher level of knowledge and this led to improved self-care practices (Tiruneh, *et al.*, 2019). Similarly, a study done by Ojobi, *et al.*, (2017) demonstrated that awareness of the disease played a role in improving self-care behaviors for those persons living with T2DM. Literate patients with T2DM were more likely to monitor their disease progression and adhere to medication compared to those who were illiterate (Ojobi ,*et al.*,2017). From the findings having knowledge on self- care practice does not translate to the actual self- care practice probably due to the emphasis on the passing information theoretically without applying practical demonstrations of how to perform the self -care activities.

A study done by Mogre, *et al.*, (2017), showed that patients with T2DM with higher level of knowledge on diabetes were more likely to adhere to the laid self-care practices compared to their counter parts. More education was associated with higher level of knowledge and self-care practice. Another study done by Essien *et al.*, (2017), indicated that those with higher level of education and more than 3 years with T2DM had higher level of knowledge on diabetes (Essien, *et al.*, 2017).

5.1.3 Socio-Economic Factors Influencing Self-Care Practices among the Study Participants

The study assessed various socio-economic factors and found source of psychological support, source of spiritual support, net income of the participant and mode of paying for services were significant factors influencing self-care practices after binary logistic regression. The study participants who received psychological and spiritual support performed self-care practices compared to their counterparts. Similarly, a study done in Nigeria found that social support (psychological and spiritual support) was significantly associated with self-care practices (Adisa *et al.*, 2017). A study done by Aquino *et al.*, (2018) revealed that availing aid to patients with T2DM enhanced their ability to practice self-care behaviors. (Lee, *et al.*, 2019) argued that members of the family were considered important source of social support to patients with T2DM. When patients with T2DM received psychological and spiritual support from family and friends, they feel encouraged and motivated to perform self-care practices.

Study participants who reported that their net income was good performed self-care practices compared to their counterparts. Lee *et al.* (2019) indicated that limited income led to reduced access of hospital services and information which affected self-care practices among patients with T2DM. These results were echoed by (Cho, *et al.*, 2018), whose findings showed that lack of employment denied patients with T2DM from seeking subsequent treatment due to lack of income. For land acreage the land size did not have a significant association with self-care practice this disagrees with a study done by (Mokaya, *et al.*, 2022) who found out that subsistence farming was an enabler to a healthy diet among T2DM patients.

The study participants who were using NHIF card for paying services in the hospital performed self-care practices compared to their counterparts. Those paying by cash found the services to be expensive and unaffordable. These findings were in agreement with those found in Nigeria, which indicated that the patients with T2DM paying using NHIF card performed self-care practices compared to those paying in cash (Adisa *et al.*, 2017).

5.2 Conclusion

Following the study findings, it was concluded that the study participants who participated in the study had poor knowledge on self-care practices and low level of self-care practices. There was no significant relationship between level of knowledge and self-care practices. Source of psychological support, source of spiritual support, net income of the participant and mode of paying for services were found to be significant factors influencing self-care practices.

5.3 Recommendations

The study made the following recommendations based on the findings

1. The Ministry of Health (MoH) under the Kenyan Government should involve the county governments to intensify on the sensitization of the recommended diabetic self-care practices under Non - Communicable Diseases to promote good health to her population.
2. Building diabetic patients' knowledge and developing their skills by strengthening and disseminating health education programs and Information, Education Materials (IEC) at each follow-up visit to enable them to comply with and maintain recommended self-care practices.
3. Community awareness programs should also be enhanced to increase knowledge about diabetes self-care practices among general population.
4. Empower the patients financially to increase their net monthly income by participating in various income generating activities
5. Encourage patients use of insurance funds as mode of payment of health services

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APPENDICES

Appendix I: Informed Consent

My name is Annah Nduku Musyoka, HSN 311-1144/2020 a student at Jomo Kenyatta University of applied sciences doing a study on factors influencing self-care behaviors for persons suffering from T2DM and visiting Kibwezi sub-County. You are kindly asked to generously and truthfully participate in this research process.

Purpose of the study: The objective of this research is to determine variables having an impact on self-care management for persons living with T2DM and visiting Kibwezi sub-County hospital. This will help in managing the diabetes and improving the quality of life of the patients and prevent them from developing complications related to poor management of diabetes.

Confidentiality: Participants' information will be secured. Therefore, such data will only be used for study purposes. Anonymity will be used whereby the participant will not indicate the name in the questionnaire.

Voluntary participation and Withdrawal: Participants will be at liberty to either participate or not participate and one can withdraw turn down my participation from the research without any consequences.

Benefits: The outcome of the study will help in promoting self-care for persons living with T2DM.

Risks: There are no risks of physical or psychological harm involved in the study.

Contact Person

With comprehensive knowledge of the terms and conditions availed by the researcher, that participation is voluntary, guaranteed anonymity and security of information given, I accept to take part in the research.

Signature _____

Date _____

Investigator signature _____

Date _____

Appendix II: Questionnaire

Instructions

You are required to mark [$\sqrt{\quad}$] correctly and in the availed spaces fill in correct data.

SECTION A: SOCIO-DEMOGRAPHIC CHARACTERISTICS

1. Age of the respondent in years.....?
2. What is your gender?
 - i) Female []
 - ii) Male []
3. Marital Status?
 - i) Single []
 - ii) Married []
 - iii) Divorced []
 - iv) Widowed []
4. What is your level of education attained?
 - a) Received informal education alone []
 - b) Primary level []
 - c) High school level []
 - d) Diploma level []
 - e) Post diploma level []
5. Which religion do you take part?
 - a) Muslim []
 - b) Christian []
6. What is your employment?
 - a) Employed []
 - b) Unemployed []
 - c) Self-employed []

SECTION B. DIABETIC KNOWLEDGE TEST

1. Diet recommended by the person with T2DM is:
 - a. American's way of eating
 - b. A recommended healthy style of eating**
 - c. Lots of carbohydrates and chunk food
 - d. Lots of meat and other protein foods
2. OF the following list of foods, which one has the highest carbohydrates?
 - a. Beans
 - b. Pork
 - c. Bread**
 - d. Banana
3. Select the food with the highest content of fat?
 - a. Low fat (2%) milk**
 - b. Guava
 - c. Beans
 - d. Kales
4. Select the type of food considered to be "free food"?
 - a. Any sugarless food
 - b. Foods labeled to have zero fat content
 - c. Foods labeled sugar free
 - d. Foods with at most 20 calories per meal**
5. A1C an estimate of your mean blood glucose level for the past:
 - a. month
 - b. Fortnight
 - c. 6-12 weeks**
 - d. One year
6. Select the ideal method for testing glucose particularly at home?
 - a. Measuring body temperatures
 - b. Screening blood**
 - c. None of the above is correct
7. State the particular impact that unsweetened juice imposes on blood glucose?
 - a. Moderates it

- b. Increases it
 - c. None of the above
8. Select practice not recommended to heal low blood glucose?
- a. 3 hard candies
 - b. 1/2 cup orange juice
 - c. A 300 ml of coke
 - d. Two cups of milk
9. State the impact that physical exercise has on blood glucose?
- a. Decreases it
 - b. Increases it
 - c. None of the above
10. State the impact that body infections have on blood glucose?
- a. Reduces blood glucose
 - b. Increases blood glucose
 - c. None of the above
11. The best way of maintaining your feet is:
- a. Examines them and clean them with clean water on a daily basis.
 - b. Use detergents like alcohol to do massage on the foot
 - c. Put them in water for at least an hour daily
 - d. Purchase unusually large shoes
12. Taking foods with lower content of fat has the following effect:
- a. Headaches
 - b. Liver disease
 - c. Heart illness
 - d. Nose disease
13. Some symptoms like tingling and numbness may be an indication of which illness:
- a. Headaches
 - b. Nerve illness
 - c. Ear illness
 - d. Kidney illness
14. Diabetes is usually not related to;

- a. Blindness
 - b. Kidney complications
 - c. Nerve complications
 - d. Ear complications
15. Ketoacidosis (DKA) is associated with which symptom
- a. Shivering
 - b. Sweating a lot
 - c. Diarrhea
 - d. Declined blood glucose
16. Individuals suffering from flu are recommended to:
- a. Avoid taking insulin
 - b. Totally avoid sugary drinks
 - c. Takes a lot of meat
 - d. Does blood glucose screening frequently.
17. Taking rapid-acting insulin decrease blood glucose reaction particularly in:
- a. At-most 120 minutes.
 - b. One day
 - c. Half a day
 - d. One week
18. Skipping taking insulin during breakfast hour can be rectified through?
- a. Avoiding taking lunch meal as well
 - b. Immediately takes the insulin that you should have taken during breakfast
 - c. Double the amount of insulin that you take
 - d. First screen you blood glucose level and then make a decision on the amount of insulin you should take
19. Low blood glucose can be rectified through:
- a. Carrying out physical exercises
 - b. Taking a rest
 - c. Taking an initiative of taking juice
 - d. Eating more fatty food
20. Declined blood glucose reaction comes as a result of:
- a. Excessive insulin

- b. No insulin intake at all
 - c. Taking little amount of meal
 - d. Drinking orange juice
21. Taking morning insulin and avoid breakfast meal will have which effect on blood glucose level:
- a. Raises it
 - b. Lowers it**
 - c. None of the above
22. An increased blood glucose comes as a result of:
- a. Excess insulin**
 - b. Avoiding taking breakfast
 - c. Taking more fruits
 - d. Doing intensive exercises
23. A declined blood glucose comes as a result of:
- a. Heavy exercise**
 - b. Taking lot of proteins
 - c. Eating a lot
 - d. Avoiding taking insulin

SECTION C: SOCIAL AND ECONOMIC SUPPORT.

Emotional

1. What is type of psychological support did you require in the past month? (e.g., solace
..... (Gotten from Family, friends or hospital clinic)
2. To what frequency did you require spiritual support in the past month? (e.g., prayers, assistant from spiritual leader, etc..... (Reading the bible, Prayer for by the family or Prayed by the church)
3. To what frequency did you require guidance and counselling in the past month? (e.g., from family, friends, etc.)
.....(weekly, monthly, Rarely or occasionally)

Interpersonal

4. What is the frequency did you require fellowship from other persons in the past month? (e.g., friends, partner,).....
5. How much days did you need to take part in social activities in the past month? (e.g., movies, sports events, clubs, etc.) (Daily, weekly or Monthly)

Material

6. What duration of days did you require material support in the past month? (e.g., financial support etc.) (Daily, weekly, Fortnightly or monthly)
7. What duration of days did you need aid in doing your task or working in the past month? (e.g., homework, school homework, etc.)
.....

ECONOMIC DETERMINANTS.

1. What is your employment position?

- b) Employed []
- c) Unemployed []
- d) Self-employed []

2. What is your net income status?
 - a) From 10,001-15,000 Shillings
 - b) From 15,001-20,000 Shillings
 - c) From 20,000 shillings and above
3. What is the approximate size of your land property?
 - a) 5-10 hectares
 - b) 10-15 hectares
 - c) Above 15 hectares
4. How is your land property used for?.....(crop farming, Animal farming or Leasing)
5. Do you have any active Health Insurance? If any, name it and its areas of health coverage..... (NHIF. Cash payment or other insurance cards)

SECTION D: SUMMARY OF DIABETIC SELF-CARE ACTIVITIES (SDSCA) ANSWER IN DAYS PER 1 WEEK (0-7 DAYS)

1. For the last one week for how long have you taken recommended balanced diet as per doctors advise?
2. Generally, for how long on a weekly basis per week do you stick you the recommended eating schedule?
3. For the last one week how many days have you taken your meals at five or took more of vegetables and fruits.?
4. For the last one week, for how long did you eat foods high with fat for instance red meat or dairy products full of fat?
5. For the last one week, for how long did you took part in at least half an hour physical exercise?
6. For the last one week, how many days did you took part in in particular physical workouts such us jogging other than the normal activities that you do around the house?
.....
7. How many days did you do a screening of your blood pressure for the past one week? (0-7 Days)

8. For the last one week, blood screening took place for how many days in accordance with the number of days advised by your doctor?.....(0-7 Days).
9. For the last one week, what number of days did you inspect your feet? (0-7 Days)
10. For the last one week, for how long do an inspection in your shoes? (0-7 Days)
11. For the last one week, have you ever tested cigarette be it taking even one puff?..... (0-7 Days)

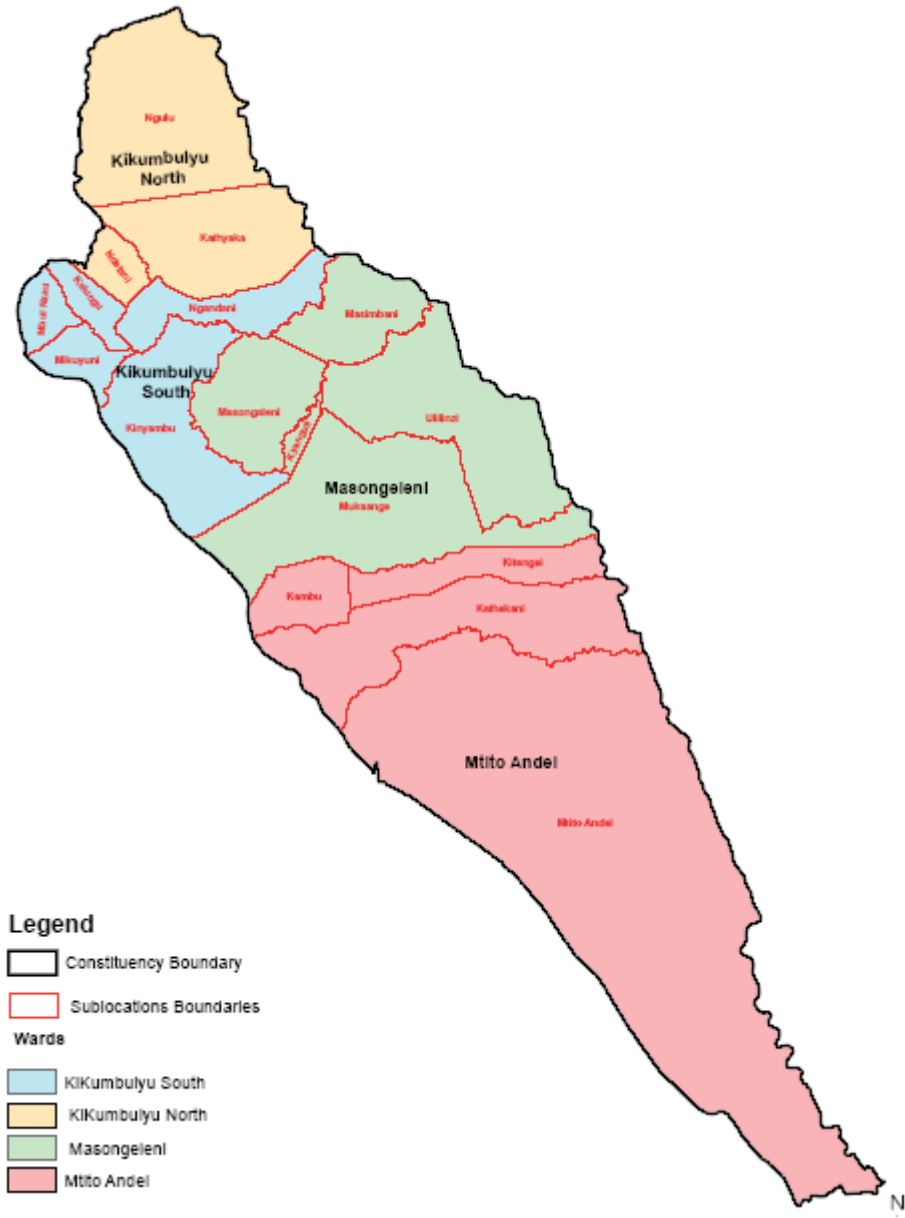
Appendix III: Study Work Plan

Activity	MA Y 2021	JUN E 2021	JUL Y 2021	FEB 202 2	MARC H 2022	JUNE -NOV 2022	JAN - DE C 2023	JAN- SEP T 2024
Problem Identification								
Proposal writing and presentation								
Proposal ethics review								
Tool pre-testing								
Collection of data								
Data analysis								
Project writing and presentation								
Final document submission								

Appendix IV: Study Budget Estimates

ITEM	QUANTITY NEEDED	PRICE EACH (KSHS)	OF ITEM	SUMMATION OF COST (KSHS)
Stationery and Printing papers	_____	20,000		20,000
Printing and other computer services	_____	25,000		25,000
Research assistant fee	1	2000X30 days		60,000
Travelling expenses	_____	25,000		25,000
Data analysis fee	_____	20,000		20,000
HP Laptop	1	50,000		50,000
Grand total	_____	_____		200,000

Appendix V: KIBWEZI EAST MAP



Appendix VI: Ethics Review Committee Approval Letter



OFFICE OF THE CHAIRPERSON
INSTITUTIONAL SCIENTIFIC ETHICS REVIEW COMMITTEE
UNIVERSITY OF EASTERN AFRICA, BARATON
P.O. BOX 2500-30100, Eldoret, Kenya, East Africa

B2422112022

November 22, 2022

TO: Annah Nduku Musyoka
School of Nursing
Jomo Kenyatta University of Agriculture and Technology

Dear Annah,

RE: Self-Care Practices and Its Associated Determinants Among Adult Clients With Type 2 Diabetes Mellitus in Kibwezi East Sub-County, Makueni County.

This is to inform you that the Institutional Scientific Ethics Review Committee (ISERC) of the University of Eastern Africa Baraton has reviewed and approved your above research proposal. Your application approval number is UEAB/ISERC/24/11/2022. The approval period from is November 2nd, 2022 – November 22nd, 2023.

This approval is subject to compliance with the following requirements;

- i. Only approved documents including (informed consents, study instruments, MTA) will be used.
- ii. All changes including (amendments, deviations, and violations) are submitted for review and approval by the Institutional Scientific Ethics Review Committee (ISERC) of the University of Eastern Africa Baraton.
- iii. Death and life-threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to the Institutional Scientific Ethics Review Committee (ISERC) of the University of Eastern Africa Baraton within 72 hours of notification.
- iv. Any changes, anticipated or otherwise that may increase the risks or affected the safety or welfare of study participants and others, or affect the integrity of the research must be reported to the Institutional Scientific Ethics Review Committee (ISERC) of the University of Eastern Africa Baraton within 72 hours.
- v. Clearance for export of biological specimens must be obtained from relevant institutions.
- vi. Submission of a request for renewal of approval at least 60 days prior to the expiry of the approval period. Attach a comprehensive progress report to support the renewal.
- vii. Submission of an executive summary report within 90 days upon completion of the study to the Institutional Scientific Ethics Review Committee (ISERC) of the University of Eastern Africa Baraton.

Prior to commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology, and Innovation (NACOSTI) <https://oris.nacosti.go.ke> and also obtain other clearances needed.

Sincerely yours,


Prof. Jackie K. Obey, PhD

Chairperson, Institutional Scientific Ethics Review Committee



A SEVENTH-DAY ADVENTIST INSTITUTIONAL SCIENTIFIC ETHICS REVIEW COMMITTEE
CHARTERED 1991

Appendix VII: Nacosti Permit



REPUBLIC OF KENYA



NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION

Ref No: 667862
Date of Issue: 09/December/2022

RESEARCH LICENSE



This is to Certify that Ms. ANNAH NDUKU MUSYOKA of Jomo Kenyatta University of Agriculture and Technology, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Makueni on the topic: SELF CARE PRACTICES AND ITS ASSOCIATED DETERMINANTS AMONG ADULT CLIENTS WITH TYPE 2 DIABETES MELLITUS IN KIBWEZI EAST SUB- COUNTY , MAKUENTI COUNTY for the period ending : 09/December/2023.

License No: NACOSTIP/22/22551

667862

Applicant Identification Number



Director General
NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION

Verification QR Code



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See overleaf for conditions