FACTORS ASSOCIATED WITH ADHERENCE TO LIFESTYLE MODIFICATIONS AMONG TYPE 2 DIABETIC PATIENTS ATTENDING KIWOKO HOSPITAL

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DECLARATION

I Nassuna Grace, declare that this dissertation entitled “factors associated with adherence to lifestyle modifications among type two diabetic patients attending Kiwoko hospital Nakaseke District , Uganda” is my own work and has never been presented to any institution for any award

Signature ……

Date …..……....

APPROVAL

I confirm that this report entitled “factors associated with adherence to lifestyle modifications among type 2 diabetic patients attending Kiwoko hospital Nakaseke district Uganda” by Nassuna Grace was done under my supervision.

Signature ……

ALIMAH KOMUHANGI

SUPERVISOR

Date ……....

DEDICATION

I dedicate this dissertation to my dad and my late mother.

You groomed me into the woman I am today. I pray that the almighty rewards you abundantly.

ACKNOWLEDGEMENT

First and foremost, I thank the almighty God who has seen me through the journey and given me courage, determination and strength to carry on.

I appreciate the contribution of a number of people who have played a big role in helping me with this dissertation. First and foremost, appreciation goes to my supervisor, Mrs. Oleko Alimah Komuhangi for the guidance, professional supervision and critique during the period of writing this dissertation.

I also thank the management of Kiwoko Hospital and the diabetes patients who attend the diabetes clinic at Kiwoko Hospital for the support offered. Your contribution to this study is highly appreciated.

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ABSTRACT

Introduction: The reduction in the incidence of diabetes is directly associated with change in lifestyle. Adherence to lifestyle modifications is a problem common with type 2 diabetic patients. According to International Diabetic Federation, of which Uganda is a member country, there are 400,600 people in Uganda registered with Diabetes Mellitus. The focus of the government in advancing free medical care and other support systems in Uganda has attained less success. The rising challenge of the condition remains a threat to the livelihood of the people

Objectives: The aim of the study was to determine the factors associated with adherence to lifestyle modifications among type 2 diabetic patients attending Kiwoko hospital. The specific objectives were; to assess the individual factors, socio-economic factors and DM related complications associated with adherence to lifestyle modifications among type 2 diabetic patients attending Kiwoko hospital.

Methodology: A cross-sectional study was conducted among 96 diabetes type 2 patients attending Kiwoko hospital in the period of June 2017. Data was collected using a researcher administered questionnaire from randomly selected patients and analyzed using SPSS were chi-square tests were conducted to determine the associations.

Results: The proportion of patients that adhered to type 11 diabetes mellitus lifestyle modifications was 39.6%. Majority of the respondents had knowledge about lifestyle modifications and positive attitude towards adherence. The most practiced modifications were; dietary modifications (89.6%), attendance of DM clinics (89.6%) and abstinence from abuse of substances (84.4%). Two thirds of the respondents (45.8%) had emergency visits to the hospital due to uncontrolled sugar levels. Age (P=0.000), average monthly income (P=0.000), uncontrolled sugar levels (P=0.006) and damage to the eyes and nerves due to DM (P=0.000) had significant association with adherence to lifestyle modifications.

Conclusion and recommendation: Low adherence to life style modifications among people with type 11 diabetes in Nakaseke District is significantly associated with, age, religion and income status. Dietary modifications, regular monitoring of blood sugar levels, self-care behavior and abstinence from substance abuse are significantly associated complications such as diabetic foot uncontrolled sugar levels and damage to eyes and nerves. A multi-disciplinary approach should be used to increase adherence to life style modifications for type 11 diabetes.

CHAPTER ONE: INTRODUCTION

1.0 Introduction

Diabetes type 2 is a non- communicable disease with no cure but with effective management and life style modifications the diseases can be controlled. This chapter describes the background to the study, the problem statement, objectives, research questions, justification of the study and the conceptual framework that was adopted for study.

1.1 Background to the study

Globally, 382 million people have type 2 diabetes and it is estimated to rise to 592 million by 2035 (IDF, 2013). The burden of type II diabetes mellitus is becoming an epidemic and is a cause of morbidity and mortality, especially in the developing world (ADA, 2013).

Diabetes Mellitus type 2 accounts for 90–95% of those with diabetes. It has been previously referred to as non-insulin-dependent diabetes or adult-onset diabetes (ADA, 2009). The body of a person with diabetes type 2 does not use insulin properly (ADA, 2016). Despite the fact that the pancreas makes extra insulin to make up for it but over time it is not able to keep up and unable to make enough insulin to keep blood glucose at normal levels (ADA, 2016). As a result, the disease may be diagnosed several years after onset, once complications have already arisen (WHO, 2013).

Until recently, this type of diabetes was seen only in adults but it is now also occurring increasingly frequently in young people (WHO, 2013). Symptoms include; increased thirst, unexplained weight loss, frequent micuration. Complications such as; Diabetic retinopathy, kidney failure, blindness and poor flow of blood to the limbs (WHO, 2016).

The occurrence of diabetes mellitus Type II results from obesity, inadequate exercise and genetic predisposition. The condition has higher chances of occurrence compared to other types such as type 1 and gestational diabetes. In type 1, the patients entirely lack insulin resulting from the breakdown of islet cells found in the pancreas (Shoback et al., 2011).

The diagnosis of any type of diabetes is done through blood tests such as oral glucose tolerance test and fasting plasma glucose. Prevention and management of diabetes type 2 prove possible through lifestyle modifications. Management of one's weight accompanied with proper feeding and regular exercises reduce risks of suffering this condition and eases its effects on those affected. Any form of treatment recommended for patients involves dietary

changes and exercises that prove management through lifestyle management (Najjar et al., 2015).

In India, a study involving 207 diabetic patients revealed that 83.3% of participants had poor knowledge of lifestyle modification as a non-pharmacologic treatment for diabetes mellitus. (Malathy et al., 2011).

In sub-Saharan Africa, due to rapid uncontrolled urbanization and major changes in lifestyle, the prevalence and burden of Diabetes Mellitus type II is rising quickly (Mbanya et al., 2010). It is among the major Non Communicable Diseases (NCDs) posing global threat to human health and productivity in the 21st century (ADA, 2013). DM type II is one of the NCDs that is hindering the health of the people globally (Hilawe et al., 2013).

In Africa, the prevalence of people living with type II Diabetes Mellitus was 20 million in 2013 and is projected to go through a two-fold increase by 2035 (IDF, 2013). Where as lifestyle modification is vital in the management of diabetes mellitus type 2, there are hardly any studies on the knowledge, attitude and practice of lifestyle modification, specifically with regard to type II Diabetes Mellitus and this is complicated by varied results from various settings.

In South Africa, a cross-sectional study in reported that no respondents had knowledge, 92.6% had scanty knowledge of the benefits of weight loss, healthy diet and exercises (Ikombele., 2011). Majority of the respondents.97,7% had bad practices in relation to lifestyle modifications (regular physical activity, weight loss and dietry changes that include eating food with high amount of fibre) (Ikombele et al., 2011). Never the less, 84.3% had positive attitudes towards lifestyle modifications (Ikombele et al., 2011). Furthermore, in Kenya, a study involving 1982 diabetic patients was conducted, 28% of the participants had a good attitude toward lifestyle modification; 75% had poor dietary practice; and 72% did not exercise regularly (Kiberenge et al., 2010).

In Uganda, there were 400,600 cases of diabetes (both type I and type II) in the year 2015 (IDF., 2015). A research carried out in Iganga District showed that diabetes was perceived to be a very severe disease (Mayege et al., 2014). The severity of Diabetes Mellitus was attributed to its incurability and its numerous health effects (Mayege et al., 2014). Men were also concerned about reduced sexual performance (Mayege et al., 2014). However, participants' strong concerns about the severity of diabetes were not reflected in their

perceptions about the risk factors and lifestyles associated with it (Mayega et al., 2014). According to the international diabetes federation, 415 million people around the world suffer from diabetes. Among these; 14 million live in Africa region with 400600 registered in Uganda as of 2016 statistics.

According to the statistics above, diabetes mellitus is on a rise in Uganda; the number of new cases attended to daily in Mulago Diabetic clinic has increased to 25patients daily (Bwambale et al., 2014). The above reveals that the poor life style of many people in Uganda do not include exercising, weight management, dietary improvement in their routine play contributes to advancing proneness to diabetes mellitus. There is no information regarding DMT2 and lifestyle modifications among patients in Nakaseke district, yet management of the condition requires having a life style approach that includes exercising and eating right. The study aims at examining the approaches to the adherence to life style modifications among type 2 diabetic patients attending Kiwoko Hospital, Nakaseke district to adverse an understanding of the problem.

1.2 Statement of the problem

Kiwoko hospital receives about 150 DMT2 patients from Kiwoko village and the surrounding villages within Nakaseke district. Majority (80%) of the DM patients at Kiwoko hospital have DM related complications with half of them occasionally reporting to the hospital with uncontrolled sugar levels and diabetic neuropathies (Kiwoko Hospital Data, 2015). Life style of many people in Uganda do not include exercising, weight management, dietary improvement in their routine, this contributes to advancing proneness to diabetes mellitus (Bwambale et al., 2014).

Adherence to life style modifications is a problem common with type 2 diabetic patients (Delamata 2006) yet the risk of complications of diabetes can be reduced by proper adherence to life style changes (Gundala et al,2016). According to International Diabetic Federation, of which Uganda is a member country, there are 400,600 people in Uganda registered with Diabetes Mellitus (IDF, 2015).

The focus of the government in advancing free medical care and other support systems in Uganda has attained less success. The rising challenge of the condition remains a threat to the livelihood of the people (UDHS, 2017).

Kiwoko hospital holds diabetic clinics every Friday, and within these clinics, Health literacy on prevention and control of DM type II and its consequences is carried out. Which includes; health education on the lifestyle modifications and management of DM related complications. However, despite these interventions, there are still majority of DM patients who do not adhere to the lifestyle modifications hence a high prevalence (80%) of DM related complications among DMT2 patients at Kiwoko Hospital (Kiwoko Hospital Data, 2015).

Therefore this study aimed to address an urgent need to assess the factors associated with lifestyle modification among patients with Diabetes Mellitus type II.

1.3 Study objectives

1.3.1 General objective

To determine the factors associated with adherence to lifestyle modifications among type 2 diabetic patients attending Kiwoko hospital Nakaseke district, Uganda

1.3.2 Specific objectives

1. To identify the individual factors associated with adherence to life style modifications among type 2 diabetic patients attending Kiwoko hospital, Nakaseke district.
2. To determine the socio-economic factors associated with adherence to life style modifications among type 2 diabetic patients attending Kiwoko hospital, Nakaseke district.
3. To assess the association between DM related complications with adherence to life modifications among type 2 diabetic patients attending Kiwoko hospital, Nakaseke district.

1.4. Research questions

1. What individual factors are associated with adherence to life style modifications among type 2 diabetic patients attending Kiwoko hospital, Nakaseke district?
2. What socio-economic factors are associated with adherence to life style modifications among type 2 diabetic patients attending Kiwoko hospital, Nakaseke district?
3. What association is there between DM related complications and adherence to life style modification among type 2 diabetic patients attending Kiwoko hospital, Nakaseke district?

1.5 Significance of the study

Health literacy is the most cost effective strategy for prevention and control of diabetes type II and its consequences. This creates awareness on life style modification strategies. Therefore information that will be gained from this study on factors associated with adherence to lifestyle medication strategies among DM type II patients will be significant in the following ways.

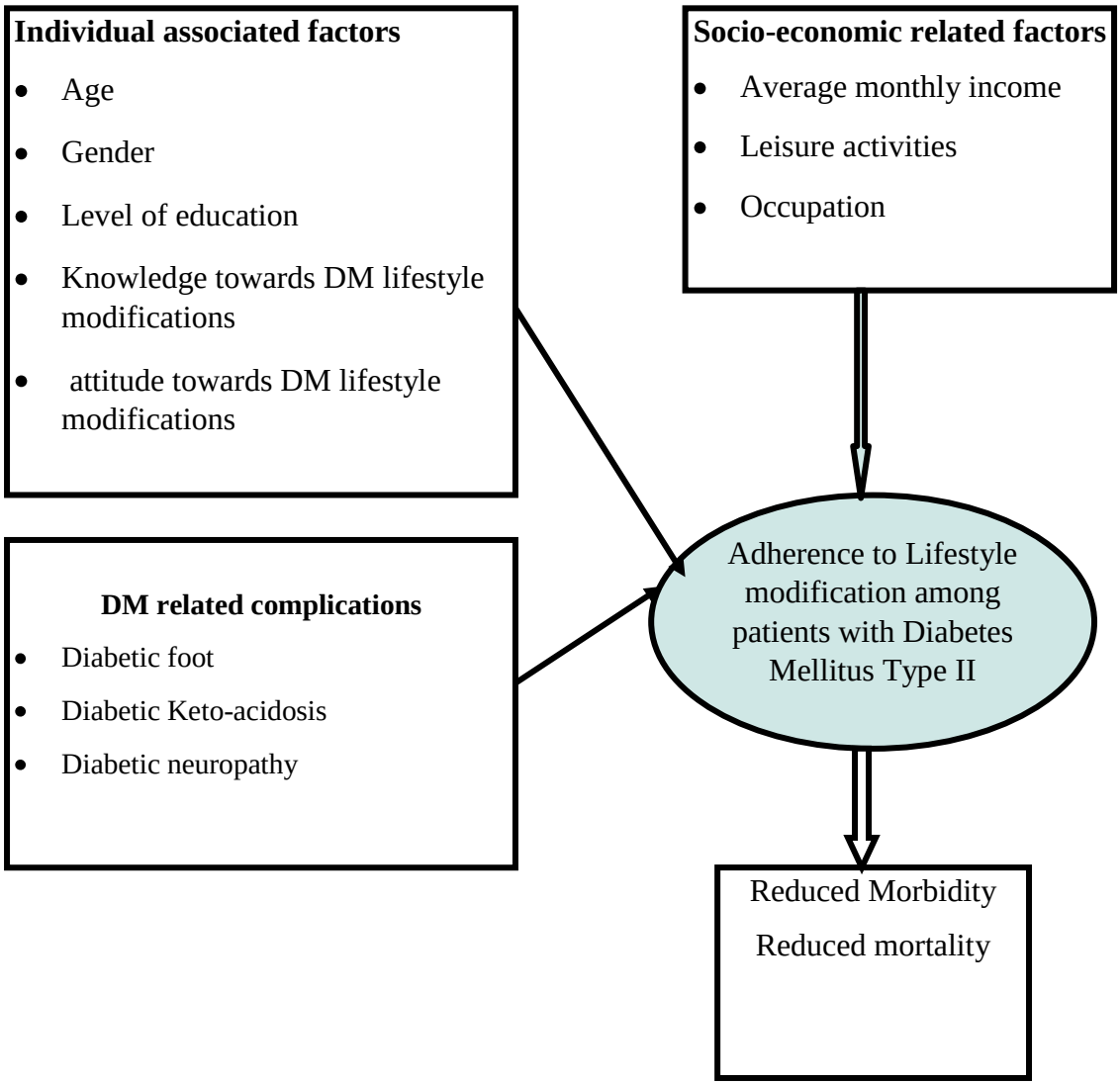
This will help the government to properly plan for the diabetic patients in kiwoko through the information provided by the study about adherence percentage to life style modifications, the study will provide information on the subject that will be helpful in decisions regarding preventative strategies.

There are not enough published findings regarding knowledge, attitudes and practices on Diabetes Mellitus type II in Uganda. This research will document literature on factors associated with adherence to lifestyle medication strategies among DM type II patients in Uganda. This will also provide a base on which future researchers focus to examine the topic further.

The results of this study will also provide the data that will be used by diabetic clinics in the country, Kiwoko Hospital, Mulago hospital, Ministry of health and NGOs that may be trying to improve diabetic prevention strategies.

1.6 Conceptual frame work

Figure 1: Conceptual framework



CHAPTER TWO: LITERATURE REVIEW

2.0 Introduction

This Chapter presents review of existing literature from previous studies conducted on Diabetes Mellitus. The review is to avail literature related to the study objectives in the following sub-themes; overview of individual factors, socio-economic factors and diabetic complications with regards to lifestyle medication among DM type II patients.

2.1 Individual factors associated with adherence to and lifestyle medication among DMT2 patients

Diabetes care priorities have shifted towards patient-centered and behavioral approaches towards living successfully with Diabetes (Hilliard et al., 2015). Contemporary lifestyle modification measures have helped to fulfill this goal.

Adherence to life style modification positively influences treatment efficacy and prevention of complications among patients with DMT2.Life style modification alongside medication slows disease prognosis by avoiding unwanted complications and decreasing frequency of clinical and emergency room visits (Halpern et al., 2006; Cramer et al., 2008; Huther et al., 2013). Diabetic Patients are considered to be adherent to their treatment which includes lifestyle modification if they follow the instructions of their health professional (Alkatheri et al., 2013).

Various individual factors have been associated with adherence to lifestyle modification among patients with DMT2. These include age, gender, level of education, income, knowledge and attitude towards DMT2.

Age

DMT2 exists more commonly among Adults. it is estimated globally according to WHO data estimated that the world prevalence of diabetes among adults (aged 20–79 years) was 6.4%, affecting 285 million adults, in 2010, and will increase to 7.7%, and 439 million adults by 2030 (Shaw et al., 2010).

The prevalence of diabetes increased with increasing age 3.2%, 11.5%, and 20.4% among persons who were 20 to 39, 40 to 59, and ≥60 years of age, respectively and with increasing weight (Yang et al., 2010).

Gender

Higher global adherence to life style modification has been reported among males with a higher level of education. These have physical activity for more than 40 hours per week (Najjar et al., 2015).

A significant higher level of adherence of life style modifications among males has been attributed to higher education level of males who have a better chance of education in most parts of the world than their female counter parts, higher financial freedom and less after work occupation at home. this avails them with time to do physical activities (Yaya et al., 2014; Secrest et al., 2011; Olivares et al., 2013).

Level of education

Previous studies have revealed that persons with good knowledge and education have good care of Diabetes, this is helpful for early detection, prevention and adherence to life style modification and minimize the complications of the disease (Demajo et al., 2013; Rani et al., 2009; Zaman et al., 2012; Berkman et al., 2011; Al-Maskari et al., 2013).

Higher levels of education have convincingly been reported to b associated with lifestyle modification diabetic patients.

This is attributed to aspects of information such, knowledge on how to act. This is justified by the complexity of the information that requires higher education levels and ease of interaction with health professional among educated patients (Alkatheri et al., 2013; Marks et al., 2010; Modig et al., 2010; Gadkari et al., 2013). Higher level of education is associated with having higher self-awareness and information seeking.

DMT2 patients must be taught how to take care of their feet, inject insulin, recognize complications and life style modifications needed to cope with living with Diabetes (Adeniyi et al., 2015; Kumar et al., 2010). Intervention with diabetic education yielded improvement in glycemic control amongst poorly controlled T2DM, who were in the unfamiliar group (10.7% versus 9.5%, $p = 0.04$). Educated diabetic patients tend to have a good attitude, which is linked to improvement in glycemic control (Khattab et al., 2011).

Diabetes education should be evidence-based and structured according to the level of education characteristics of each patient (Amod et al., 2012). According to Kumar and Clark, if health care workers fail to provide appropriate information basing on the level of education of a patient, then friends and family members give patients all sorts of inaccurate information (Kumar et al., 2009). Diabetic educators are crucial to the successful implementation of diabetic education programs (Khattab et al., 2010). However, very few public health care

facilities in low income countries can boast of diabetic educators; (Amod et al., 2012). Therefore, time to educate patients is limited given the various educational levels of patients and shortage of health personnel.

Knowledge regarding lifestyle modification among DMT2 patients

Diabetic patients should have basic knowledge of the life style modifications and treatment goal and what is necessary to achieve this. Basic knowledge of diabetes is considered a prerequisite for self-care management (Santos et al., 2013). Every diabetic patient should, at a minimum, know about the disease condition, complications, treatment options and dietary adjustment. This concept is supported by earlier studies, which suggested that patients with chronic diseases who are engaged and are active participants in their health care have better health outcomes (Inzucchi et al., 2012; Santos et al., 2013; Najjar et al., 2015; Gautam et al., 2015).

Adequate knowledge and the right attitude towards DMT2 and life style modification is essential for appropriate adherence to both life style modification and drug taking behavior among patients with DMT2 (Najjar et al., 2015; Gautam et al., 2015).

The depth of information that is entailed in life style modification ranges dietary adjustments, exercises, self monitoring of blood glucose, weight target and many others (Santos et al., 2013; Suzuki-Saito et al., 2013; Shrivastava et al., 2013). These start at the time of diagnosis and are updated at regular intervals. The benefits of maintining normal body mass index through life style modification must always be critical in management of DMT2

Various studies have convincingly associated adequate knowledge and attitude to adherence to life style modification. for instance a study among geriatric Palestinian cohort showed a global knowledge and global adherence scores were (67.57%) and (89.29%), respectively (Najjar et al., 2015). patients with a higher level of knowledge are more adherent to life style modification thus contributes to the development of guidelines for treatment and may consequently lead to favourable clinical outcomes and saving of health care costs.

In a study that evaluated Knowledge and associated factors towards type 2 diabetes among a rural population in the Red River Delta region, Vietnam, findings showed that Knowledge about type 2 diabetes (T2D) and attitude towards the condition are known to affect compliance and play an important role in diabetes management. T2D knowledge is a prerequisite for individuals and communities to take action on control of the disease (Binh et al., 2015).

Many patients who have type 2 diabetes mellitus require several life style modifications. Factors that appear to influence adherence to these modifications include the patient's emotional well-being. Outcomes research emphasizes the importance of effective patient-provider communication in overcoming some of the barriers to adherence to these lifestyle modifications (Rubin et al., 2005).

The contrary, studies have revealed that despite having the right information on lifestyle modification approaches, very few patients adhere to these practices. For instance; Ranasinghe et al., (2015) reported that DMT2 patients have difficult incorporating this knowledge into their lives mostly due to social circumstances. The majority described a list of 'good foods' and 'bad foods' for DM. They believed that 'good' foods can be consumed at all times, irrespective of quantity and 'bad' foods should be completely avoided. Many believed that fruits were bad for diabetes, while vegetables were considered as a healthy food choice. The majority thought that there were 'special' foods that help to control blood glucose, the most common being curry leaves and bitter gourd. Most study participants were aware of the importance of being physical active. However, there was lack of consensus and clarity with regards to type, duration, timing and frequency of physical activity (Ranasinghe et al., 2015).

Despite understanding the importance of dietary control and physical activity in the management of diabetes, adherence to practices were poor, mainly due to lack of clarity of information provided. There were many myths with regards to diet, some of which have originated from health care professionals. More evidence is needed to support or refute the claims about 'special' foods that the participants believe as being good for diabetes.

A study involving 207 type 2 diabetic patients in India revealed that 83.3% of participants had poor knowledge of lifestyle modification as a non-pharmacologic treatment for diabetes mellitus. (Malathy et al, 2011).

A cross-sectional study in South Africa reported that no respondents had knowledge, 92.6% had scanty knowledge of the benefits of weight loss, healthy diet and exercises (Ikombele., 2011). Majority of the respondents, 97.7% had bad practices in relation to lifestyle modifications (regular physical activity, weight loss and dietary changes that include eating food with high amount of fibre) (Ikombele., 2011).

Attitude towards adherence to lifestyle modifications

A cross-sectional study in South Africa reported 84.3% had positive attitudes towards lifestyle modifications (Ikombele., 2011).

Furthermore, in a study of 1982 diabetic patients in Kenya, 28% of the participants had a good attitude toward lifestyle modification; 75% had poor dietary practice; and 72% did not exercise regularly (Kiberenge, 2010)

In Uganda, there were 400,600 cases of diabetes (both type I and type II) in the year 2015 (IDF., 2015). A research carried out in Iganga, Uganda showed that diabetes was perceived to be a very severe disease (Mayege et al., 2014). The severity of Diabetes Mellitus was attributed to its incurability and its numerous health effects (Mayege et al., 2014). Men were also concerned about reduced sexual performance (Mayege et al., 2014). However, participants' strong concerns about the severity of diabetes were not reflected in their perceptions about the risk factors and lifestyles associated with it (Mayega et al., 2014).

2.2 Socio-economic factors related to adherence to and lifestyle medication among DMT2 patients

Due to rapid uncontrolled urbanization and major changes in lifestyle in Sub-Saharan Africa, the prevalence and burden of Diabetes Mellitus type II is rising quickly (Mbanya et al., 2010).

Average Income

DMT2 patients with higher monthly income have been reported to have a higher adherence to life style modification. This has been partly attributed to enough saving that can enable them to cater for activities such as appropriate diet and gymnastics (Huther et al., 2013).

Adherence to lifestyle modification is correlated to higher level of income since participants with higher income also have higher educational status and improved social status. Moreover, a low socio-economic status is more likely to be accompanied to DM complications. In addition, studies have reported irregular daily routine, difficult living circumstances, psychological disorders and unemployment have been strongly associated with non-adherence to life style modification among DMT2 patients (Wasti et al., 2013; Secrest et al., 2011; Olivares et al., 2013).

Low monthly income states are an important reason why blood sugar is not controlled. Patients have explained how lack of money was contributing to poor control of their blood sugar: 'No money for taxi, hence, cannot keep clinic appointments and cannot go to clinic to

fetch my pills.' 'I don't eat breakfast and I cannot drink pills on an empty stomach, sometimes, no money to buy food at home (Adeniyi et al., 2015)..

Lack of money is linked to the dietary adjustment required for the control of their blood sugar, which seemed impossible because the majority of the diabetic patients are very poor. They have no money to buy a glucometer to monitor blood sugar at home and adhere to proper life style modifications needed for a DMT2 patient (Adeniyi et al., 2015).

Leisure activities

Diet and physical activity are important lifestyle modifiable factors that play a central role in the incidence, severity and management of DMT2. (Ranasinghe et al., 2015).

Energy intake in excess of bodily requirement resulting in obesity is a major driving force behind escalating type-2 diabetes epidemics worldwide (Hu et al.,2011).

Studies have shown that quantity and quality of the diet are both independently associated with the risk of diabetes. Nutrition therapy as one of tools for life style modification is recommended for all people with type-2 diabetes as an essential component of the overall management plan (Evert et al., 2014).

There are numerous guidelines on nutritional recommendations for patients with diabetes mellitus, published by many leading organizations around the world, including the American Diabetes Association (ADA) (Evert et al., 2014).. In its position statement, the American Dietetic Association strongly emphasizes that the total diet or overall pattern of food eaten is the most important focus of a healthful eating style. All foods can fit within this pattern, if consumed in moderation with appropriate portion size and combined with regular physical activity (Freeland et al., 2002).

Studies have shown that in most situations, nutrition messages are more effective when focused on positive ways to make healthful food choices over time, rather than individual foods to be avoided (Wansinki et al., 2006). Many developing nations, including are currently experiencing rapid economic and social development which promotes over-nutrition and positive energy balance (Hu et al.,2011). Traditional dietary patterns are changing, with the population adapting to more industrialized and urban food environments.

Physical activity is important in the management of diabetes. The ADA recommends two types of physical activity for patients with diabetes, aerobic exercises and strength training. The ADA recommends 30 min of moderate-to-vigorous intensity aerobic exercise at least 5

days a week or a total of 150 min per week, and some type of strength training at least two times per week in addition to aerobic activity (ADA, 2015).

Increased physical activity reduces the risk of diabetes, whereas sedentary behaviour is known to increase the risk (Katulanda et al., 2013).

Physical inactivity is known to be associated with obesity, diabetes, hypertension and metabolic syndrome Increased mechanization has displaced physical activity over the last century in industrialized nations, a trend that is increasingly observed in developing countries as well (ADA, 2015; Katulanda et al., 2013).

In a study that sought to evaluate the effect of time spent watching TV Diabetes type 2, findings showed that watching TV was positively associated with risk of obesity and type 2 diabetes. TV watching was associated with a 23% increase in obesity and a 14% increase in risk of diabetes; each 2-h/d increment in sitting at work was associated with a 5% increase in obesity and a 7% increase in diabetes. In contrast, standing or walking around at home was associated with a 9% reduction in obesity and a 12% reduction in diabetes. Each 1 hour per day of brisk walking was associated with a 24% reduction in obesity and a 34% reduction in diabetes. We estimated that in our cohort, 30% of new cases of obesity and 43% of new cases of diabetes could be prevented by adopting a relatively active lifestyle (Hu et al., 2014).

Another study that assessed the effects of rehabilitation on functional capacity, obesity and health behaviour, among DM2 findings showed that The DM2 group was more obese, had lower exercise capacity and responded somewhat less to CR than other cardiac patients. Follow up after 6 months did however show that they continued their regular exercise and walking capacity was still retained (Kristjánsson et al., 2015).

In a study that evaluated Urban –rural differences in prevalence of self-reported diabetes in India showed that abdominal obesity and physical inactivity are associated with diabetes in this study (Mohan et al., 2008). Tuomilehti et al., 2001, reported that, Type 2 diabetes mellitus is increasingly common, primarily because of increases in the prevalence of a sedentary lifestyle and obesity. The reduction in the incidence of diabetes was directly associated with changes in lifestyle (Tuomilehti et al., 2001).

2.3 Diabetes complications and adherence to lifestyle modification among DMT2 patients

Diabetes Mellitus is associated with long-term damage, dysfunction, and failure of various organs, especially the eyes, kidneys, nerves, heart, and blood vessels (ADA., 2010; Soriguer

et al., 2012; Cowie et al., 2010). This can play a role in the cause of morbidity and mortality through continued clinical assault to vital organs (Gautam et al., 2015). Poor glycaemic control amongst DMT2 patients constitutes a major cause for most complications of DMT2. The progression of Diabetes complications mainly occurs due to poor glycaemic control, which can be managed by adherence to lifestyle modification (Oladele et al., 2015).

However adherence to lifestyle modification has been proved to slow disease prognosis by avoiding unwanted complications and decreasing frequency of clinical and emergency room visits (Halpern et al., 2006; Cramer et al., 2008; Huther et al., 2013). In a study that examined Diabetes self-care behaviors and clinical outcomes among Taiwanese patients with type 2 diabetes showed that most patients took their took their medications and over half followed recommended meal plans and exercised, but fewer performed foot care (38%) or checked their blood glucose levels (20%) regularly. This was related to fewer complications of the disease (Ouyang et al., 2015).

Continued unhealthy risky life style behaviors such as tobacco use, alcohol use, physical inactivity, unhealthy diet, overweight and obesity are accountable for increase incidences of DMT2 complications such Diabetic keto-acidosis and diabetic neuropathy (Jeon et al., 2008, WHO, 2010). Life style modifications can be controlled by the patients themselves through effective education and enhanced knowledge. Self-care management that encompasses life style medication is associated with a reduction of complication and improvement in quality of life of diabetic patients (Santos et al., 2013; Suzuki-Saito et al., 2013; Shrivastava et al., 2013).

Evaluating patients' perceptions and knowledge about healthy lifestyles (diet and physical activity) would help in the development of evidence based interventions, aimed at curbing the ongoing epidemic of diabetes. Research is an invaluable tool in evaluating patient perceptions. it helps to generate a wide array of different perceptions/ comments/observations from a vast population over a short period of time, therefore this study will seek to assess the factors associated with adherence to lifestyle modification among type 2 diabetic patients attending Kiwoko hospital.

CHAPTER THREE: METHODOLOGY

3.0 Introduction

This chapter describes the methods used in the study. It chronologically presents the study area, design, data sources, study population, sample size determination, sampling procedures, study variables, data collection techniques and tools, data analysis plan, quality assurance issues, plan for dissemination of findings, ethical considerations and limitations of the study.

3.1 Study Area

This study was done at Kiwoko hospital, it is located in Nakaseke district approximately 64 KM from Kampala capital city. The hospital has a medical department which operated a diabetic clinic, a surgical department, children's department and gynecology and obstetric department. it serves communities of Nakaseke, Luwero and Nakasongola districts.

3.2 Study Design

The study utilized a cross sectional study design. This was chosen because a cross-sectional research design is most suitable for generating data on a variable of interest in a specified short time frame and it is suited for studies assessing the cause and effect simultaneously at a point in time (Polit et al, 2004).

3.3 Sources of data

Primary and secondary data was utilized in this study. Primary data was obtained from a researcher administered questionnaire, for respondents who are able to read and those who were not be able to read and write, interviewer administered questionnaires were opted for. Secondary data will be obtained from previously published literature on the subject under investigation.

3.4 Study population and study participants.

The target population comprised of all DM patients attending Kiwoko hospital while as the accessible population comprised of all DM type II patients attending to the hospital during a period of data collection.

3.5 Eligibility criteria

3.5.1 Inclusion criteria

Participants above 18 years of age, have a primary diagnosis of DM type II and have Karnofsky score of above 60 (ambulatory). Patients able to understand the study objectives were enrolled in the study.

3.5.2. Exclusion criteria

DM patients who were mentally unhealthy and those who were too ill to respond were exluded from the study.

3.6 Sample size determination

The overall sample size was estimated using Kish and Lesley formula (Kish and Lesley, 1965). This formula was used because it is appropriate for determining proportions of a variable in a given infinite population.

$\mathbf{n=z^2pq/e^2}$

P= prevalence of type 2 diabetes= 8.1% (0.081) from a study conducted by lansky et al, 2002 in Kamplala and Mukono district.

Q=1-p

Z=1.96

E=5% (0.05)

$n= 1.96^2*0.081*0.919/0.05^2$

n=114 Type 2 diabetes patients

3.7. Sampling technique

Simple random sampling technique was used to select participants. This is because it minimizes errors associated with selection bias. Patients with a confirmed DM diagnosis will be confirmed from the clinic register.

3.8 Sampling procedure

The lottery method was applied. Each of the diabetic patients at the diabetic clinic was assigned a unique number, ranging from 1-40. The numbers were placed in a bowl and thoroughly mixed. The patients were then requested to pick out one number each. 30 members who picked out a number ranging from “1-30” were selected, while ensuring gender

equality. This procedure was repeated during every diabetic clinic until the required sample size was obtained.

3.9 Study variables

3.9.1 Dependent variable.

Adherence to life style modification among Patients with type II DM

3.9.2 Independent variables

The individual factors; age, gender, level of education, knowledge regarding lifestyle modifications and attitude towards lifestyle modifications.

The socio-economic factors which included; average monthly income, occupation, and leisure activities. DM related complication such as; diabetic foot, diabetic ketiacidosis, and diabetic neuropathy

3.10 Data collection techniques and tools.

Data collection was by use of self-administered questionnaires for respondents who can read and write and researcher-guided questionnaires for those who can't read and write. It contained three sections with 25 items. Section A assessed individual data. Section B assessed socio-economic characteristics of the patients.

Section C assessed practices related to life style modification and adherence to the theses strategies among the patients.

3.11 Plan for data analysis

3.11.1 Data management

Questionnaires were checked for completeness after the interview, coded and data entered in Microsoft excel. Data was then exported and analysed using SPSS version 20.0 statistics for windows (IBM Corp, Armonk, NY).

Data on adherence to lifestyle medication was dichotomized into *'**Adherent*** and ***'NON Adherent'***.

Baseline data on variables was summarized in frequency tables, graphs and pie charts. Bivariate relationships between variables of interest were obtained using chi- square test, odds ratio and P-values will be used to assess the associations. P-values of less than 0.05 will be considered significant.

Bivariate analysis was conducted using chi square, and Spearman's coefficients, to determine the associations of each independent variable with the dependent variable.

3.12 Quality assurance

3.12.1 Data Reliability

Reliability of variables was done to assess whether variables measured the intended outcome. The questionnaire was translated into Luganda to cater for language barrier, this was done due to the fact that most patients at Kiwoko are able to understand this language

Pilot study: - The questionnaire was pre-tested in a pilot study to ensure that the specific questions answered the study objectives. A convenience sample of 20 patients was included in a pilot questionnaire pre-test survey to ensure survey methods and questionnaire used were applicable and feasible. Respondents with similar characteristics to the study sample will be interviewed during the pilot study.

Misclassification of participants: - misclassification of non- type II DM patients in this study was minimized by selecting only those patients with a confirmed diagnosis of DM type II basing on medical reports.

3.12.2 Data Validity

Variables with a Cronbach's alpha of above 75% were considered. For purposes of consistency, accuracy, legibility and completeness: - the data collected was checked by the researcher at the end of the data collection to ensure completeness of every questionnaire. Questionnaires were kept under lock and key for further reference.

3.13 Plan for dissemination.

The findings will be presented to Kiwoko Hospital, International Health Sciences University library and the Ministry of Health. The findings will also be published in different journals.

3.14 Ethical considerations

- The research protocol was approved by the School of Nursing of International Health Sciences University.
- Another approval was obtained from the administration of Kiwoko hospital.
- The researcher always introduced self to respondents; got an informed consent for participation in the study.

The study is entirely for academic purposes; participants voluntarily took part in the study and were allowed to exit from the study at any point of the study.

CHAPTER FOUR: RESULTS

4.0. Introduction

This chapter presents the findings of the study, analysis and interpretation.

Data was collected using semi-structured questionnaires. Chi-square test was used to compare proportions, the confidence interval set at 95%. A result yielding a P value of less than 0.05 was considered to be statistically significant. The data was presented using frequency tables, cross tabulations, bar charts and pie charts which are effective ways of communicating research results.

4.1. Response rate

The desired sample was 114; since diabetic clinics are spetial clinics that are run on a daily basis, Only 96 type 2 diabetes patients were able to complete the questionnaires giving a response rate of 84.2% as shown below.

Total number of questionnaire filled=96

Desired sample size=114

Response rate=96/114*100

=84.2%

4.2. Descriptive analysis

4.2.1. Individual factors of the respondents

Majority of the respondents were female 76(79.2%), majority were above 45 years of age 53(54.6%), Half of the respondents had no formal education 48 (50.0%). Only one respondent did not have knowledge about lifestyle modifications of DMT2 patients and majority of the respondents 74(77.1%) had a good attitude towards adhering to the lifestyle modifications.

Table 1: Individual factors of the respondents

Variable	Frequency	Percentage
Gender		
Male	20	20.8
Female	76	79.2
total	96	100
Age		
25-34	5	5.2
35-45	38	39.6
Above 45	53	55.2
Total	96	100
Level of education		
No formal education	48	50.0
Primary level	38	39.6
Secondary level	5	5.2
Tertiary level	5	5.2
Total	96	100
Have you ever heard about lifestyle modifications of diabetic patients?		
Yes	95	99.9
No	1	1.0
Total	96	100
Do you think it is good to adhere to lifestyle modification?		
Yes	74	77.1
No	22	22.9
Total	96	100

4.2.2 Adherence level of the respondents

Data on adherence to lifestyle medication was dichotomized into *'**Adherent*** and ***'NON Adherent'***.

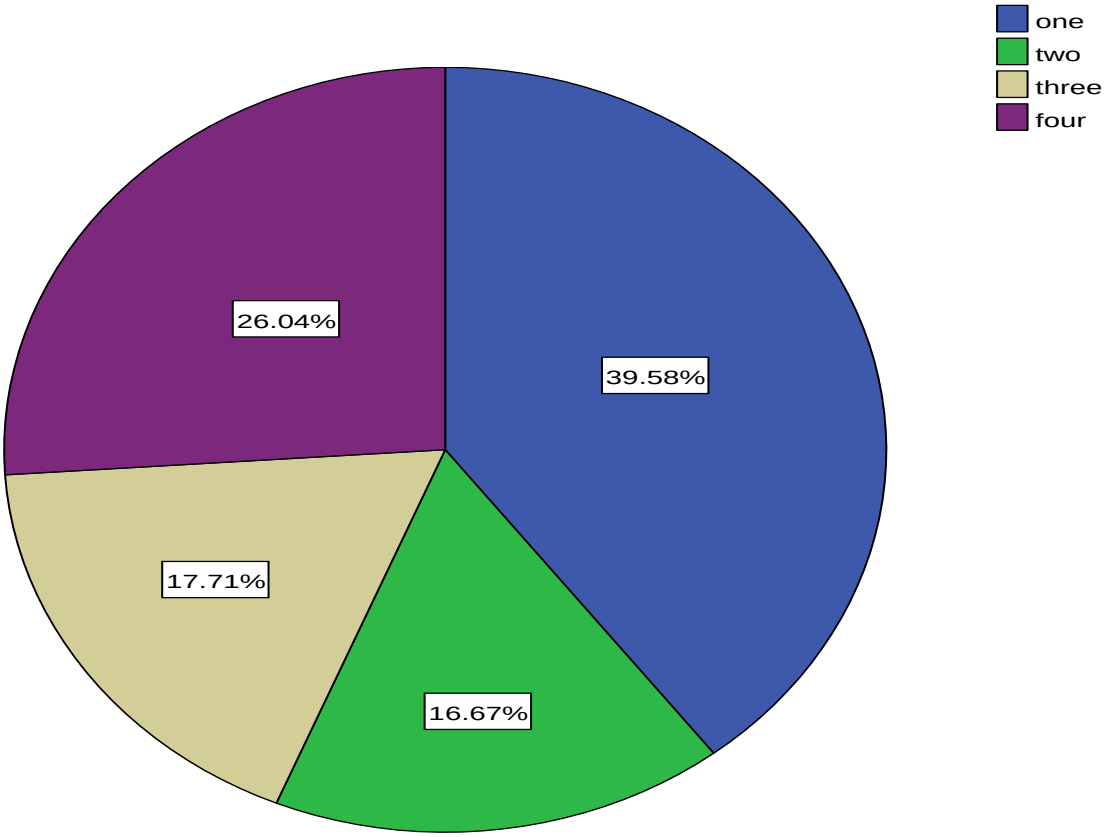
Using the Morisky-4 item measuring adherence scale, every yes answer scored 1mark. Respondents with 0-1 score were considered adherent while those with 2-4 score were considered non-adherent. 38 scored 1, 17 scored 2, 17 scored 3, and 26 scored four.

More than half of the respondents 58(60.4%) were non-adherent while 38(39.6%) were adherent.

Table 2: Adherence to lifestyle modifications

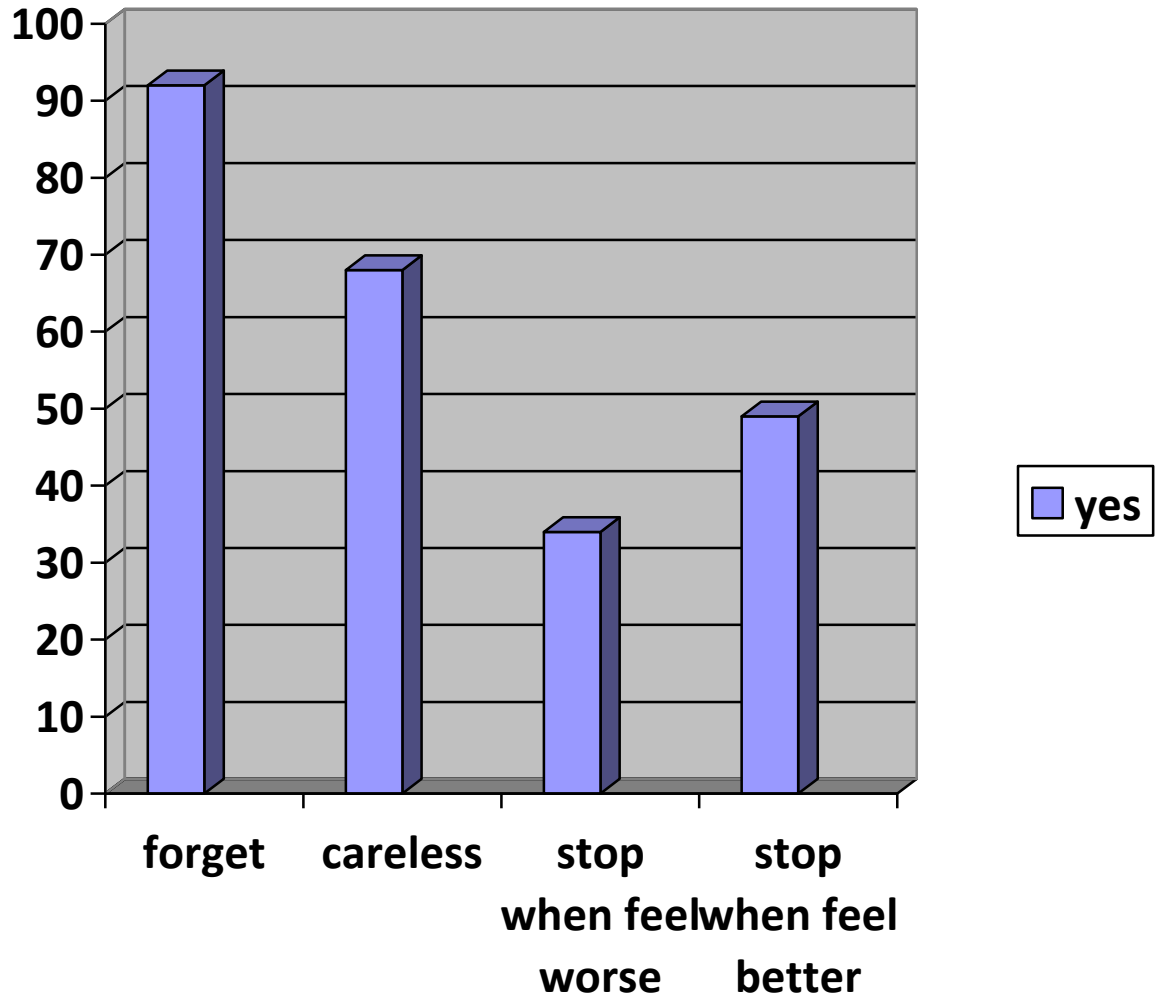
Adherence level	Frequency	Percentage
Adherent	38	39.6
Non-adherent	58	60.4
Total	97	100

Figure 2: Proportion of scores



91 of the respondents reported forgetting to put lifestyle modifications in to practice, 67 reported being careless at times about taking lifestyle modifications into practice, 33 reported that they stop taking lifestyle modifications into practice if they feel worse, and 48 reported that they stop taking life style modifications in to practice when they feel better.

Figure 3: frequency of those who answered yes



4.2.3 Univariate analysis of socio-economic factors

More than half of the respondents 58(59.4%) had an average monthly income of 10,000-200,000sh, half of the respondents 48(50.0%) were involved in farming and more than half 52(54.2%) spend 5,000-10,000sh on their drugs.

Table 3: Socio-economic factors of the respondents

Variable	Frequency	Percentage
Average monthly income		
10,000-200,000	57	59.4
200,001-500,000	39	40.6
Total	96	100
Current occupation		
Farming	48	50.0
Trading	39	40.6
Food vendors	9	9.4
Total	96	100
Monthly expenditure on drugs		
5,000-10,000	52	54.2
10,001-20,000	44	45.8
Total	96	100

4.2.4 Univariate analysis of lifestyle modifications

Majority of the respondents 86(89.6%) practice dietary modifications, 29(30.2%) practice physical exercises, 15(15.6%) monitor blood sugar levels, 86(89.6%) attend diabetic clinics, 62(64.6%) practice self-care behaviors such care of the lower limbs and 81(84.4%) abstain from abuse of substances such as tobacco and alcohol.

Table 4: Lifestyle modifications practiced by the respondents

Variable	Frequency	Percentage
Dietary modification		
Yes	86	89.6
No	10	10.4
Total	96	100
Physical exercise		
Yes	29	30.2
No	67	69.8
Total	96	100
Monitoring of blood sugar levels		
Yes	15	15.6
No	81	84.4
Total	96	100
Attendance of DM clinics		
Yes	86	89.6
No	10	10.4
Total	96	100
Self-care behaviors		
Yes	62	64.6
No	34	35.4
Total	96	100
Abstinence from abuse of substances		
Yes	81	84.4
No	15	15.6
Total	96	100

4.2.5. Univariate analysis of complications of diabetes

39(40.6%) of the respondents have or have ever had diabetic foot, 44(45.8%) have ever had emergency visits to the hospital due to uncontrolled sugar levels and 38(39.6%) have or have ever had damage to the eyes and nerves due to diabetes.

Table 5: Complications experienced by the respondents

	Frequency	**Percentage**
Diabetic foot		
Yes	39	40.6
No	57	59.4
Total	96	100
Uncontrolled sugar levels		
Yes	44	45.8
No	52	54.2
Total	96	100
Damage to eyes and nerves		
Yes	38	39.6
No	58	60.4
Total	96	100

4.3. Bivariate analysis of individual factors with adherence to lifestyle modifications

Age of the respondents (P=0.000) had significant association with adherence to lifestyle modifications. Gender (P=0.136), education status (p=0.293), Knowledge about life style modifications (P=0.418) and attitude towards lifestyle modifications (P=0.181) were not significantly associated with adherence to lifestyle modifications.

Table 6: Association between individual factors and adherence to lifestyle modifications

Individual variables	**Adherence**		**Chi-square**	**p-value**
Gender	**Adherent**	**Non-adherent**		
Male	5	15	0.134	0.136
Female	33	43		
Age				
25-34	0	5		
35-45	9	29	0.002	0.000
Above 45	29	24		
Level of education				
No formal education	19	29		
Primary level	14	24	0.012	0.293
Secondary level	0	5		
Tertiary level	5	0		
Knowledge about lifestyle modifications				
Yes	38	57	0.416	0.418
No	0	1		
Attitude towards adherence				
Positive	32	42	0.179	0.181
Negative	6	16		

4.4 Bivariate analysis of socio-economic factors with adherence to life style modifcations

Average monthly income of the respondents had a significant association with adherence to lifestyle modifications (P=0.000).

Current occupation (P=0.064) and monthly expenditure on drugs (P=0.509) had no significant association with adherence to lifestyle modifications.

Table 7: Association of socio-economic factors with adherence

Socio-economic variable	**Adherence**		**Chi-square**	**P value**
Average monthly income	**Adherent**	**Non-adherent**		
10,000-200,000	14	43	0.000	0.000
200,001-500,000	24	15		
Current occupation				
Farming	14	34		
Trading	19	20	0.105	0.064
Food vendors	5	4		
Monthly expenditure on drugs				
5,000-10,000	19	33	0.507	0.509
10,001-20,000	19	25		

4.5 Bivariate analysis of complications related to dmt2 with adherence to lifestyle modifications

Emergency visits to the hospital due to uncontrolled sugar levels (P=0.006) and damage to the eyes and nerves due to diabetes (P=0.000) had significant association with adherence to lifestyle modifications.

Diabetic foot had no significant association with adherence to lifestyle modifications (P=0.853).

Table 8: Association of complications with lifestyle modifications

	Adherence		**Chi-square**	**P value**
Diabetic foot	**adherent**	**Non-adherent**		
Yes	15	24	0.853	0.853
No	23	34		
Uncontrolled sugar levels				
Yes	24	20	0.006	0.006
No	14	38		
Damage to the eyes and nerves				
Yes	4	34	0.000	0.000
No	34	24		

CHAPTER FIVE: DISCUSSION OF RESULTS

5.0 Introduction

In this section, the findings of the study are discussed in relation to the literature and the aims and objectives of the study.

The aim of this study was to determine factors associated with adherence to lifestyle modifications among type II diabetic patients.

5.1 Individual factors associated with adherence to DMT2 lifestyle modifications

In this study, gender of the respondents had no significant association with adherence to lifestyle modifications. Higher global adherence to lifestyle modifications has been reported among males with a higher level of education as compared to females with higher level of education (Najjar et al, 2015). Similarly Yaya et al, 2014; Secrest et al, 2011 and Olivares et al, 2013 reported a significant higher level of adherence to lifestyle modification among males. These findings are contrary those of the current study.

In this study, age had a significant association with adherence to lifestyle modifications, all the respondents in the age group 25-34 were non-adherent while majority of the adherents were above the age of 45. According to a study by Yanga et al, 2010, the prevalence of diabetes increased with increasing age 3.2%, 11.5%, and 20.4% among persons who were 20 to 39, 40 to 59, and >60 years of age, respectively.

The current study found no significant association between level of education and adherence to lifestyle modification. On the contrary, Previous studies have revealed that persons with good knowledge and education have good care of diabetes, this is helpful for early detection, prevention and adherence to lifestyle modification and minimize the complications of the disease. (Demajo et al, 2013; Rani et al, 2009; Zaman et al, 2012; Berkman et al, 2011 and Al-Maskari et al, 2013). Higher levels of education have convincingly been reported to be associated with life style modification of diabetic patients (Akatheri et al, 2013).

In this study, almost all of the respondents had knowledge about lifestyle modifications and majority of the respondents had good attitude towards adherence to lifestyle modifications. Diabetic patients should have basic knowledge of the lifestyle modifications and treatment goals and what is necessary to achieve this. Basic knowledge is considered a prerequisite for

self-care management (Santos et al, 2013). Adequate knowledge and the right attitude towards DMT2 and lifestyle modification is essential for appropriate adherence to both lifestyle modifications and drug taking behavior among patients with DMT2 (Najjar et al, 2015 & Gautam et al, 2015). A study by Malathy et al (2011) reported otherwise. It revealed that 83.3%of the patients had poor knowledge on lifestyle modifications.

This current study found no association between knowledge, attitude and adherence to lifestyle modifications. Similarly, studies have revealed that despite having the right information on lifestyle modification approaches, very few patients adhere to the practices. For instance, Ranasinghe et al (2015) reported that DMT2 patients have difficulty incorporating this knowledge into their lives mostly due to social circumstances.

5.2. Socio-economic factors affecting adherence to DMT2 lifestyle modifications

In this study, level of income had a significant association with adherence to lifestyle modifications. Majority of the adherents had a high average monthly income as compared to those with low average monthly income.

DMT2 patients with higher monthly income have been reported to have a higher adherence to lifestyle modification. This has been partly attributed to enough saving that can enable them to cater for activities such as appropriate diet and gymnastics (Huther et al, 2013). This is supported by the fact that adherence to lifestyle modifications is correlated to higher level of income since participants with higher income also have higher educational status and improved social status. Moreover, a low socio-economic status is more likely to be accompanied by DM complications (Wasti et al, 2013).

5.3. Complications related to DMT2

The current study revealed significant association between uncontrolled sugar levels; damage to the eyes and nerves due to DM and adherence to lifestyle modifications. Majority of the non-adherent patients had never had emergency visits to the hospital due to uncontrolled sugar levels and majority of those who had damage to the eyes and nerves due to DM were non-adherent to lifestyle modifications. There was no significant association between having diabetic foot and adherence to lifestyle modifications. A study that examined diabetes self-care behaviors and clinical outcomes among Taiwanese patients with type 2 diabetes showed that most patients took their medications and over half followed recommended meal plans

and exercised but fewer performed foot care or checked their blood glucose levels regularly. This was related to fewer complications of the disease (Quyand et al, 2015).

Continued unhealthy risky lifestyle behaviors such as tobacco use, alcohol use, physical inactivity, unhealthy diet, overweight and obesity are accountable for increase incidences of DMT2 complications such as Diabetic ketoacidosis and diabetic neuropathy (Jeon et al, 2008 & WHO, 2010).

CHAPTER SIX
CONCLUSION AND RECOMMENDATIONS

6.0 Introduction

This chapter presents the conclusion and a set of recommendations for the study.

6.1 Conclusion

This study revealed that majority of the non-adherents were within the age group of 35-45, almost all the respondents had knowledge regarding lifestyle modifications, and majority had a good attitude towards adherence to lifestyle modifications. There was no significant association between gender and adherence to lifestyle modifications.

Further, the study revealed that majority of the respondents who were adherent had a high average monthly income (200,000-500,000sh) as compared to those with low average monthly income. Occupation status was not significantly associated with adherence to lifestyle modifications.

Majority of the non-adherent patients had never had emergency visits to the hospital due to uncontrolled sugar levels and majority of those who had damage to the eyes and nerves due to DM were non-adherent to lifestyle modifications. There was no significant association between having diabetic foot and adherence to lifestyle modifications.

6.2 Recommendations

To the hospital; Emphasis should be placed on the benefit of following dietary advice and other modifications and their effect on glucose control, and on the inevitable reduction of diabetes-related complications. Continuity of care must be instituted to ensure that goals are met and achieved.

To the government and Ministry of Health; Perhaps a model that could assist with planning interventions for Uganda’s health care system, and which would integrate clinical components with resources and support to improve self-care skills and ultimately the quality of life of patients living with diabetes. The ability to source reasonably priced healthy foods could be effective in increasing healthy eating.

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APPENDICES

APPENDIX I: CONSENT FOR STUDY PARTICIPANTS.

I am Nassuna Grace, a final year student at International Health Sciences University offering a Bachelor's degree on Nursing Science. I take this opportunity to invite you to take part in the study investigation factors associated with adherence to lifestyle modifications among type two diabetic patients attending Kiwoko hospital Nakaseke district, Uganda.

The Objectives of this study are to identify the individual factors, to assess the socio-economic factors and to assess the association of DM related complication and adherence to life modification among type 2 diabetic patients attending Kiwoko hospital, Nakaseke district.

Your views will help the researcher to make recommendations to the health care providers and hospital management to address the gaps that contribute to non-adherence and in the long run improve the quality of care provided to diabetic patients.

Confidentiality will be highly maintained and you will not be required to write your name. I also wish to make it clear to you that your participation in voluntary and you may decide not to participate or withdraw at any point of the study. In case of any question about the study, please don't hastate to contact ……

Statement of informed consent

Please sign to confirm your acceptance.

I..... have agreed to participate in the study after the researcher explaining to me the nature of the study. It is by my own choice to participate and I have not been forced.

Participant signature/ thumb print..... Date.....

Researcher's signature..... Date……

APPENDIX II: QUESTIONNAIRES

Serial number…….

Date……

- ✓ **Please select the most correct option [ ]**

Section A: Individual related characteristics of the respondents

1. What is your Gender?

a. Male [ ]

b. Female [ ]

2. Your age in complete year

a. 15-24 years [ ]

b. 25-34 years [ ]

c. 35-45 years [ ]

d. Above 45 [ ]

3. What is your religious affiliation?

a. Christianity [ ]

b. Islam [ ]

c. Traditionalist [ ]

d. Others [ ]

4. **What is your level of education?**

a. Non formal education [ ]

b. Primary level [ ]

c. Secondary level [ ]

d. Tertiary education [ ]

5. What is your household size?

a. 1-4 [ ]

b. 5-8 [ ]

c. More than 8 [ ]

6. What is your marital status?

a. Married [ ]

b. Separated [ ]

c. Divorced [ ]

d. Widow [ ]

e. Single [ ]

Section B socio-economic characteristics of the respondents

Circle all the right answers

7. What is your average monthly income in Uganda shillings?

a. 10,000 to 200,000 [ ]

b. 200,001 to 500,000 [ ]

c. above 500,000 [ ]

8. What is your current occupation?

a. Civil servant [ ]

b. Farming [ ]

c. Trading [ ]

d. Fishing [ ]

e. Food vendors [ ]

f. Others ……. (Specify)

9. How much do you spend on your drugs per month?

a) 5000- 10000 [ ]

b) 10001- 20000 [ ]

c) 20001-30000 [ ]

d) Above 30000 [ ]

Section C: Life style modifications and adherence

11. Do you know about the lifestyle modification measures for type 2 diabetic patients?

a. Yes [ ]

b. No [ ]

12. Do you think it is good to adhere to the life style modification measures needed in the management of DM type 2?

a. Yes [ ]

b. No [ ]

13. Which of the following life style modification measures do you use?

(Please select all that apply)

Life style modification measures as instructed from your health provider	No	Yes
Dietary modification		
Physical exercise		
Monitoring of blood glucose levels		
Attendance of DM clinics		
self-care behaviors such as Care of the lower limbs		
Abstinence from abuse of substances such as tobacco, alcohol etc		

14. Measuring Adherence level; (Morisky 4 item measuring Adherence scale)

Question	Yes	No
Do you ever forget to put into practice the above life style modification measures?		
Are you careless at times about taking into practice the above life style modification?		
Sometimes if you feel worse when you are taking into practice the above life style modification, do you stop taking it?		
When you feel better, do you sometimes stop taking into practice the above life style modification?		

15. Which of the following complication have you ever or are experiencing at the moment?

a. Diabetic foot [ ]
b. Emergency visits to hospital due to uncontrolled sugar levels [ ]
c. Damage to the eyes and nerves due to Diabetes [ ]
d. Others (please specify)

……..

Thank you** for **your cooperation

APPENDIX III: INTRODUCTORY CORRESPONDENCE LETTER

IHSU INTERNATIONAL HEALTH SCIENCES UNIVERSITY
sanitas per scientiam

making a difference in health care

Office of the Dean, School of Nursing

Kampala, 22nd May 2017

To
HUMAN RESOURCE
KIWOKO HOSPITAL (UG).

Dear Sir/Madam,

RE: ASSISTANCE FOR RESEARCH

Greetings from International Health Sciences University.

This is to introduce to you **Nassuna Grace,** Reg. No. **2013-BNS-FT-023** who is a student of our University. As part of the requirements for the award of a Bachelors degree in Nursing of our University, the student is required to carry out research in partial fulfillment of her award.

Her topic of research is: **Adherence to Life Style Modifications Among Type Two Diabetic Patients Aged 35-75 Years in Kiwoko Hospital, Nakaseke District Uganda.**

This therefore is to kindly request you to render the student assistance as may be necessary for her research.

I, and indeed the entire University are grateful in advance for all assistance that will be accorded to our student.

Sincerely Yours,

22 MAY 2017

Ms. Agwang Agnes
Dean, School of Nursing

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