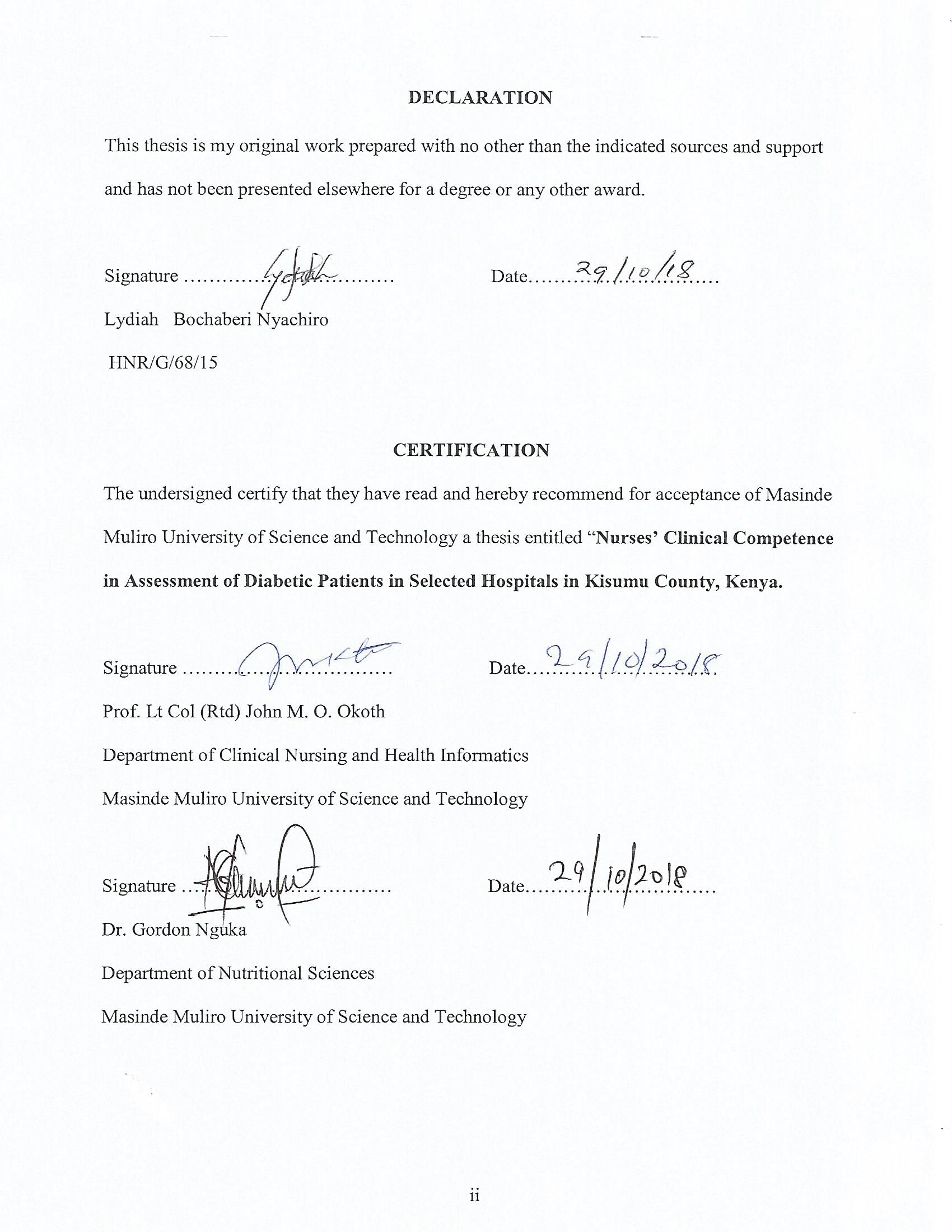
**NURSES’ CLINICAL COMPETENCE IN ASSESSMENT OF DIABETIC PATIENTS IN SELECTED HOSPITALS IN KISUMU COUNTY KENYA**

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**A Research Thesis submitted in partial fulfillment of the requirements for the Degree of Masters of Science in Advanced Nursing Practice (Medical Surgical Nursing) of Masinde Muliro University of Science and Technology**

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**DECLARATION**



# DEDICATION

I dedicate this work to my family members my husband Hezron Marigi, my two daughters Elizabeth and Charity and son John Williams Marigi not forgetting my parents Mr and Mrs. Nyachiro.

# AKNOWLEDGEMENT

To the Almighty God who gave me strength to develop this thesis, School of Nursing and Midwifery faculty staff, the entire School of Graduate studies staff MMUST for their tireless assistance, Prof. John Okoth, Dean School of Nursing and Midwifery (Supervisor).

Dr. Gordon Nguka from Nutrition Department (Supervisor), Dr. Damaris Ochanda for her tireless coordination of the exercise, friends, classmates and others who gave me the support that I needed despite all the challenges throughout this journey. Last but not least to my family members for their humble time and support that cannot be explained.

# ABSTRACT

In nursing, clinical skills competence is a central issue for patient care and a clear understanding of the concept of assessing diabetic patients in various hospitals. According to World Health Organization (WHO) 2010 report, diabetes mellitus and its’ complications affect 10% of adults globally, and it is estimated to become the seventh cause of death of adults by 2030. Diabetic complications do occur as a result of poor glycemic control, lack of optimal maintenance of glycemic control,constant stress levels and work pressures. Nurses’clinical assessment competence has been known to be the indicator in the assessment of diabetic patients who have the potential of developing complications. These complications can lead to an increase in morbidity, mortality rates and increased health care costs. It is therefore the purpose of this study to determine the clinical competence of nurses in assessment of diabetic patients in selected hospitals in Kisumu County. The specific objectives were to assess nurses’ knowledge on the nature and scope of diabetes and its complications, to determine the nurses’ clinical competence in the assessment of diabetic patients and to examine the factors influencing nurses’ competence in the clinical assessment of diabetic patients. A cross sectional quantitative study design was used in the study. The study population involved 96 nurses working in the medical wards, surgical wards and diabetic clinics of selected hospitals. Simple random sampling method and probability proportional allocation was used. Diabetic self-assessment questionairre and an observation checklist were used to collect data. The instruments were piloted before administration to establish their validity and reliability. Data files were collected, coded,entered cleaned, prepared and filtered in a statistical computer package SPSS version 20.0. Data analysis was done using specific tests according to variables as guided by the objectives. Descriptive statistics yielded frequencies and percentages. Chi square was used to show the relationship between variables. The study results found out that there is a strong relationship between the nurses’ knowledge, education levels, experience and their ability to assess and identify the patient needs and prevent diabetic complications. This study focused on nurses’clinical competence in assessment of diabetic patients in selected hospitals in Kisumu County. Majority of the nurses had knowledge on the nature and scope of diabetes mellitus and were able to assess patients to prevent diabetic complications. Only 40 (41.6%) nurses were able to explain how stress affects diabetes. Years of experience, level of education,work environment and institutional management influenced the nursing competencies in assessment of diabetic patients. Fifty six(58.3%) nurses did not have knowledge on Glycosylated Haemoglobin test (HBA1C) and could not perform the test.Based on the results the study recommends that nurses be educated on the effect of stress on diabetes mellitus. Additional specialized training for practicing nurses, on Glycosylated Hemoglobin test in glycemic control for diabetic patients and further studies be done in other counties.

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# LIST OF ABBREVIATIONS AND ACRONYMS

**ACU**  Acute Care Unit

**ADA** American Diabetic Association

**AHC**  Avenue Health Care

**AKHK**  Aga Khan Hospital Kisumu

CC Clinical Competency

**CDE**  Certified Diabetes Educators

**CPD** Continous Professional Development

**DM** Diabetes Mellitus

**DSME**  Diabetic Self-Management Education

**FRIII** Fixed Rate Intravenous Insulin Infusion

**HB1AC** Glyclated Hemoglobin

**HHNS** Hyperosmolar Hyperglycemic Non-- ketotic Syndrome

**I.M** Intramuscular Injection

**I.V** Intravenous Infusion

**JCAHO** Joint Commission on Accreditation of Health care Organizations

**JOOTRH** Jaramogi Oginga Odinga Refferral and Training Hospital

**KCH** Kisumu County Hospital

**KNH** Kenyatta National Hospital

**MNT**  Medical Nutrition Team

**MODY** Maturity Onset of Diabetes of the Young

**NCD** Non Communicable Diseases

**NHS** National Health Strategy

**PH** Potential of Hydrogen

**PML** Polymorph Nuclear Leukocyte

**UK**  United Kingdom

**WHO** World Health Organization

# CHAPTER ONE

# INTRODUCTION

## 1.0 Overview

This chapter covers the background, statement of the problem and objective of the study. It also presents the research questions, justification and scope of the study. Finally an operational definition of terms and a conceptual framework of the study are presented.

## Background of the Study

Health care is changing rapidly with the demand to create more collaborative working environments, keep pace with demographic pressures and meet complex care needs for diabetic patients in both public and private sectors.Nurses’ clinical competence in assessing patients would work towards meeting patient care expectations (Ham *et al.,* 2012). In addition, clinical nurses must make decisions about patient care based on the most up-to-date evidence and best practice, and should consider the assessment of diabetic patients’ lifestyles and any comorbidities (Benner *et al., 2*010), and appropriate timing of an intervention and patient referral (National Institute for Health and Care Excellence (NICE 2014).

Over the past few decades, both the number and prevalence of diabetes have steadily increased. According to (WHO, 2016), diabetes is one of the four priority’s Non Communicable Diseases (NCD) and has become an important public health problem. Globally an estimated 422 million adults were living with diabetes in 2014 compared to 108 million people in 1980.This indicates a rise from 4.7% in 1980 to 8.5% currently in the adult population (WHO,2016).

In 2012 diabetes caused 1.5 million deaths by the increased risks of cardiovascular diseases and other complications. Diabetes of all types can cause multi organ complications to include heart attack, kidney failure, leg amputation, vision loss and nerve damage. Poorly controlled diabetes in pregnancy increases the risks of fetal death. Economically, people with diabetes, their families and the health sector system bear huge economic losses, contributed by costs related to treatment of diabetic complications such as retinopathy, nephropathy and hospitalizations (WHO,2016).

Clinical competence of practicing nurses is important in maintaining professional standards, identifying areas of professional development and education needs of the nurses, and ensuring that nurse competencies are put to the best and possible use in patient care when assessing diabetic patients. Clinical competence includes knowledge,attitude and practice of the nurse in assessment of diabetic patients (WHO, 2014).

Nursing clinical assessment is a systematic and continuous collection, organization, validation and documentation of patient information (Berman, 2010). It is the process by which the nurse and patient together identify needs and concerns, and it is seen as the cornerstone of individualized care, a way in which the uniqueness of each patient can be recognized and considered in the care process (Berman *et al.,* 2010). Berman continues to say that it is a deliberate and interactive process that underpins every aspect of nursing care to patients at risk of developing complications from a given disease condition.

Alfaro (2014) argues that nursing clinical competency is an integral component of the nurse’s role and responsibility, while providing safe and planned care to assigned patients. Expertise in clinical patient assessment comes from using a systematic approach, regular practice and receiving feedback on completing nursing clinical assessments (Alfaro, 2014).

According to (Berman *et al.,* (2010), patient clinical assessment is highly interdependent with the nurse’s knowledge of commonly occurring health challenges as far as the nurses’ clinical competency in assessing diabetic patients is concerned. Berman (2010) further asserts that, if assessment proves to be challenging it is important to analyze whether the source of the difficulty rests with assessment or clinical competency related to commonly occurring health challenges (Berman, 2010).

Nurses’ clinical competence with regard to diabetic patient assessment should ensure that the nurses demonstrate clinical knowledge, reasoning and skills in diabetic nursing without any assistance or direct supervision (Munroe *et al.,*2013).

Patients with diabetes frequently attend clinics or visit the hospital to consult their healthcare practitioners, either specifically for diabetes-related issues, for complications of their chronic illness, or for unrelated problems. They may see their consultants, practice nurse, hospital diabetologist, diabetes specialist nurse, dietician and many others, from time to time. Each visit can be viewed as an opportunity to assess and improve the patient's understanding of their illness, and their ability to control the disease (ADA,2015). Dunkley (2014) states that ADA guideline recommendations on intervention content and delivery are significantly associated with improved glycemic control. Healthcare providers and nurses need to adhere to specific clinical diabetes guidelines when caring for these patients in the hospital setting (ADA, 2015).

The aim of assessing diabetic paatients is to educate the patient and enable them to monitor and manage their diabetes as well as possible.To assess any problems in glycaemic control and address them to improve, detect any complications of diabetes and treat them as appropriate.To educate and reinforce healthy lifestyle advice and assess the patient's overall health and treat any associated or coincidental illness, physical or mental.This aims at the provision of support and advice to the patient on how to cope with living with a chronic illness and how they can best alter their lifestyle to maintain their health (Dunkley,2014).

## 1.2 Statement of the Problem

According to Howlin & Benner (2010),competent nursing clinical assessment for diabetic patients is part of a day to day clinical practice. Clinical competence, timely and comprehensive patient assessment provides the foundation to determining the plan of care for diabetic patients (Howlin, 2010).

Benner (2010) denoted that clinical competence in nursing assessment of diabetic patients is critical in the prevention of diabetic complications. Nurses play a key role to identify diabetic patients at risk and intervene at an earlier stage and improve outcome for patients with diabetes mellitus (WHO, 2010).

In Kisumu County (Kenya), there is a rise in the number of patients with diabetes mellitus accounting to 2% of deaths (WHO,2012). Limited studies have been done on clinical competence for nurses on assessing diabetic patients.

Therefore, it is against this background that the study aims at determining the clinical competence of nurses in assessment of diabetic patients in selected hospitals in Kisumu County.

## 1.3 Main Objective

The main objective of this study was to determine the nurse’clinical competence in assessment of diabetic patients in selected hospitals in Kisumu County.

## 1.4 Specific Objectives

The specific objectives of this study were:

1. To assess nurses’ knowledge on the nature and scope of diabetic complications in diabetic patients
2. To determine the nurses’ clinical competence in assessment of diabetic patients
3. To examine factors influencing nurses’ competence in the clinical assessment of diabetic patients.

## 1.5 Research Questions

The study was guided by the following research questions.

1. What is the nurses’ knowledge on the nature and scope of diabetic complications in diabetic patients?
2. Are the nurses competent in the use of the nursing clinical assessments for the prevention of diabetic complications
3. What are the factors, influencing nurses’competence in clinical assessments of diabetic patients?

## 1.6 Justification of the Study

Limited studies are available on nurses’ clinical competence on assessment of diabetic patients.Previous studies done have captured on prevalence, factors and prevention of diabetes mellitus, and none has been done on nursing clinical competencies.

The results from the study will assist in improving the clinical competence of nurses in assessment of diabetic patients, which will be translated to improving diabetic patient outcomes by reducing the length of stay of patients in the hospital and reduce health care costs in the treatment of diabetic patients. The results from this study will contribute to the body of knowledge on nursing clinical assessment competencies in the care of diabetic patients.

The study results will be used to improve protocols, clinical pathways and clear guidelines on nursing clinical competence in assessing diabetic patients to aid in the prevention of diabetic complications. Finally, the study results will also be used by policy makers to change policies and framework to support nursing services in the care of diabetic patients globally.

## 1.7 Scope of the Study

The study was conducted in Kisumu County. Nurses working in the diabetic clinics, medical and surgical wards in the sampled hospitals were included in the study. The study focused on nurses’clinical competence in assessment of diabetic patients in selected hospitals in Kisumu County.

## 1.8 Limitations of the Study

The study design was cross sectional, sample size was small and purposive sampling was used to pick the study area and the hospitals limiting the generalization of results of this study.

## 1.9 Operational Definition of Terms

**Assessment:** A key component of nursing practice, required for planning and provision of patient and family centered care. In this study it is the measurement of knowledge of nurses in the assessment of diabetic patients regarding prevention of diabetic complications such as hypoglycemia and hyperglycemia

**Competence:** “The state of having the knowledge, judgment, skills, energy, experience and motivation required to respond adequately to the demands of one's professional responsibilities

**Clinical Competence:** This is a mix of skills, knowledge, attitudes and abilities to perform acceptably those duties directly related to patient care,in a specific context for example the care of diabetic patients to promote, maintain and restore health of patients.

**Diabetic Complication:** The outcomes of poorly controlled diabetes as a disease such as hypoglycemia, hyperglycemia, sexual dysfunctions, retinopathies, macro vascular and micro vascular complications, foot ulcers and diabetic ketoacidosis.

**Diabetic Ketoacidosis:** A complication of diabetes mellitus characterized by hyperglycemia, ketosis and metabolic acidosis. In this study it means the result of poor sugar control in the management of diabetes mellitus.

**Diabetes Mellitus:** is a group of metabolic diseases in which there are high blood sugar levels over a prolonged period. Symptoms of high blood sugar include frequent urination, increased thirst, and increased hunger.

**Diabetic Patients**: Patients who have the disease itself as characterized by high blood sugar levels or patients diagnosed with diabetes mellitus and having regular check up with the doctor.

**Glucose Control:** The maintenance of glucose level in the blood to as near normal as possible where the normal blood sugar level is 200mg/dl.

**Hyperglycemia**: An increase in blood sugar above normal blood sugar level in the blood more than 200mg/dl.

**Hypoglycemia:** A reduction below normal in the blood glucose level. It is an abnormally low blood glucose concentration characterized by sweating, hunger, dizziness, confusion and coma**.** It refers to a low blood sugar level less than 60mg/dl in blood.

**Insulin Derivatives**: Drugs used for the treatment of diabetes mellitus type 1 and 2 in form of injection.

**Nursing Assessment:** Comprehensive nursing assessment including patient history, general appearance, physical examination, vital signs and investigations completed at the time of admission. In this study it applies to what the nurses are able to do to the patients in the prevention of diabetic complications using the knowledge and skills gained during their training and practice as registered nurses.

**Registered Nurse:** This is a self regulated health care professional who has undergone a prescribed school of nursing ,certified and recognized by the nursing council of Kenya.This nurse works autonomously and in collaboration with others to enable individuals, families, communities, groups and populations to achive optimal levels of health.

**Side Effects:** These are secondary (usually undesirable or unwanted) effects of medicines given to patients.

**Treatment:** It is a mode of dealing with a patients’ disease process with specific medical or surgical intervention.

## 1.10 Conceptual Framework of the study

This conceptual framework shown below maps out key dimensions of nurses’ clinical competence in assessment of diabetic patients.The framework was adopted from WHO 2015 framework and guidelines on diabetes care and modified by the researcher to suit the current study. This framework has a number of domains including nurses’ knowledge,diabetic clinical assessments and factors influencing clinical competence of the nurses with clinical competence as the outcome.The framework was applied to guide data collection, organization and analysis.

**Independent Variable**  **Dependent Variable**

**Nurses Knowledge:**

* Diabetes Mellitus
* Nature and scope of diabetes
* Diabetic Complications

Nurses’ Clinical Competence

**Factors influencing clinical competence:**

* Experience
* education level
* Age
* Work shift
* Nurse specialization/CPD
* Patient work load
* Nurse motivation/satisfaction
* Effective leadership/management

**Diabetic clinical assessments:**

* Eye
* Urine
* Renal system
* Nutrition
* Blood sugar
* Diabetic Foot
* Reproductive system
* Cardiovascular system
* Neuro system
* Diabetic complication risk

**Figure 1.1 Conceptual Framework on Clinical Competence in assessing Diabetic patients**

**Source: Researcher, 2018**

# CHAPTER TWO

# LITERATURE REVIEW

## 2.0 Overview

This chapter presents the literature related to the background of diabetes mellitus, complications and the nurses’ competence required for care of a patient with diabetes. It further presents the nurses knowledge on nature and scope of diabetes mellitus and its complications, the nurses’ clinical competence in the clinical assessment of diabetic patients and the factors influencing nurses’ competence in the clinical assessment of diabetic patients and finally the gaps in the literature review are presented.

Diabetes is a group of metabolic diseases characterized by hyperglycaemia resulting from defects in insulin secretion, insulin action, or both. The chronic hyperglycaemia of diabetes is associated with long-term damage, dysfunction, and failure of different organs, especially the eyes, kidneys, nerves, heart, and blood vessels (ADA, 2015).

Diabetes is a chronic, life-long condition that requires careful monitoring and control. Without proper management it can lead to very high blood sugar levels which can result in long term damage to various organs and tissues (complications). Long-term complications of diabetes are divided into microvascular and macrovascular (Lewis, 2011).

Microvascular complications are; Eye disease (diabetic retinopathy), damage to the eyes with potential loss of vision, Kidney disease (diabetic nephropathy), damage to the kidney leading to renal failure, Nerve disease (diabetic neuropathy), damage to the nerves leading to loss of feeling with risk of foot ulcers, amputations, Charcot joints and impotence. Loss of feeling is a particular risk because it can allow foot injuries to escape notice and treatment, leading to major infections and amputation. Macrovascular complications include cerebrovascular disease (affects heart and blood vessels) such as heart attacks, strokes and insufficiency in blood flow to the legs (WHO,2012).

Nurses’clinical competence required for the care of a diabetic patient follows policies and guidelines by each member of nursing teams’ level of competence.This includes : a registered nurse who has undertaken a prescribed training from the school of nursing ,accredited, certified and licensed as per the nursing council regulations and guidelines.The registered nurse has the knowledge and skills on the care of a diabetic patient, where communication, social, technical and behavioural skills are a required.

The nurse should be able to provide health education to the patients, document care provided to this patients,administer medications to the patient and ensure that the clinical assessments are well done on diabetic patients to identify any risk or complication that can occur. The nurse should be at the position of making a clinical judgement, should have clinical reasoning skills and this should be combined with ongoing assessment to include changes on trajectory of glucose measures, the severity of the illness, nutritional status, or concomitant medications that might affect glucose levels (ADA,2015).

## 2.1 Nurses’ Knowledge on Nature and Scope of Diabetes Mellitus and its Complications

Diabetes mellitus is a chronic systemic disease that alters carbohydrate, fat, and protein metabolism; it’s the most common endocrine disorder and the third leading cause of death in the United States (WHO, 2016). Four general classifications are recognized: Prediabetes, type 1 diabetes, type 2 diabetes and gestational diabetes. Prediabetes can occur when the fasting blood glucose is greater than 100 mg/dL and less than 126 mg/dL, or postprandial blood glucose is greater than 140mg/dL and less than 200 mg/dL. Type 1 diabetes accounts for 90% of diabetic patients as per the WHO (2011) statistics.

Gestational diabetes mellitus causes glucose intolerance during pregnancy; it usually disappears after delivery but may develop into type 1 or type 2 diabetes. Other types of diabetes mellitus can be linked to either a disorder (such as an endocrinopathy, a genetic syndrome, an insulin receptor disorder, or an infection) or to the use of a drug or a chemical (such as a corticosteroid, epinephrine, frusemide, glucagon, lithium, or phenytoin) (WHO, 2011). Complications associated with diabetes Mellitus include both macro and micro vascular changes (WHO, 2011).

Diabetes mellitus is a chronic disorder, characterized by raised glucose levels in blood (hyperglycemia) and urine (glycosuria) (Lewis, 2011). The cause may be inherited and/or acquired deficiency of insulin production by the pancreas, or insulin resistance, where the insulin produced is ineffective. Increased blood glucose concentrations can cause structural damage, particularly to blood vessels and nerves (Lewis, 2011). Micro vascular complications of diabetes (diabetic retinopathy, nephropathy and neuropathy) bring problems of blindness, kidney failure, foot ulcers, gangrene and erectile impotence. However, Lewis (2011) continues to say that heart disease accounts for around 50% of deaths of people with diabetes. The prevalence of diabetes is increasing rapidly worldwide with notable racial and ethnic differences (WHO, 2014).

In Sub-Saharan Africa and Kenya, diabetes is the number four contributor in the cause of acute complications (WHO, 2010). In a study done in Kenyatta National Hospital (KNH) in 2005, 30% of patients who died within 48 hours of admission were from acute diabetic complications. Patients who had developed foot ulcers were from the many tertiary clinics in Kenya due to hyperglycemic control, infections, hypertension and dyslipidemia (WHO, 2010).

A study assessing DM-related knowledge among registered nurses through a questionnaire addressing nine key areas found overall knowledge lacking, with a mean score of 48.5%, and a score of 47.8% for knowledge of hypoglycemia and 51.3% for knowledge of chronic complications of DM (Abduelkarem & El-Shareif, 2013).

Health care professionals treating patients with DM have limited understanding, knowledge, and resources to adequately care for and educate patients with DM and improve self-management (Holt et al., 2013; Korytkowski, Koerbel, Kotagal, Donihi, & DiNardo, 2014).

Young (2011) asserted that registered nurses have knowledge deficits on diabetes care in terms of pathophysiology, medication management, nursing care, hyperglycemia outcomes, and current guidelines related to managing diabetic patients in the hospital.

Modic 2014 in his study stated that, recent trends in caring for patients with DM in the hospital have focused on blood glucose targets and insulin management. These trends require registered nurses to stay abreast of new knowledge and gain competency that translates into evidence-based practice changes (Modic *et al.,* 2014).

### 2.1.1 Diabetic Ketoacidosis (DKA)

DKA is a life threatening condition with characteristics of insulin deficiency and increased hormone; cortisol, glucagon, catecholamines, and growth hormones. The insulin deficiency and increased hormones lead to electrolyte imbalances, dehydration, hyperglycemia and ketosis (Gosmanov *et al.,* 2014).

Patients with severe DKA have a much higher mortality rate and risk of complications. This is an extreme increase in the hyperglycemic state. It is an increase in the mobilization of fat and protein as energy sources (WHO, 2013). Metabolism of fat results in the production of fatty acids which are then converted into ketone bodies. An increase in ketone bodies precipitates the state of acidosis. This predominantly occurs in type 1 diabetes (WHO, 2013).

Clinical manifestations include abdominal pains, anorexia, vomiting, diarrhea, nausea, the skin looks flushed, pulse rate is weak and patient will have tachycardia. Respirations are initially deep and rapid; leading to Kussmaul respirations, breath odor is fruity, acetones and urine output is increased (Mbugua, 2005).

According to Gosmanov (2014),the diagnostic criteria for DKA includes blood glucose greater than 250mg/dl, arterial PH less than 18mEql and positive serum and urine ketones. Most of the patients present to the emergency room with symptoms of hyperglycemia and upon physical examination, protocol for hyperglycemic crisis should be taken. However, Gosmanov 2014 continues to say that, the nurses should be knowledgeable in the management of hyperglycemic crisis per protocol, which is a simple four step process that entails blood sample collection for metabolic profile before administration of intravenous fluids, after blood sample collection an infusion of saline follows, the nurse ensures that the potassium levels are greater than 3.3mEq/l before initiation of insulin therapy and supplement potassium if needed and finally an initiation of insulin therapy once the steps have been followed up (Gosmanov *et al.,* 2014).

World Health Organization 2014 guidelines states that many diabetics in Kenya are diagnosed with irreversible complications; likewise half of diabetic mellitus patients in the UK have complications at diagnosis. In Africa infection and acute metabolic complications are the most common causes of death compared to cardiovascular/renal complications in Western countries (WHO, 2014).

Diabetic ketoacidosis (DKA) accounted for 8% of diabetic admissions in a study at KNH, 30% of patients died within 48 hours of presentation. Foot ulcers are seen frequently at many tertiary clinics in Kenya and are associated with poor glycemic control, infection, hypertension and dyslipidemia (WHO, 2012).

### 2.1.2 Hyperglycemic Hyperosmolar Non ketotic Syndrome

This occurs primarily in older adults with type 2 diabetes, where insulin production is adequate to prevent the breakdown of fat for cellular function, but severe hyperglycemia exists (Mbugua,2005). Severe electrolyte imbalance exists in the absence of the acidotic state as characterized by severe hyperglycemia (values greater than 600mg/dl) (Mbugua, 2005).

Mbugua 2005 denoted that this condition manifests as more severe neurologic symptoms will be due to increased osmolality and high blood glucose level, skin will be warm, dry and flushed, pulse rate will show tachycardia, on respirations this will show tachypnea, and the urine output will be increased. Mbugua (2005) continues to say that there will be an electrolyte imbalance as acidosis will develop.

### 2.1.3 Hypoglycemia

This is a complication that occurs as a result of too much insulin, or oral hypoglycemic agent. This also occurs due to little food, or excessive physical activity and when the blood glucose level drops to less than 3.3mmol/l (Wild, 2007).

According to Rachael (2009), the prevalence of hypoglycaemia from 1980 to 2002, shows a total of 1465 patients (8.8%) had at least 1 episode of hypoglycaemia. Of these patients, 1002 (68.5%) had 1 episode, 252 (18%) had 2 episodes, and 203 (13.5%) had 3 or more episodes. In a longitudinal cohort study done by Rachel; A *et al.,* (2009), a total of 16,667 elderly (mean age 65 years) patients with type 2 diabetes, 1465 patients (8.8%) had at least one hypoglycaemic episode of 1.26, two hypoglycaemic episodes of 1.80 and three or more episodes of 1.94. A study done by Wild (2007), on hypoglycaemia in known diabetic patients, revealed that fears would be curbed by having a blood glucose awareness training using the parameters of hypoglycaemia, length of time since the first insulin treatment, and the variability of insulin glucose levels. A hypoglycaemic reaction seems to be one of the major and acute complications of diabetes, when glycaemic control is not well achieved. Clinical practice by nurses in the prevention of diabetic complications plays a great role (Donnelly *et al.,* 2005). Donnelly 2005 said that ongoing education in the rapidly changing field of DM care must include current research, evidence based protocols, and competency assessments to increase professional nursing knowledge.

In a descriptive study by Modic *et al.,* (2014), RNs’ confidence, skill mastery, and knowledge of DM care was examined to identify knowledge gaps and was reexamined after 4 hours of education. Education was provided by two Certified Diabetes Educators (CDEs) based on a prior knowledge assessment and covered hyperglycemia, hypoglycemia, insulin therapy, and survival skills. The study looked at the relationship between level of knowledge and age, level of knowledge and education level or years of nursing experience difference in registered nurses knowledge level and self-rated confidence and skill mastery, and knowledge gained after 4 hours of education (Modic, 2014).

The results of the study showed a negative correlation between the age of the registered nurse and knowledge, with assessment scores decreasing as the age of the registered nurse increased. When controlling for age, there was no correlation between level of knowledge and education level and years of nursing experience. Self-rated confidence and skill mastery of the registered nurse did not have a correlation with DM care knowledge. The education provided by the Care Diabetic Educators did increase the overall knowledge of DM care, resulting in higher scores on a post test (Modic, 2014). Patient education is one of the nurses’ clinical competencies of patients with diabetes mellitus. Patient education on self-care in view of the disease process is useful in diabetic complication prevention, and the likely outcome from the interventions given to patients by the nurses (WHO, 2012).

According to Swedish National Board of Health and Welfare guideline a prerequisite to reaching the stated goals is competent nursing assessment and sufficient self-care mediated by well-educated health care personnel. The patient’s education in self-care is central to diabetes care and the diabetes nurse is expected to play an important role in this work of supporting the patient in acquiring knowledge and confidence in order to reach the goals for metabolic control declared in the national guidelines (Socialstyrelsen, 1999). County nurses educated in diabetes care and working in primary health care are often responsible for providing diabetes care quite independently of the general practitioner, for instance when making adjustments to tablets and insulin doses. This kind of organization has been promoted in several policy documents and research reports for the high quality of the care it provides (NICE,2014).

## 2.2 Asessment of Clinical Competence

Skills and abilities that the nurse requires to carry out an effective assessment include communication skills, empathy and nonjudgmental approachability to make inferences. Nurses prioritize and decision-make, psychomotor skills of inspection, palpation, percussion, and auscultation are also used (Maina, 2011).

Factors that impact the quality and thoroughness of an assessment include; nurse’s knowledge and competency, presenting health problem, concurrent health problems and stability of the patient, communication barriers and inability to communicate with patient due to patient’s cognitive limitations from past, current or concurrent health challenge, presence/absence of family/support, insufficient time and resources to carry out the assessment, finally patient discomfort, anxiety and fears (ADA,2016).

Wamai (2009) continues to say that competent nurses often ensure that diabetic patients have regular assessments at each regular visit. Patients need encouragement to talk about any problems and questions they might have, changes in diet, medication monitoring, and exercise should be evaluated. Centers of Disease Control prevention 2011,diabetes fact states that all self-monitoring results are re-evaluated and a physical examination is performed to include, an evaluation of weight, blood pressure, eyes and vision, kidney function, feet and skin care, where diabetes education should be a continuous process.

In a study done by Ham (2004), in the United Kingdom (UK) on nurses’ competence while taking care of patients who are at risk of deterioration, recommended that a specific skill set for practicing nurses reflected the nature of nursing practice and the specific requirements of nurses to work in this field. The skills were primarily task focused and reflected the acuity of patients being nursed, such as possession of competency in arterial blood gas sampling, venipuncture, venous cannulation and interpretation of the electrocardiogram. In addition, Ham (2004), found that competency in physical examination skills and interpretation of results was considered an important skill for senior nurses.

A study done by Moghissi *et al.,* (2009), states that, the choice to control hyperglycemia in patients is insulin therapy, where a gap of knowledge competency was identified for nurses working in the hospital, thus need for patient assessment to improve the quality of care for hospitalized patients.

Gandhi *et al.,* (2007), did a study in Bangalore in South India within the intensive care unit that showed that the tight glucose control improved health outcomes thus, nursing clinical assessment and knowledge remains a key factor in nursing competency in the prevention of diabetic complications.

Nursing assessment in patients with diabetes is a frequent healthcare approach where, nurses attend to the patients due to diabetes related issues, for complications of their chronic illnesses, or unrelated health problems. Each visit can be viewed as an opportunity to assess and improve the patient’s understanding of their illness, and their ability to control the potential complications and prevent further development of diabetic complications (WHO 2015).

The clinical competence in nursing assessment of diabetic patients and complication prevention depends on areas of assessment relevant to the type of diabetes. Nursing clinical assessments that need to be talked of here include history taking, physical examination, investigations, nutrition, physical activity, risk factors and medications given to diabetic patients (WHO,2015).

A number of seminal studies during the late 1990’s established that, in-hospital decline in the patient’s clinical condition to a critical point, was generally preceded by a period of time when the physiological status of the patient was abnormal. This could be seen in the measurements of vital signs of respiratory rate, blood pressure, heart rate and temperature (Mc Quillan *et al.,* 1998; Mc Gloin *et al.,* 1999; Goldhill *et al.,* 1999). If physiological abnormalities are not recognised, corrected quickly or supported sufficiently, the patient’s condition may progress further to critical illness or death. However, the nurse is ideally placed to identify patients through nursing clinical assessment in the period preceding critical illness, and to intervene at an early stage preventing further decline (Higginson & Jones, 2009).

Changes in the patient’s physical condition result in haemodynamic instability as the critical bodily functions start to fail and may be detected through observation and recording of the patient’s physiological vital signs of respiratory rate, heart rate, blood pressure and temperature, which gradually become more abnormal with the progression of deterioration. Nurses therefore must acquire and develop skills to rapidly observe and assess the patient, interpret and evaluate the patient assessment and make sound clinical decisions based upon clinical judgement (Abdul,2013).

Assssment of a patient at risk of developing complications needs early identification of the risks involved, impending features, early diagnosis and treatment of the underlying cause, a detailed history essential for making the right diagnosis, clinical and laboratory monitoring of treatment is essential (Wilkinson, 2007).

Competencies of nursing clinical assessments in the prevention of diabetic complications would include; educating the patients and enabling them to monitor and manage their diabetes as well as possible (WHO, 2014). Assessing any problems in glycaemic control and addressing them to improve it, to detect any complications of diabetes and treat them as appropriate are part of the competencies required in glycaemic control (WHO, 2014).

Educating and reinforcing a healthy lifestyle advice, to assess the patient’s overall health and to treat any associated or coincidental illness, physical or mental and to support and provide advice to the patient on how to cope with a chronic illness. Finally institute strategies on how, they can best alter their lifestyle to maintain health and prevent diabetic complications (WHO, 2014).

### 2.2.1 Nutritional Assessment

Nutritional assessment is an important component of self-care management for diabetic patients.This is where diabetic patients are assessed towards the provision of all the essential food requirements, maintenance of an ideal weight, decreased lipid levels and the achievement of blood glucose to as near normal as possible. Therefore the nurse does a 24 hour dietary recall for the patient (Rachel, 2009). Nursing clinical competency on nutrition in the current study entails; the patient's current level of physical activity and if this can be improved if thought necessary, whether there any local physical activity programmes in which they could be enrolled in,whether the patient received adequate education in respect of their diabetes, both in their and in your view if not be initiated and the nurse to establish whether the patient would like to receive more advice on self-management of their diabetes and finally the nurse to ensure the patients are enrolled into a local diabetes education delivery programme if available (Rachel,2009).

Major assessments to be done for the patient include monitoring of lifestyle changes, anthropometric measurements to include; blood pressure, height, weight, Body Mass Index, waist Circumference. Urine testing for sugar and ketones, blood tests for sugar levels, urea electrolytes and creatinine levels, lipid levels, High Density Lipoproteins and the Low Density Lipoproteins and plasma proteins (Rachel,2009).

According to Berman 2010, nurses clinical competence assessments are continuous on admission, hospitalization, and on clinic attendance follow up for patients with diabetes (Berman, 2010). Nursing clinical competence to nutritional assessment for diabetic patients is that, medical nutrition therapy for people with diabetes should be individualized, with consideration given to each individual’s usual food and eating habits, metabolic profile, treatment goals, and desired outcomes. Ongoing nutrition self-management education and care need to be available for individuals with diabetes. In light of the existence of complexities of nutrition issues in diabetes, a qualified dietician knowledgeable and skilled in such issues is needed (WHO, 2010).Therefore the competencies required by the nurses include knowledge of the diet required for a diabetic patient to include quantity and quality, be able to demonstrate and reinforce on self care management in terms of nutrition and make a follow up (WHO,2017).

### 2.2.2 Self-care Management Assessment

Self-care management is under health promotion where patients need to take care of themselves. This approach entails dietary issues, exercise, weight reduction, sedentary lifestyle management, and patient education in diabetic complication prevention. Patient education of persons with diabetes is one of the primary tasks of their health care teams, and the goal of this process is to achieve and maintain the patients’ independence, competence and self-efficacy in managing their illness (Berman *et al.,*2010).

Regarding dietary regimen, the nursing evaluation assessed whether the patient understands the importance of an appropriate diabetes-tailored healthy diet. It also includes the impact of the type of foodstuffs, and the manner of food preparation on blood sugar levels. On assessing self-care management of patients with DM, the nurse should assess whether the patient understands the importance of therapeutic physical exercise and the principles of harmonization of physical activity, diet and blood sugar levels (WHO, 2016).

Nurses’ clinical competence to self-care management involves both major and important components of self-care management to include; stress reduction, nutrition management, complication assessment, medication reviews and compliance. Therefore nurses play a major role in educating diabetic patients given their expertise and competency to reduce morbidity and mortality rates (ADA, 2014).

Registered nurses play a critical role in caring for patients with DM and recognizing the potentially serious complications of the disease, if it is not managed appropriately. This knowledge assessment of inpatient care increases the knowledge level of registered nurses in DM care, will decrease hypoglycemia and increase the quality and safety of care for patients (ADA, 2014).

According to ADA, 2014 the nurses clinical competence is to evaluate whether an intervention which focuses on patients’ personal understanding of their illness is more effective than is conventional diabetes care with regard to metabolic control, well-being and treatment satisfaction in a group of patients with either diabetes type 1 or type 2.

### 2.2.3 Vascular Assessment

Diabetes Mellitus is associated with a variety of complications which may result in disability or premature death. These complications can be broadly classified as micro or macro vascular. Micro vascular damage manifests itself as retinopathy, nephropathy and neuropathy. Improvements in glycemic control can reduce the risk of this damage. The macro vascular damage seen in persons with diabetes manifests itself as coronary heart disease, cerebrovascular disease or peripheral vascular disease (Funnel & Anderson, 2014).

Funnel & Anderson 2014 continued to say that, the aim of diabetes complication nursing assessment current practices emphasizes on early detection and prompt treatment of diabetic complications, to reduce much of the personal and economic burden associated with advanced complications.Nurses should ensure that patients with diabetes undergo a regular complication assessment that should continue every one to two years and should be followed up in the general practice setting (Majra, 2009). People with diabetes need regular review for the presence of macro vascular disease, as the risk of macro vascular disease is 2-5 times higher. Predisposing risk factors include hyperglycemia, hyperinsulinaemia, insulin resistance, smoking, obesity, dyslipidemia, and hypertension and platelet dysfunction (Alfaro, 2014).

Nursing clinical assessment includes; a record history of cardiovascular events cerebrovascular disease, record family history of vascular disease, history of vascular investigation and smoking history. A physical examination is done by listening for carotid bruit and palpating of pedal pulses, measure of blood pressure after a minimum of 5 minutes sitting and an order of laboratory investigations to include; urine albumin/creatinine ratio, serum, creatinine/urea/electrolytes creatinine/ urea/electrolytes and lipid profile. Finally a consideration of electrocardiogram, echocardiogram and stress echocardiogram will be done as part of the assessment process (Crouch, 2005).

### 2.2.4 Risk Assessment

This should be done upon attending clinic, on admission and subsequent visits for proper glycaemic control. Nursing assessments to be done include; risk factors for the development of complications, younger age at onset, length of diabetes, poor glycemic control, and family history of complications, exercise, lipid status, dietary patterns, blood pressure and its control, history of hypertension, weight gain or weight loss, smoking status and how to control it, and dyslipidemia (Majra,2009). However Majra, 2009 continues to say that nurses contribute a lot to advising patients with diabetes as part of the risk assessment where, persons with diabetes should be encouraged to lead a normal life and participate in sports and exercise programs. Generally they should not be excluded from physical activities or games, unless there are complications and on the advice of a physician.

The main risk when exercising is hypoglycaemia, therefore blood glucose should be checked before exertion, and if appropriate, medication dosage may need to be reduced before exercise, or the individual may need to take an extra carbohydrate snack. Before starting any exercise program, the health provider should do a thorough physical examination to find out whether or not it is safe for the patient to exercise (WHO,2014).

Nursing core competency in the prevention of hypoglycemia includes; education of patients and their families about the prevention, recognition and treatment of hypoglycemia ,health care workers, particularly emergency medical personnel, should be familiar with the recognition and treatment of hypoglycemia and facilitate prompt assessment, patients receiving insulin treatment should wear or carry appropriate identification and finally blood glucose targets must be individualized for each patient (WHO,2014).

### 2.2.5 Eye Assessment

People with diabetes need regular reviews looking for the presence of retinopathy, maculopathy, cataract or glaucoma. Timely photocoagulation significantly reduces visual loss in diabetic patients. Nursing Assessment part entails history taking and doing a physical examination, where history of known eye disease and any laser treatment or surgery is recorded and a measure of visual acuity using snellen chart, a fundal examination through dilated pupils by trained observer (dialectologist, specialist nurse, ophthalmologist, or optometrist) are done and documentation of findings done for action (Lewis, 2011).

Ophthalmic nurses are also critical elements in health-care systems because they can help to deliver up to date ophthalmic knowledge and contribute to general physicians, academically. Additionally, they may be able to assist patients who suffer from blindness or loss of vision, to find national organizations that provide services and education. They are able to be a great assistance in referring patients that need subspecialty services and subsequently, contribute to saving health-care expenditures by let the patients to receive proper management. These nurses could play a significant role in the process of teaching people, providing proper diagnoses, administration, and management of ocular problems (WHO, 2014).

### 2.2.6 Nephrology Assessment

People with diabetes need regular review looking for the presence of renal disease, or markers such as micro albuminuria. The prevalence in type 2 diabetes is not well defined, and rates vary between 3 and 16% according to the American Diabetic Association (ADA, 2011). Micro albuminuria can be detected years before standard reagent strips can measure proteinuria. People with Micro albuminuria are at greater risk of developing progressive nephropathy. Micro albuminuria is also an independent marker for risk of cardiovascular disease (ADA, 2011).

Nursing assessment of renal disease includes; history of any other renal disease, doing a focused assessment of the renal system, vital signs more so a measure of blood pressure after a minimum of 5 minutes sitting and other laboratory investigations to include: performing urinalysis for protein, assess urinary albumin by spot urine albumin creatinine ratio or by timed collection. Abnormal screening values should be confirmed by repeated sampling to demonstrate persistent micro albuminuria (Funnel, 2014).

Further assessment involves a consideration of urine culture if suspected infection, a measure of serum creatinine, and full blood count (Funnel & Anderson, 2014).

Nursing competency to renal disease assessment is to have tighter blood pressure and glycemic control needed in patients at risk of developing diabetic nephropathy. Vigorous treatment of clinical nephropathy may delay the development of end-stage renal disease. One of the highest priorities at the present time is the education of patients and their physicians about the potential for early detection and prevention of diabetic kidney disease. The likelihood of success in preventing and reducing the consequences of diabetic kidney disease will depend on the availability of resources to implement educational programs and to monitor them continuously (WHO, 2014).

### 2.2.7 Diabetic Foot Assessment

Nursing clinical assessment involves arecord of pain, numbness or paraesthesia, claudication or rest pain, surgery for peripheral vascular disease, previous vascular or neuropathic ulceration. Amputation examination of the feet for any high-risk characteristics such as corns and callus, boney prominences, poor perfusion of pedal pulses, where a doppler ultrasound is done, if pulses cannot be palpated, testing of ankle reflexes, sensation test using a monofilament and finally assessment of footwear and general foot care (Berman *et al.,* 2010).

Diabetes-related foot complications affect the quality of life for patients and present a growing burden for health services. Many foot ulcers and amputations could be prevented using optimum care and monitoring as suggested by recent guidelines and literature (ADA, 2014).

The competency of nursing clinical assessment in diabetic foot assessment is to educate diabetic patients on the need to use adequate, appropriate foot wear to prevent the risk of ulceration and amputation, therefore specially designed therapeutic footwear or ‘special shoes’ should be recommended as a preventive measure. Issues around footwear for people with diabetes have received little research attention; what exists highlights the complexity of special shoe provision and wears (ADA, 2014).

Similarly, studies of the diabetes experience and self-care behaviors have not tended to include issues arising from the prescription of footwear (WHO, 2012). For prevention or healing of foot ulceration, continuous use of therapeutic footwear is advised for the prevention of foot complications in diabetic patients, which is a major role done by the nurses in clinical nursing assessment (ADA, 2014).

According to ADA, 2014 patient education is the most important contribution to the prevention of foot lesions in diabetes and nurses should be more competent in the provision of the required educational competence. The first objective should be to increase the knowledge of all those who care for diabetic patients concerning the dangers inherent in the development of diabetic foot lesions and the different skills needed to examine feet and to treat lesions.

Another goal is to establish an educational program for patients at special risk of developing foot ulcers. The program should include: regular attendance by patients for the reinforcement of knowledge and motivation for continuing to care for their feet; formal teaching sessions to explain the reasons for the vulnerability of the diabetic foot, and the importance of everyday matters such as suitable footwear and foot hygiene; the provision of appropriate written and/or audiovisual material (Berman *et al.,*2010).

Therefore nursing clinical competence ensures that education of patients has to be centered on appropriate skills aimed at preventing foot lesions. Patients should learn: not to walk bare-footed; to examine shoes daily and look for foreign bodies; to avoid “bathroom surgery” (no scissors, no razor blades, and no chemical skin loosener for hyperkeratosis); to treat fungus disease and minor cuts early; to use a mirror to observe the plantar surface of the foot; to test the degree to which pain sensation has been lost; and to prevent burns (no hot water or electric heaters) (ADA, 2014).

### 2.2.8 Autonomic Neuropathy Assessment

Nursing assessment involves history taking, recording of the signs and symptoms and doing a physical examination. A record of signs and symptoms of autonomic neuropathy, gustatory sweating, vomiting undigested food several hours after eating, incomplete bladder emptying, and altered bowel habits. If the mentioned signs and symptoms are present consider further testing including lying and standing blood pressure (Alfaro, 2014).

According to Alfaro 2014, the highest priority at present is the education of patients and their physicians about the potential for detection and treatment of early neuropathy. Large scale studies have shown that glycemic control is beneficial in reducing the frequency of progression of neuropathy.

## 2.3 Factors Influencing the Nurses’ Clinical Competence in Assessment of Diabetic Patients

To ensure the quality of care and provide the safety of diabetic patients, clinical competence of nurses seems necessary (Moghissi, 2009).

According to Muir 2006 clinical competence of nurses working in the diabetic care areas is influenced by many factors including age, educational level, years of experience, work shift, area of specialty in nursing, number of diabetes patients attended to per month, updates on diabetes care, presence of diabetes in self, immediate family, or a friend, nursing information sources in view of diabetes and obstacles to learning. This further includes intervention efficacy and aids, appropriateness of intervention, preferred educational method, and personal computer information access have significant effects on the knowledge scores of the nurses (Modic *et al.,* 2014).

In a study done at the Kenyatta National Hospital, on clinical competence care of diabetes by health care workers, adherence to diabetes guidelines by healthcare professionals at the hospital was poor, and this could worsen during patients’ subsequent visits. Poor adherence to annual risk assessment was also identified representing lost opportunity for early detection of preventable complications (Atieno *et al.,* 2014).

The findings found a gap that called for the health workers competences, availability and reasons for non-adherence to processes to be investigated (Atieno *et al.,* 2014).

Modic (2014 )continued to state that as the number of people with diabetes rises, so too as the number of nurses involved in delivering diabetes care and the variety of roles and titles within the specialty.

Every nurse is responsible for developing their own portfolio of evidence that demonstrates each competency. Forms of evidence that can be used to demonstrate competency include: case histories, self-appraisal via a reflective diary, 360-degree feedback, verification of practice and structured observation of practice (Benner, 2010).

Benner 2010 denoted that when gathering evidence to prove competency, it is important that nurses understand what each of the competencies is asking of them, review any existing work that could demonstrate their competency, identify whether the existing evidence is appropriate (e.g. if a nurse attends a study day to prepare to perform a particular intervention, but has not practiced the skill in a clinical setting), the certificate of attendance is not evidence of competency. The nurse should consider making arrangements for supervised practice. However, Benner continued to say that if the nurse has undergone training and has evidence of supervised practice and performs the care on a regular basis, the evidence should be sufficient to demonstrate competency (Benner, 2012).

Joint Commission on Accreditation of Healthcare Organizations (JCAHO) assesses competence of facility staff as a part of the accreditation process. To comply with standards related to staff competence, facilities must define the patient population served, the age and special needs groups within the patient population, and the staff members who deliver services to the patient population (Moghissi, 2009). Further, JCAHO clarifies that the hospital must assess competency of staff members, clearly addressing the special needs and behaviors of specific age groups of the patients whom they serve. Each facility has defined age groupings of the population it serves (Moghissi, 2009).

### 2.3.1 Provider Socio-Demographic Variables

Age-specific considerations must be combined with other individual differences for example nurses who are aged and are mature tackle issues in a different way compared to the young (WHO,2016).

An older adult who has a chronic disease like diabetes may be affected by age-specific factors such as denial, extreme secrecy, a compromised immune system, and erectile and vaginal changes associated with aging, which the old nurses are able to pick as compared to young nurses who have no experience (WHO, 2016).

The most important thing to remember about individual differences is to avoid stereotyping or assuming that a patient practices certain behaviors or espouses certain values and preferences based upon any category or combination of categories into which that patient appears to fit. Nevertheless, to practice with cultural competence, the nurse learns typical behaviors, values, and preferences associated with various groups. The nurse uses this information to assess and validate whether and how those norms apply to a specific patient. Even age group norms require validation, particularly among older adults (WHO, 2016).

Therefore the competent nurse uses knowledge of typical characteristics and expectations as a guide and a basis for further assessment and validation, not as a basis for making assumptions (Lyons, 2014).

### 2.3.2 Level of Education

The quality of healthcare services mainly depends on practitioners’ knowledge and technical skills according to Benner 2010. These skills are gained through continuous education, updates, use of evidence based practice, and internet services through self-initiatives and this can also occur through staff development and career path (WHO, 2010).

Another study done in Sudan summary report for 2010 on assessment of type 2 diabetes mellitus management practice, revealed that frequency of documentation of diabetes process measures in public hospitals showed blood glucose tests (67.2%), HbA1c (22.9%); foot exam (14.1%); fundoscopy (9.2%); lipids profile (17.2%); urinalysis (15.6%); and RFT (29.4%). Patients reported excess of received diabetes care measures compared to what is documented. In the specialized diabetes center, the frequency of documentation of the previous measures was significantly higher (WHO, 2010).

### 2.3.3 Provider Motivation and Satisfaction

Nursing job satisfaction is very important in delivering high-quality services to patients. Some of these factors could influence their motivation and consequently job satisfaction. These factors include: pay, working environment, managerial leadership, organizational policies, co-workers, recognition, job security, job identity, and chances for promotion (Polit, 2012).

More and more qualified employees are leaving private hospitals as soon as they find a secure and well-paid job. High employee turnover causes many problems for operational managers. Most of the newly employed personnel do not have work experience. Therefore, the education supervisor or department head have to train them. Some employees of public hospitals work in a private hospital mostly in the afternoon and night shifts to cope with their living expenses. In such cases, the quality of their services will be decreased due to too much work. This in turn affects patient satisfaction. It also affects other staff’s motivation and satisfaction: The working environment affects employee satisfaction, quality of leadership and management affects employees’ motivation and satisfaction (Young, 2011).

### 2.3.4 Facilities’ Leadership and Management

Availability of both human and material resources affect the quality of healthcare services, like in patients with diabetes the presence of a blood sugar machine (accucheck), is necessary to improve blood glucose monitoring, and help in glycemic control. Most of the facilities within the county do have the equipment for blood sugar check and most of the patients are encouraged to have their own machines for the same and to aid in self-care management and for practitioners having good support in terms of collaboration and partnership development (Atieno *et al.,* 2014).

Effective management is an important enabler of quality from the perspective of providers, managers, policy-makers and payers. “Everything in the hospital is affected by the management. If people have good ideas for quality improvement, then the management should be good.This could be a good enhancer for quality care according to the guidelines on diabetic care (WHO, 2010).

# CHAPTER THREE

# RESEARCH METHODOLOGY

## 3.0 Overview

This chapter will cover the methodology used in the study. The research study design, study area, target population, sampling method, and procedures are described. Sample size calculation, inclusive criteria, exclusive criteria, development of research instruments, data collection tools and procedure are also outlined. Finally, there is a presentation on data analysis procedures and ethical considerations.

## 3.1 Research Design

The study set out to determine the nurses’clinical competence in assessment of diabetic patients in selected hospitals in Kisumu County. A descriptive cross sectional design that employed quantitave approach was used in the study. Data was collected from nurses on nurses’ knowledge on the nature and scope of diabetic complications, factors influencing the nurse’s competence in assessing diabetic patients and nurses’ competence in clinical assessment to prevent diabetic complications.

## 3.2 Study Area

The study was conducted in Kisumu County in western region of Kenya due to a rise in the prevalence of patients presenting with diabetic mellitus,the nurses working in those areas are not trained on diabetes management apart from diabetic updates given to nurses during seminars and conferences that are not regularly done. Staffing ratio in the study areas within the county is lean, especially in the clinics where one to two nurses manage the clinic on daily basis. Therefore the study was conducted was to determine the nurses’clinical competence in assessment of diabetic patients in selected hospitals in Kisumu County. Kisumu County is one of the 47 Counties in Kenya. It is located between latitudes 15o N and 45o S, longitudes 15o E and 34o E.

The County is bordered by Homa Bay and Kisii Counties to the South, Nandi County to the North East, Kericho County to the East, Vihiga County to the North West and Siaya County to the West. The County covers a total land area of 2086 km2 and another 567 km2 covered by water. Administratively it is divided into seven sub-counties namely: Kisumu Central, Kisumu East, Kisumu West, Seme, Nyando, Nyakach and Muhoroni. The names and boundaries of the sub-counties coincide with the political constituencies in the County. Kisumu County has nine major urban centres namely; Kisumu City (the County headquarters), Ahero, Muhoroni, Chemelil, Awasi, Katito, Maseno, Sondu, Kombewa and many other small market centres.

Economic resources of Kisumu are Agricultural, Fisheries and water. Main economic activities include subsistence farming, livestock keeping, fishing, rice farming, sugarcane farming, and small scale trading. Notable hospitals in Kisumu County include Jaramogi Oginga Odinga Training & Referral Hospital, Kisumu County Hospital, The Aga Khan Hospital Kisumu and Avenue Health Care Hospital in Kisumu.

## 3.3 Target Population

The target population comprised of nurses who are working in medical, surgical wards and diabetic clinics of selected hospitals included in the study.

### 3.3.1 Inclusion Criteria

Nurses who agreed to participate in the study, both male and female, those who had signed the informed consent and were working in the medical, surgical wards and diabetic clinic at the time of data collection.

### 3.3.2 Exclusion Criteria

Nurses without diploma certificates and bachelor’s degree levels, nurses who did not agree to participate in the study, nurses who did not sign the informed consent.

## 3.4 Sample Size Determination Calculation

Sample Size calculation was done using Fishers method of the total target population of nurses working in the medical, surgical wards and diabetic clinics. Given that the proportion of the population having the required characteristics is estimated at 50% (p=0.5) the sample size was determined using the following formula Mugenda, (2003). n=Z2pq/n where:

z = the standard normal deviate at the required confidence level at 95% (equivalent to 1.96)

p = the proportion in the target population estimated to have characteristics being

measured. q = 1-p, d = the level of statistical significance set at + or – 5% or 0.05

Since the target population is less than 10,000, the final sample estimate (nf) will be calculated as follows (Fisher *et al.,*1983): nf=n/1+n/N

Where: nf = the desired sample size (when the population is less than 10,000).

N = the estimate of the of the population size which is 112

In this study the proportion of the target population with a certain characteristic is 50, the z-statistic is 1.96, and the error risk assuming 95% CI is 0.05 therefore, the sample size is:

n =

(1.96)2(0.5) (0.5)

(0.05)2

n=384

Therefore n=384 divide by 1+n/estimate of the population

nf=384/1+384/112

nf=384/1+3.4

nf=384/4.4

nf=87

10% of the population was selected to cater for non-response rates. This was 10% of 87 that gave 9 participants. Therefore the sample size became 96.

Since the respondents were drawn from diverse working hospital environments it was believed that they would provide rich and helpful data. The researcher sought permission to conduct the study in the identified hospitals. The researcher then obtained the nurses’ consent for participation in the study after giving full information about the study and clarifying all issues of concern to the respondents. This was done through signing the informed consent forms (See Appendix IV).

## 3.5 Sampling Procedure

Kisumu County has both public and private hospitals according to levels, from this 3 of the 9 public hospitals were picked using simple random sampling method according the level of the hospital.These hospitals were: Jaramogi Oginga Odinga Teaching and Referral Hospital (JOORTH), Kisumu County Hospital (KCH), Ahero Sub County Hospital (ASCH), The Aga Khan Hospital Kisumu (AKHK) and Avenue Health Care Hospital (AHC). This selection involved 3 public and 2 private hospitals due to the levels or tiers within the county. The total numbers of nurses in the sampled hospitals were 112. Total sample as determined was 96 and the research included simple random sampling method and proportionate allocation to pick nurses from selected hospitals under study as follows:

#### Table 3.1 List of Hospitals visited and Sample Size Calculation

|  |  |  |
| --- | --- | --- |
| **Public Hospitals** | **Total number of Nurses in the study areas** | **Sample size** |
| JOORTH | 40 | 96/112\*40=34 |
| KCH | 20 | 96/112\*20=17 |
| Ahero Sub County Hospital | 2 | 96/112\*2=2 |
| **Private Hospitals** |  |  |
| The Aga Khan Hospital | 30 | 96/112\*30=26 |
| Avenue Health Care | 20 | 96/112\*20=17 |
| **Total** | 112 | 96 |

In simple Random Sampling each nurse had an equal chance of being selected in the sample. Using the sampling unit as shown in table 3.1, randomness is assured by a sampling procedure, where Yes and No was written down on small papers of uniform size where the nurses were to choose from. The papers were mixed well in a small container and the required slips were picked by the nurses at random. Those who choose the papers written Yes formed the representative sample given the proportion of the study participants expected from a given study area.

Nurses who were present on the selected wards were asked to complete a diabetic self-assessment report tool after signing the consent form. No internet or reference materials were allowed in the wards, this ensured that the nurses did not seek external assistance to answer the questions. A research assistant, who utilized the checklist, observed two to three nurses on shift each ward under study. The research assistants had not previously interacted with the nurses, and the nurses did not know that they were being observed. This helped in minimizing changes the staff could do in their usual routine care if they knew that they were being observed. The finding from the nurses on how they assessed patients and their practice was also noted down.

## 3.6 Development of Research Instrument

To collect data in this research a diabetic self-assessment questionairre was used. The questionairre administered was organized in the following sections: socio demographic characteristics, knowledge on the nature and scope of diabetes, factors influencing nurses’ competence in clinical assessment of diabetic patients and nurses’ clinical competence in assessment of diabetic patients and an observation checklist administered by the research assisistants. The research assistants who were nurses working in the study areas had been trained on how to conduct the observation.Research assistants observed how the nurses conducted the assessments on diabetic patients, without them realizing that they were being observed. All the research tools were piloted in a different hospital other than the hospitals identified in the study to ascertain their validity and reliability in the study.

## 3.7 Pre-test of Research Instrument

Pretest refers to a trial administration of an instrument to identify flaws. When a study tool is used as a data gathering instrument, it is used to determine whether questions and directions are clear to study participants and whether they understand what is required from them. The diabetic self-report tool was piloted in Oasis hospital, a different hospital other than the ones identified for the study. A pilot study was conducted to clarify instructions, check the appropriateness of the language used in the research instruments and to determine the difficulty of the items in the instruments in order to make adjustments in the study tool.

However before the study some precautions were taken into consideration to include: First and foremost, short, clear and straightforward questions in order to eliminate ambiguity. Secondly, the researcher had a discussion with the nurses prior to presentation of the tool on the purpose of the study. This was to motivate the nurses to own up to the process by filling in the items required in the tool.

## 3.8 Validity and reliability of instruments

### 3.8.1 Validity of the Instrument

This was ensured by providing a pretested diabetic self-reported questionairre with the statements based on the content from the literature review and the study objectives.

### 3.8.1 Reliability of the Instrument

This was achieved by consistency in the administration of the research tool during data collection period and on individual basis.

## 3.9 Data Collection Tool

Data was collected using participant observation checklist, and a diabetic self administered questionairre. The tool was administered to the nurses who were working in the medical, surgical wards and diabetic clinics of the selected hospitals identified for study. The tools were personally distributed by the researcher and her assistants to the nurses. The questionairre had parameters which were to explore the study participants’ knowledge, factors influencing nurses’ competence and nurses’clinical competence in assessment of diabetic patients admitted in medical and surgical wards, and clients attending the diabetic clinics. Data collection started with self-introduction and overview of the research including the study objectives. Explanations were given to respondents as required and the questionaires were administered after signing the consent form. The participant observation checklist

**3.9.1 Data Quality Control**

The questionnaires were pre tested and research assistants were trained for two days on the objectives of the study, sampling procedure, checking the completeness of questionnaires. Furthermore data were checked during entry into the computer before analysis.

## 3.10 Data Analysis

Quantitative data were coded, and entered in a statistical computer package SPSS version 20.0 data were edited for errors and corrected accordingly. Data were analyzed using specific tests depending on the variables. Descriptive statistics generated frequencies, and percentages. Inferential statistics such as chi-square, Cramer’s V and correlation coefficients were done to test the strength of relationships between the variables to include age, education level, gender, competency, knowledge, assessment, factors influencing competency, diabetic complications, nursing assessment and exercise. Data analysis was done as per the objectives. Analyzed data were presented in tables. Data security was ensured by use of passwords kept by the investigator only.

## 3.11 Ethical Consideration

Prior to conducting the study, approval was sought from the Institutional Ethical Review Committee (IERC) of the University of Masinde Muliro University of Science and Technology, where logistical and ethical considerations were included, as well as from the Executive Administrative Team at the facilities in which the study was conducted. In compliance with the outlined regulations brought forth by the facility, the principal investigator provided contact information to each nurse participant in lieu of questions regarding participation in the study. The participants were assured of anonymity in joining the study; they were also informed of it’s voluntary to participate and that there was no penalty for those not willing to participate.

The researcher avoided strategies that would compromise the nurses’ values or put them at risk. Informed consent and maintaining confidentiality were the ethical issues considered in this study. The researcher accurately represented what the nurses reported without biases.

### 3.11.1 Informed Consent

Consent refers to the process of giving respondents an opportunity to decide whether to participate in a particular study or not. Adequate information and opportunity to enquire was availed before nurses were asked to fill in the informed consent forms. The respondents in this study were nurses working in the medical, surgical and diabetic clinics. The nurses were given all the relevant information about the study that was to be undertaken. This was important for the nurses to give consent without coercion, pressure or undue enticement. The researcher ensured that the nurses’ anonymity was maintained, and this was to allow them to choose to either participate in the study or not.

### 3.11.2 Confidentiality

The material and information provided by the respondents would be destroyed upon completion of the study period to protect their confidentiality. The researcher had no intention whatsoever to use the nurses’ names in any publication.

### 3.11.3 Privacy

This was safeguarded where no disclosure of information was done by researchers to others at any point during the study. No identification of nurses involved in the study was done during data collection and coding was done during this time.

### 3.11.4 Beneficence

In this study the registered nurses involved were given information on what the study was about, and a debriefing after the study. This gave the nurses involved in the study room to ask questions and clarifications about the study. This ensured that the risks incurred will not be greater than the normal.

### 3.11.5 Non maleficence

This would entail the duty to benefit others and prevent any harm in the study.

### 3.11.6 Justice

In this research fairness and equity was observed, where a procedure of selecting registered nurses to be involved in the study was done using an inclusive criteria.

# CHAPTER FOUR

# RESULTS

## 4.1 Overview

This chapter presents the study findings which have been discussed in line with the study objectives, themes and sub themes areas as follows: Response rate, , demographic data, general information of the respondents, observation checklists used and the results of the study conducted.

The objective of the study was to determine the nurses’ clinical competence in assessment of diabetic patients in selected hospitals in Kisumu County. To enhance quality, the collected data from all the respondents was analyzed using the Statistical Package for Social Sciences version 20.0 (SPSS). Results are presented in this section in various forms.

## 4.2 Response Rate

The diabetic self-administered questionairre was administered to the nurses who worked in surgical and medical wards during the study period. A total of 96 diabetic self-administered questionairres were completely filled which gave 100% response rate. The response rate was sufficient and representative and conforms to Mugenda and Mugenda (2003), stipulating that a response rate of 50% is adequate for analysis and reporting; a rate of 60% is good and a response rate of 70% and above is excellent. Thus, a response rate of 100% was fit and reliable for the study.

## 4.3 Distribution of Demographic Characteristics of the Respondents

This section sought to identify the demographic information of the respondents including gender, age, years of experience in nursing in the organization and the level of education. These characteristics are important because they are known to influence the variables in a given study. The gender of the nurses should be an important consideration since diabetic patients who have complications could prefer sharing with persons of same gender e.g. erectile dysfunction. The profession and working period of the nurses in the clinics and wards in the hospitals was important to determine their area of specialization, qualifications and competences’ to manage patients with diabetes mellitus. The general information points at the respondents’ suitability in answering the questions and vast awareness on management and control of diabetes mellitus complications.

#### Table 4.1 Respondents Bio-Data

|  |  |  |
| --- | --- | --- |
| **Characteristic** | **Number** | **%** |
| **Age in Years** |  |  |
| 25-29 | 22 | 22.9 |
| 30-34 | 13 | 13.5 |
| 35-39 | 28 | 29.2 |
| 40-44 | 25 | 26.1 |
| 45-49 | 8 | 8.3 |
| **Total** | **96** | **100** |
| **Gender** |  |  |
| Male | 39 | 40.6 |
| Female | 57 | 59.4 |
| **Total** | **96** | **100** |
| **Level of Education** |  |  |
| Diploma | 58 | 60.5 |
| Bachelor’s Degree | 38 | 39.5 |
| **Total** | **96** | **100** |
| **Years of Nursing Experience** |  |  |
| 1-5 | 20 | 20.8 |
| 6-10 | 32 | 33.4 |
| Over 10 years | 44 | 45.8 |
| **Total** | **96** | **100** |

A total of 96 nurses participated in the study, 35 (36.4%) nurses were at the age of 25 to 35 years and 61 (63.6%) nurses were aged between 35 to 49 years.Among the respondents 57 (59.4%) were females and 39 (40.6%)were males of the total population.

On education level, 58(60.5%) nurses were diploma holders compared to bachelors’ degree holders who accounted for 38(39.5%).On working experience 44(45.8%) nurses of the study population had over 10 years of experience, 32 (33.3%) 6 to 10years and 20 (20.8%) less than 5 years of experience.

## 4.4 Nurses’ Knowledge on the Nature and Scope of Diabetes Mellitus

A questionairre consisting of 15 items testing the nurses’ knowledge on selected aspects of diabetes was administerd to the nurses and scored out of 100% and any scores above 70% were graded as knowledgeable and those scoring below 70% were graded as not knowledgeable.

Table 4.2 indicates that 88 (91.6%) nurses involved in the study, had knowledge on the etiology of Type 1 diabetes compared to 8(8.3%) nurses who did not have knowledge on the etiology of type 1 diabetes mellitus. A total of 87(90.6%) nurses who participated in the study had knowledge on the etiology of type 2 diabetes mellitus,and 9(9.3%) did not. Eighty three (86.4%) nurses had knowledge on the basic treatment plan for type 1 diabetes mellitus, only 13(13.5%) did not know the treatment plan for type 1 diabetes. Eighty three nurses (86.4%) had knowledge on the basic treatment plan for type 2 diabetes mellitus and only 13(13.5%) did not have knowledge on the basic treatment plan for type 2 diabetes mellitus. Eighty five (88.5%) nurses had knowledge the long-term complications of diabetes and only 11 (11.4%) nurses could not have knowledge on the longterm complications of diabetes mellitus.

#### Table 4.2 Nature and Scope of Diabetes Mellitus

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Serial No. |  | Knowledgeable (> 70%) | Not Knowledgeable  (< 70%) | Total |  |  |  |
| 1 | Etiology of Type 1 | 88 (91.6%) | 8(8.4%) | 96 |  |  |  |
| 2 | Etiology of Type 2 | 87(90.6%) | 9(9.4%) | 96 |  |  |  |
| 3 | Treatment plan type 1 | 83(86.5%) | 13(13.5%) | 96 |  |  |  |
| 4 | Treatment plan Type 2 | 82(86.4%) | 14(13.9%) | 96 |  |  |  |
| 5 | Long term DM complications | 85(88.5%) | 11(11.4%) | 96 |  |  |  |

## 4.5 Relationship between years of experience and knowledge of Diabetic complication

Table 4.3 findings on the relationship between years of experience and diabetic complication knowledge shows that,a higher proportion of nurses who had worked for over than 10 years of experience years 44(100%) were knowledgeable with regard to diabetic complications compared to 15(75%) nurses with less than 5 years of working experience who did not have knowledge on diabetic complications.

#### Table 4.3 Relationship between years of experience and knowledge of Diabetic complication

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | | **Diabetic complications** | | |  |
| Nurses years of experience | Knowledgeable | | Not knowledgeable | Total | |
| 1-5 years | 5(25%) | | 15(75%) | 20 | |
| 6-10 years | 22(68.8%) | | 10(31.2%) | 32 | |
| Over 10 years | 44(100%) | | 0(0%) | 44 | |
| Total | 71 | | 25 | 96 | |

**ᵡ**2=9.785 p<0.04

## 4.6 Etiology of diabetes and years of experience

Findings have shown that the larger proportion of nurses with over 10years of experience (97.7%)knew the etiology of type 1 diabetes as compared to those with less 10 years of experience in practice (92%).

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Table 4.4 Etiology of diabetes and years of experience  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | |  | **Description of Etiology of Type 1 Diabetes** | | |  | | | Nurses years of experience | | Knowledgeable | Not knowledgeable | | Total | | 1-5 years | | 19(95%) | 1(5%) | | 20 | | 6-10 years | | 29(90.6%) | 3(9.4%) | | 32 | | Over 10 years | | 43(97.7%) | 1(2.3%) | | 44 | | Total | | 91 | 5 | | 96 |   **ᵡ**2=11.179; p< 0.0514 4.7 Basic treatment plan for type 1 Diabetes and Age of the nurses From table 4.5 above, there is an indication that 100% of the nurses aged 45 to 49 years could describe the basic treatment plan for type 1 diabetes, compared to those under the age of 29(90.9%) A further test done by chi-square revealed that there is a significant relationship between age of nurses and the description of the basic treatment plan for type 1 diabetes mellitus(**ᵡ**2=11.179 p<0.0514;Cramers V value 0.214). Table 4.5 Basic treatment plan for type 1 Diabetes and Age of the nurses  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | |  | **Description of Treatment plan for type 1 diabetes** | | |  | | | Nurses’ Age (years) | | Knowledgeable | Not knowledgeable | | Total | | 25-29 | | 20(90.9%) | 2(9.1%) | | 22 | | 30-34 | | 10(76.9%) | 3(23.1%) | | 13 | | 35-39  40—44  45--49 | | 24(85.7%)  24(96%)  8(100%) | 4(14.3%)  1(4%)  0(0%) | | 28  25  8 | | Total | | 86 | 10 | | 96 | |

## 4.8 Years of Experience and description of Etiology of type 2 diabtes

Nurses who had over 10 years of experience 43(97.7%) had knowledge on the etiology of type 2 diabetes mellitus while 1(2.3%) nurse did not have knowledge on type 2 diabetes mellitus, 29(90.6%) nurses with 6 to 10 years experience were knowledgeable on the etiology of diabetes mellitus type 2 and only 3(9.4%) nurses was not knowledgeable on the etiology of type 2 diabetes mellitus. Finally 18(90%) nurses who had an experience of less than 5 years were knowledgeable on diabetes type 2, only 2(10%) of the nurses with less than 5 years of experience were not knowledgeable on how to describe the etiology of type 2 diabetes. A further test done by chi-square and Cramers’ V revealed that there is a significant relationship between years of experience and the knowledge of type 2 diabetes mellitus( **ᵡ**2=3.680 p<0.0451; Cramers’ V value 0.135).

#### Table 4:6 Years of Experience and description of Etiology of type 2 diabtes

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Description of Etiology of Type 2 Diabetes** | | |  | |
| Nurses years of experience | | Knowledgeable | Not knowledgeable | | Total |
| 1-5 years | | 18(90%) | 2(10%) | | 220 |
| 6-10 years | | 29(90.6%) | 3(9.4%) | | 32 |
| Over 10 years | | 43(97.7%) | 1(2.3%) | | 44 |
| Total | | 90 | 6 | | 96 |

**ᵡ**2=3.680 p<0.0451

## 4.9 Treatment plan for type 1 Diabetes and Education Level of the nurse

Table 4.7 indicates that, nurses with a bachelor’s degree holder 36 (94.7%) were more knowledgeable on the basic treatment plan for type 1 diabetes mellitus compared to diploma holder nurses 47(81.0%) who were less knowledgeable on the treatment plan for type 1 diabetes.

A further test by chi square and Cramer’s V revealed that, there is a significant relationship between education level and knowledge level of basic treatment plan for diabetes type 1. In conclusion there is a strong relationship between knowledge and education level of the nurseon the care given to patients with diabetes mellitus (**ᵡ**2=7.704 p< 0.05; Cramer’s’ V value 0.270).

#### Table 4:7 Treatment plan for type 1 Diabetes and Education Level of the nurse

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Description of Treatment plan Type 1 Diabetes** | | |  | |
| Education Level | | Knowledgeable | Not knowledgeable | | Total |
| Diploma | | 47(81%) | 11(19%) | | 58 |
| Bachelors Degree | | 36(94.7%) | 2(5.3%) | | 38 |
| Total | | 83 | 13 | | 96 |

**ᵡ**2=7.704 p< 0.05

## 4.10 Competent diabetic complication assessment and age of the nurse

87.5% (7) nurses aged 45 to 49 years competently assessed for the development of diabetic complications and out of this only 1(12.5%) of the nurses could not competently assess for the development of diabetic complications. Among the nurses aged 40 to 44 years 96%(24) competently assessed for diabetic complications and only 1(4%) did not competently assess on diabetic complication.Five (38.5%) nurses aged 30 to 34 years could not competently assess for diabetic complications and out of this 61.5 %( 8) nurses aged 30 to 34 years competently assessed for diabetic complications. Nurses aged between 25 to 29 years 17 (77.3%) could competently assess for the development of diabetic complications and out of this 5(22.7%) could not comppetently assess for diabetic complications. This showed a significant relationship between diabetic complication and age of the nurse (**ᵡ**2=14.786 p< 0.05; Cramers’V value 0.263).

#### Table 4.8 Competent diabetic complication assessment and age of the nurse

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Competence in diabetic complication assessment** | | |  | |
| Nurses’ Age (years) | | Competent | Not competent | | Total |
| 25-29 | | 17(77.3%) | 5(22.7%) | | 22 |
| 30-34 | | 8(61.5%) | 5(38.5%) | | 13 |
| 35-39  40—44  45--49 | | 17(60.7%)  24(96%)  7(87.5%) | 11(39.3%)  1(4%)  1(12.5%) | | 28  25  8 |
| Total | | 73 | 23 | | 96 |

**ᵡ**2=14.786 p<0.05

## 4.11 Diabetic Nursing Clinical Competence Checklist

From the observations made by the researcher from the 96 nurses, competence assessments were done on the aspects of history taking, physical examinations and investigations done. On history taking 78(81.2%) nurses did a competent complete history taking compared to 18(18.8%) nurses who did not do a competent complete history taking on diabetic patients.

On physical examination and complication assessment 60(62.5%) nurses did a competent assessment compared to 36(37.5%) nurses who did not do a competent assessment. A competent eye assessment was done by 86(89.6%) nurses and only 1(1.2%) nurse was incompetent. A competent reproductive system assessment was done by 70(72.9%) nurses compared to 26(27.2%) nurses who did not assess competently. Neurological assessment was competently done by 80(83.3%) nurses and 16(16.7%) nurses did not assess the patients competently. Foot assessment was competently done by the study participants and 2 diabetic foot complications were identified. Renal system was competently done by 60(62.5%) nurses and 36(37.5%) nurses did not assess well.Generally a systematic focused examination by the nurses was done on assessing diabetic patients especially those systems where the complications were likely to occur.

On investigations done 40 (41.7%) nurses had knowledge on HBA1C that was competently done compared to 56(58.3%) nurses did not have knowledge HBA1C and was not done. All the 96 nurses(100%) under study were competent in checking the blood sugar of a diabetic patient.Urinalysis was competently done by 70(72.9%) nurses and 26(27.1%) nurses did not do a urinalysis .

#### Table 4.9: Diabetic Nursing Clinical Competence Checklist

|  |  |  |
| --- | --- | --- |
| **Diabetic Nursing Clinical Competence Checklist** | Competent | Not Competent |
| **1.History taking on :** |  |  |
| Diabetes as a disease | 96 | 0 |
| Duration of illness | 90 | 6 |
| Past medical history | 96 | 0 |
| Family socio economic history | 86 | 10 |
| Diabetic medication | 94 | 2 |
| **2.Physical examination and complication assessment on:** |  |  |
| Eyes | 86 | 10 |
| Skin | 75 | 21 |
| Renal | 60 | 36 |
| Foot | 96 | 0 |
| Respiratory | 96 | 0 |
| Gastrointestinal | 82 | 14 |
| Cardiovascular | 96 | 0 |
| Neurological | 80 | 16 |
| Reproductive system | 70 | 26 |
| **3.Investigations done** |  |  |
| Urinalysis | 70 | 26 |
| Blood sugar depending on the time either random or fasting | 96 | 0 |
| HBA1C | 40 | 56 |

## 4.12 Nurses’ Clinical Competence in Assessment of Diabetic Patients

Eighty six (89.6%) nurses involved in the study were competent in giving instructions to diabetic patients on self-care management of a sick day. Only 10 (10.4%) nurses could not competently instruct. Nurses 84(87.5%) competently described the effect of insulin administration to diabetic patients and only 12(12.5%) nurses could not competently describe the effects of insulin administration. From the total number of nurses involved in the study 56 (58.3%) nurses could not competently explain how stress affects diabetic control. Only 40 (41.6%) nurses competently explained how stress affects diabetic control to diabetic patients.Ninety two (95.8%) competently adviced diabetic patients on personal care. Only 4 (4.2%) did not competently advice diabetic patients on personal care while managing the problem. A total of 92(95.8%) nurses involved in the study had the knowledge of how early detection and screening services would reduce diabetic complications and were competent, only 4(4.2%) nurses were incompetent on how early detection and screening services would reduce diabetic complications.

Table 4.10, has shown that 93(96.9%) nurses involved in the study would competently identify how lifestyle modifications like frequent exercises, proper dietary intake, cessation of smoking and alcohol consumption is essential in the management and control of diabetic complications. Eighty(83.3%) nurses competently taught diabetic patients on self-administration of insulin especially patients with type 1 diabetes, only 16(16.7%) nurses could not competently teach the diabetic patients on self-administration of insulin.From the study 90(93.8%) nurses competently offered counseling and health education to diabetic patients on the various types of diabetes mellitus, only 6(6.25%) nurses did not competently offer counseling and health education to diabetic patients on the various types of diabetes mellitus. Ninety(93.8%) of the nurses in the study had competent knowledge and skills on good management of diabetes mellitus that reduces complications related to the disease, only 6(6.25%) did not have competent knowledge and skills in the management of diabetes mellitus in the reduction of its complications. Majority of the nurses competently adviced patients on the importance of follow up care.

#### Table 4.10 Nurses’ clinical competence in assessment of diabetic patients

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Objective Two Questions** | **Competent** | **Not competent** | **Total** |
| 1 | Patient education on self-care management instructions of a “sick day” | 86 | 10 | 96 |
| 2 | Instructions on action and effect of insulin administration | 84 | 12 | 96 |
| 3 | Explanation on how stress affects diabetes control | 40 | 56 | 96 |
| 4 | Instructions on daily personal care diabetic patients | 92 | 4 | 96 |
| 5 | Screening services instructions to reduce diabetic complications | 92 | 4 | 96 |
| 6. | Lifestyle modification instructions to diabetic patients | 93 | 3 | 96 |
| 7 | Teaching and demonstration on self-administration of insulin | 80 | 16 | 96 |
| 8 | Counseling and health education on the various types of diabetes mellitus | 90 | 6 | 96 |
| 9 | Advice on diabetes mellitus complications | 90 | 6 | 96 |
| 10 | Advice on followup care for diabetic patients | 88 | 8 | 96 |

## 4.13 Use of a Glucometer for blood Glucose monitoring and Education Level of the Nurse

From table 4.11 study findings on the use of a glucometer for blood glucose monitoring shows that 91 nurses both bachelors degree 37 (97.4%) and diploma holders 54(93.1%) competently used a glucometer to monitor blood sugar for diabetic patients. Only 5 (5.2%) nurses of the total nurses involved in the study could not competently use a glucometer to monitor blood sugar for patients with diabetes.

According to key informants from the institutions on how the nurses were assessed for competency, one of them said that the clinical nurse instructor who is the head nurse in the study areas checked her nurses’ skills on blood glucose monitoring using an glucometer machine on monthly basis and thus he or she develops their skills while attending to diabetic patients. This feedback was also given immediately after identifying any gaps and it was part of staff development process in those study areas.

#### Table 4:11 Use of a Glucometer for blood Glucose monitoring and Education Level of the Nurse

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Glucometer Use for Blood Glucose Monitoring** | | |  | |
| Education Level | | Competent | Not competent | | Total |
| Diploma | | 54(93.1%) | 4(6.9%) | | 58 |
| Bachelors Degree | | 37(97.4%) | 1(2.6%) | | 38 |
| Total | | 91 | 5 | | 96 |

## 4.14 Nurses’ Clinical assessment of a diabetic hypo/hyperglycaemic patient experiencing loss of consciousness and Education Level of the Nurses

From table 4.12 findings show that nurses who had a bachelor’s degree 37(97.4%) could competently perform the nursing assessment of a patient with diabetes experiencing loss of consciousness compared to nurses with diploma holders 49(84.5%%) and only 10(10.4%) of the total nurses could not competently assess a diabetic patient experiencing loss of consciousness. This shows that there is a relationship between nursing care and education level of the nurses.

#### Table 4:12 Nurses’ Clinical assessment of a diabetic hypo/hyperglycaemic patient experiencing loss of consciousness and Education Level of the Nurses

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Diabetic hypo/hyperglycaemic** | | |  | |
| Education Level | | Competent | Not competent | | Total |
| Diploma | | 49(84.5%) | 9(15.5%) | | 58 |
| Bachelors Degree | | 37(97.4%) | 1(2.6%) | | 38 |
| Total | | 86 | 10 | | 96 |

## 4.15 Clinical Competence Assessments in the prevention of Diabetic Complications

Clinical competence assessments done during the study were: nutritional, vascular, self-care, risk, eye assessment, renal assessment, foot assessment, neurological and cardiovascular complication assessment. All this was incorporated in the questionnaire as per Table 4.11.

Table 4.14 indicates that 76(79.2%) nurses involved in the study competently assessed a patient with diabetes going to the operating room to include; blood sugar check before surgery, use of hypoglycemic drugs and insulin before surgery. Only 20(20.8%) nurses could not competently do the assessment. Ninety (93.8%) nurses competently managed a patient who experienced mild hypoglycemia by checking blood sugar and providing a quick intervention on glycemic control, only 6(6.25%) could not competently assess the nursing needs of a patient experiencing hypoglycemia. Among the nurses involved in the study and who could competently manage the nursing assessment of a patient with diabetes experiencing loss of consciousness by checking blood sugar, taking of vital signs and provide early intervention to prevent complication were 86(89.6%) and only 10(10.4%) could not competently assess and manage a patient experiencing loss of consciousness. Eighty five registered nurses (88.5%) could competently assess for the development of diabetic complications to include foot, hypoglycemia, hyperglycemia, only 11(11.5%) could not competently assess. The nurses who could competently assess the diet recommended for a patient with diabetes mellitus like sugar free, portion of food and a balanced diet rich in green vegetables were 91(94.8%) and only 5(5.2%) of the total nurses could competently assess.. Ninety one (94.8%) nurses in the study could competently do a blood sugar check and monitoring like daily use of glucometer machine to know the sugar level of a diabetic patient, only 5(5.2%) nurses could not competently use a glucometer for blood sugar monitoring. Nurses who could competently assess the three sites for insulin administration to include lower abdomen, lateral aspect of the thighs and deltoid muscle, were 91(94.8%), only 5(5.2%) nurses could competently assess . From the total number of nurses who participated in the study, 88(91.7%) could competently do a nursing assessment for a patient with diabetes experiencing hyperglycemia without ketosis, only 8(8.3%) nurses could not competently manage.

Table 4.13 has shown that, 91(94.8%) of the nurses involved in the study could competently assess the signs and symptoms of hypoglycemia and hyperglycemia and only 5(5.2%) nurses could not competently assess the signs of hypoglycemia and hyperglycemia which are the common diabetic complications. Finally 92(95.8%) nurses could competently do a general and focused assessment on diabetic patients admitted to the wards or attending clinics to prevent the onset of complications and only 4(4.2%) nurses could not competently assess a patient to prevent the onset of diabetic complication.

#### Table 4.13 Nurses’Clinical Competence Assessments in the prevention of Diabetic Complications

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Clinical competencies** | Competent | Not competent | Total/percentage |
| 1 | Preoperative nursing | 76(79.2%) | 20(20.8%) | 96(100%) |
| 2 | Assessing hypoglycemia | 90(93.8%) | 6(6.2%) | 96(100%) |
| 3 | Neurologic assessment | 86(89.6%) | 10(10.4%) | 96(100%) |
| 4 | Diabetic complications assessment | 85(88.5%) | 11(11.5%) | 96(100%) |
| 5 | Nutritional assessment | 91(94.8%) | 5(5.2%) | 96(100%) |
| 6 | Blood sugar check monitoring method | 91(94.8%) | 5(5.2%) | 96(100%) |
| 7 | Assessing sites for insulin administration | 91(94.8%) | 5(5.2%) | 96(100%) |
| 8 | Hyperglycemia without ketosis assessment | 88(91.7%) | 8(8.3%) | 96(100%) |
| 9 | Hyperglycemia signs and symptoms | 91(94.8%) | 5(5.2%) | 96(100%) |
| 10 | General and focused assessment | 92(95.8%) | 4(4.2%) | 96(100%) |

## 4.16 Use of a Glucometer for blood glucose monitoring and education level

Findings from Table 4:14, have shown that nurses who had bachelor’s degree 37(97.4%) would competently use a glucometer for blood glucose monitoring compared to diploma holders 54(93.1%) , and out of this only 5(4.4%) of the total nurses with bachelors and diploma holders could not competently use a glucometer for glucose monitoring. A further test done by chi-square and cramers’ V showed that, there was a significant relationship between performance of blood glucose monitoring and the level of education. (**ᵡ**2=52.208 p=0.00; Cramers’ V value 0.498).

#### Table: 4.14 Use of a Glucometer for blood glucose monitoring and education level

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Glucometer use for glucose monitoring** | | | |  | |
| Education Level | | Competent | Not competent | Total | | |
| Diploma | | 54(93.1%) | 4(6.9%) | | | 58 |
| Bachelors Degree | | 37(97.4%) | 1(2.6%) | | | 38 |
| Total | | 91 | 5 | | | 96 |

**ᵡ**2=52.208 p=0.000

## 4.17 Assessing sites for insulin administration and Education Level of the nurse

Nurses who had a bachelor’s degree 38(100%) competently assessed the sites for insulin administration compared to 53(91.4%) nurses with diploma. Only 5(8.6%) of the diploma holder nurses could not competently identify and assess the sites for insulin administration. Of those who could not identify the three sites of insulin administration were nurses with diploma holders. Therefore there is a strong significant relationship or association between the level of education and identification of three sites of insulin administration (**ᵡ**2=27.737 p<0.00; Cramers’ V 0.530).

According to the focus group discussion done with heads of departments on areas under study, on how they assessed their nurses on diabetic assessment that included identification of sites for insulin administration, feedback was that on any given day one nurse was allocated to do the assessment on one patient, check on diabetic care, including equipment check for blood sugar monitoring while on shift, while this was done the rest of the nurses could learn and any gap identified clarified at that time. This was a routine in some areas under study where quality was highly observed according to the standards set in that institution. The results from the skill check done on this nurses was documented in their personal files as evidence of training undertaken within the institution .Some said that this are key indicators as far as diabetic assessment was concerned in the institution. This was an indicator of competency assessment for the nurses’ knowledge as translated to practice.

Another head nurse said that, as part of the nurses’ continuous education nurses need skill checks done quarterly and this has shown a lot of improvement on the nurses’ knowledge, skills and practice.

Diabetic assessment starts from admission of a patient till discharge and follow up care, this comment came up from one of the heads of department in the outpatient clinic

#### Table: 4.15 Assessing sites for insulin administration and Education Level of the nurse

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Assessing sites for insulin administration** | | |  | |
| Education Level | | Competent assessment | Incompetent assessment | | Total |
| Diploma | | 53(91.4%) | 5(8.6%) | | 58 |
| Bachelors Degree | | 38(100%) | 0(0%) | | 38 |
| Total | | 91 | 5 | | 96 |

**ᵡ**2=27.737 p<0.000

## 4.18 Diet recommended for a diabetic patient and education level of the nurse

Nurses with a bachelor’s degree holder 38(100%) competently explained the diet recommended for a patient with diabetes mellitus compared to 53(96.4%) nurses who were diploma holders who competently described the diet recommended for a patient with diabetes mellitus, only 5(3.63%) diploma holder nurses did not competently explain the diet recommended for a diabetic patient. A further test done by chi-square and Cramer’s V revealed that there was a strong and significant relationship between description of diet recommended for a patient with diabetes and education level **(ᵡ**2=16.842 p<0.00; Cramers’ V 0.413).

#### Table: 4.16 Diet recommended for a diabetic patient and education level of the nurse

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Diet for a diabetic patient** | | |  | |
| Education Level | | Competent | Not competent | | Total |
| Diploma | | 53(91.4%) | 5(8.6%) | | 58 |
| Bachelors Degree | | 38(100%) | 0(0%) | | 38 |
| Total | | 91 | 5 | | 96 |

**ᵡ**2=16.842 p<0.000

## 4.19 Years of experience and use of glucometer for blood glucose monitoring

Table 4.17 shows that nurses who had over 10 years’working experience 44 (100%) competently used a glucometer for blood glucose monitoring, whereas 1(5%) of the nurses less than 5 years of experience did not competently use a glucometer blood glucose monitoring. Nurses with an experience 6 to 10 years 31(96.9%) could competently use a glucometer for blood sugar monitoring and only 2 (3.1%) nurses could not. Nurses who had less than 5 years of experience 19 (95%), could competently use a glucometer for glucose monitoring and only 1(5%) could not competently use a glucometer for blood glucose monitoring. This shows that there is a very strong significant relationship between years of experience of the nurses and ability to use a glucometer to monitor blood glucose levels for diabetic patients (**ᵡ**2=34.627 p<0.00; Cramer’s V 0.197).

#### Table 4:17 Years of experience and use of glucometer for blood glucose monitoring

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Glucometer use for blood glucose monitoring** | | |  | |
| Nurses years of experience | | Competent | Not competent | | Total |
| 1-5 years | | 19(95%) | 1(5%) | | 20 |
| 6-10 years | | 31(96.9%) | 1(3.1%) | | 32 |
| Over 10 years | | 44(100%) | 0(0%) | | 44 |
| Total | | 90 | 6 | | 96 |

**ᵡ**2=34.627 p<0.000

## 4.20 Daily nursing assessment for a patient with diabetes and years of experience

Nurses with an experience of over 10 years 44(100%) competently assessed diabetic patients on personal care. Nurses with an experience of 6 to 10 years 31(96.8%) competently assessed diabetic patients daily on personal care, only 3(3.1%) nurses could not competently assess diabetic patients daily on personal care.This shows that there is a very strong significant relationship between years of experience of the nurses and daily assessment for patients with diabetes (**ᵡ**2=35.793 p<0.00).This means that more experienced nurses had a greater ability to instruct on daily care for diabetic patients compared to the less experienced nurses.

#### Table 4:18 Daily nursing assessment for a patient with diabetes and years of experience

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Daily nursing assessment of a diabetic patient** | | |  |
| Nurses years of experience | | Competent | Not competent | Total |
| 1-5 years | | 18(90%) | 2(10%) | 20 |
| 6-10 years | | 31(96.8%) | 1(3.2%) | 32 |
| Over 10 years | | 44(100%) | 0(0%) | 44 |
| Total | | 93 | 6 | 96 |

**ᵡ**2=35.793 p<0.00

4.21 Identification of long term complications associated with years of experience

Table 4.19 shows that nurses who had an experience of over 10 years 42(95.5 %) could competently assess for long term complications associated with diabetes mellitus and only 2(4.5%) could not competently assess for the long term complications associated with diabetes mellitus. Of the nurses who had an experience of 6 to 10 years, 29(90.6%) competently assessed for the long-term complications associated with diabetes mellitus, and 3(9.4%) could not competently assess. Nurses with less than 5 years of experience 17 (85%) could competently assess for the long-term complications of diabetes mellitus and only 3 (15%) could not competently assess for the long term diabetic complications.

This shows that there is a very strong significant relationship between years of experience of the nurses and assessment of long-term complications associated with diabetes(**ᵡ**2=36.084 p<0.00).This means that years of experience of the nurses influences their ability to identify long term complications associated with diabetes mellitus.

This result on clinical competence on assessing diabetic patients has shown that there is a strong relationship between nurses’ years of experience, education level and competence in assessing diabetic patients and early prevention of both short term and long term complications.

#### Table 4:19 Identification of long term complications associated with years of experience

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Identification of longterm complications** | | |  | |
| Nurses years of experience | | Competent | Not competent | | Total |
| 1-5 years | | 17(85%) | 3(15%) | | 20 |
| 6-10 years | | 29(90.6%) | 3(9.4%) | | 32 |
| Over 10 years | | 42(95.5%) | 2(4.5%) | | 44 |
| Total | | 88 | 8 | | 96 |

**ᵡ**2=36.084 p<0.000

# CHAPTER FIVE

# DISCUSSION

## 5.1 Overview

This chapter presents a summary of the findings as per the research objectives and the research questions as summarized in themes below.

## 5.2 Nurses’ Knowledge on the Nature and Scope of Diabetes Mellitus and its complications

Findings from the study have shown that most of the nurses had knowledge on the nature and scope of diabetes mellitus on the various types of diabetes, clinical features, causes, assessment of complications and preventive measures as well as managing patients with diabetes mellitus.

Table 4.2 indicates that 88 (91.6%) nurses involved in the study, had knowledge on the etiology of Type 1 diabetes compared to 8(8.3%) nurses who did not have knowledge on the etiology of type 1 diabetes mellitus. A total of 87(90.6%) nurses who participated in the study had knowledge on the etiology of type 2 diabetes mellitus,and 9(9.3%) did not. Eighty three (86.4%) nurses had knowledge on the basic treatment plan for type 1 diabetes mellitus, only 13(13.5%) did not know the treatment plan for type 1 diabetes. Eighty three nurses (86.4%) had knowledge on the basic treatment plan for type 2 diabetes mellitus and only 13(13.5%) did not have knowledge on the basic treatment plan for type 2 diabetes mellitus. Eighty five (88.5%) nurses had knowledge the long-term complications of diabetes and only 11 (11.4%) nurses did not have knowledge on the longterm complications of diabetes mellitus.Although the nurses were knowledgeable on the etiology of diabetes they did not know about the effect of stress on diabetes mellitus.

A study done by Abduelkarem and El-Shareif (2013) assessed the DM knowledge of RNs in the hospital and found findings similar to those of Modic *et al.,* (2014). The mean score on a pretest of DM knowledge given to 116 RNs was 48.5%. RNs with more experience (greater than10 years) and higher education scored better than the mean pretest scores. Another important finding was that despite continuous years of experience, the RNs’ knowledge about DM reached a threshold during their career and did not increase without additional formal education.This study concurs with the current study findings.

In a study done in Benin City on diabetes mellitus knowledge among nurses results showed that, 191 nurses who participated in the study had an average score of 61.9±14.24 on a 100 point scale (Modic,2014). No nurse was able to correctly answer all questions. Nurses were able to recognize long term complications of diabetes with 86.9%, 86.4% of the respondents answering correctly questions on symptoms of numbness and tingling, cause of high blood glucose, and problems associated with diabetes respectively. Although, nurses knew that diet plays a great role in management of diabetes mellitus, they were not aware of the effect of "unsweetened" fruit juice on blood glucose (15.2%), a free food for a diabetic (20.9%), and the identification of a proper diabetes diet (42.9%). There was a statistical difference in the knowledge scores of nurses that had a family history of diabetes and those that did not (p< 0.05). In conclusion the knowledge of the nurses sampled as regards diabetes mellitus was less than satisfactory; areas of knowledge deficits included diet and signs of acute complications of diabetes as well as proper foot care. This study was contrary to the findings from the current study.

## 5.3 Nurses’ Competence in the Assessment of Diabetic Patients

Study findings on nurses’ competence has shown that, 91(94.8%) nurses involved in the study could competently assess for the signs and symptoms of hypoglycemia and hyperglycemia and only 5(5.2%) nurses could not competently assess the signs of hypoglycemia and hyperglycemia which are the common diabetic complications. Finally 92(95.8%) nurses could competently do a general and focused clinical assessment on diabetic patients admitted to the wards or attending clinics to prevent the onset of complications and only 4(4.2%) nurses could not competently assess a diabetic patient to prevent the onset of diabetic complication (**ᵡ**2=36.084 p<0.00).

This result on clinical competence on assessing diabetic patients has shown that there is a strong relationship between nurses’ years of experience, education level and competence in assessing diabetic patients and early prevention of both short term and long term complications.

This study indicates that nurses in Kisumu County’s’ selected hospitals; were competent and knowledgeable in the clinical competence assessment. The nurses provided information, counseling and dissemination of health education to the patients on individuals and groups on a weekly basis. The nurses had the ability to detect,diabetes related complications based on the clinic observations and records. Thus, findings have shown that nurses’ education,competency and practical skills play a major role in the management of diabetic complications in diabetes mellitus.

This results concur with a study done in Hawassa University(South Ethiopia) in 2015.The results revealed that nurses’ competency from a study of 87(25.2%) participants was 4 times clinically competent since they had adequate clinical practice than those nurses with inadequate clinical practice.

This result concurred with the diabetic competency framework 2010 UK guidelines that state that, for a competent diabetic care provider competency is as per the guidelines. It further stated that a growing number of practice nurses provide a high-level of diabetes care in their practice population. The role of the practice nurse at this level encompasses direct referral, assessment, care planning, teaching and clinical skills (WHO, 2010).

The guideline further states that practice nurses delivering high-level diabetes care should have: completed an accredited training course in diabetes care at the diploma level or higher, undertaken an accredited training programme in the initiation and management of insulin, a minimum of 2 years’ experience in the practice environment (WHO, 2010).

Therefore nurses’ competency influences patient assessment, management and control of diabetic complications (WHO, 2010).

Another study done at the Kenyatta National Hospital, on clinical care of diabetes by health care workers, adherence to diabetes guidelines by healthcare professionals at the hospital was poor, and this could worsen during patients’ subsequent visits. Poor adherence to annual risk assessment was also identified representing lost opportunity for early detection of preventable complications (Atieno, 2014).The findings found a gap that called for the health workers competences, availability and reasons for non-adherence to processes to be investigated. This study results were contrary to the current study findings.

## 5.4 Factors influencing nurses’ competence in the clinical assessment of diabetic patients.

Table 4.17 showed that nurses who had an experience of over 10 years 95.2 % (39) could identify the long term complications associated with diabetes mellitus, and only 2(4.8%) could not identify the long term complications associated with diabetes mellitus. Of the nurses who had an experience of 6 to 10 years, 29(90.5%) could identify the long-term complications associated with diabetes mellitus, and 3(9.3%) could not. Nurses with less than 5 years of experience 17(85%) could identify the long-term complications of diabetes mellitus and only 3(15%) could not identify.

This shows that there is a very strong significant relationship in the identification of long-term complications associated with diabetes by the nurses who participated in the study (**ᵡ**2=36.084 p<0.01).

In a study done in Libya on assessment on diabetes related knowledge on nursing staff within the hospital, showed that Non-Libyan nurses attained better scores than Libyan nurses; however, the difference disappeared when the duration of experience was taken into account (78.1% of non-Libyans had work experience of >10 years compared with 8.3% of Libyan nurses). Another contributing factor was the non-Libyan nurses’ good command of the English language, which enabled them to learn more from the doctors who communicated in English on a day-to-day work basis (Muchemi, 2011).

Findings from the study indicated that, knowledge level of nurses was highest for nurses working in pediatrics (62.0±5.5; p<0.05), when compared with nurses working in other specialty wards. The mean knowledge scores of nurses working in medicine units (53.0±12.8) was significantly higher than those working in surgery (43.6±16.2; p<0.01) and dermatology (38.3±15.2; p<0.01) units. However, the overall knowledge of diabetes among the nursing staff was found to be lacking; educational programs covering diabetes and inpatient diabetes management would be useful to improve nurses’ knowledge. Therefore the current study findings on the knowledge among nurses who worked in the research study areas was contrary to one done by Muchemi.

These study results can help to identify knowledge deficits among nursing team members and, in the context under analysis, guide strategic planning on nurses’ knowledge on diabetes.

# CHAPTER SIX

## CONCLUSION AND RECOMMENDATION

## 6.1 Conclusion

This study focused on clinical competence in assessment of diabetic patients among nurses in selected hospitals in Kisumu County.

Majority of the nurses had knowledge on the nature and scope of diabetes mellitus and were able to assess patients to prevent diabetic complications.

Only 40 (41.6%) nurses were able to explain how stress affects diabetes

Years of experience and level of education influenced the nursing competencies in assessment of diabetic patients.

56(58.3%) nurses did not have knowledge on Glycated Haemoglobin (HBA1C) and could not perform the test.

## Recommendations

* Registered nurses be educated on the effect of stress on diabetes mellitus.
* Additional specialized training for practicing nurses, on Glycated Hemoglobin test in glycemic control for diabetic patients
* Further studies to be done in other counties.

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# APPENDICES

# APPENDIX I: LETTER OF INTRODUCTION

Hello! My name is **Lydiah B. Nyachiro.**

I am a student at Masinde Muliro University of Science and Technology, taking a Master’s Degree in Nursing. I am carrying out a research on clinical competence of nurses in assessment of diabetic patients in selected hospitals in Kisumu County in collaboration with the administrators of those identified hospitals.

Your participation in this study will be aimed at assessing the knowledge and competency of the nurse and knowledge of patients with diabetes and how they take care of diabetic patients. You will be given a questionnaire to fill and it will take you approximately 20 minutes to complete. Your participation in the interview and/or filling the questionnaire will be voluntary. You may choose not to answer any question or participate in the interview. Your refusal to participate or answer the questions will have no effect on your job. The research is being done to help us learn more about the type of diabetic complications one is likely to develop or has developed and prevent them from worsening. We will ask questions in relation to assessment, nature and scope of diabetes mellitus and clinical competence You will be in the study for the period that the study will be conducted, there is risk that the information about you may be known to others outside the study but, there will be protections in place to keep information about your confidentiality, no names will be used, but will use coded numbers. Benefit from the study will be that there will be increased knowledge about the prevention of diabetic complications. Your answers or responses will remain confidential and will not be shared with anyone outside this study. Your name will not appear on the survey.

Nurses working in the medical, surgical and diabetic clinics will be eligible to participate in the study as long as they meet the inclusion criteria.

**Informed Consent Form for Nurses**

Your participation in this study is totally voluntary.You can leave the study at any time for any reason.You can choose not to fill the diabetic self evaluation form or fill the tool.You will not be asked any questions about your own self, but on the knowledge and practice of diabetic care to diabetic patients.Your name and answers to the self evaluation tool will be kept confidential.The researcher and her assistants will be observing you from a distance and you will not know when you are observed.You will be evaluated on knowledge, practice and any other issue related to diabetic patients.Your signature below shows that you have understood the above information and agree to participate in the study.

Print your name:……………………Signature…………………………

Witness…………………………………………………………………………

Date…………………………………………………………………………………

Thank you for your participation

# APPENDIX II: QUESTIONNAIRE

Dear Participant,

This study is being conducted to establish the nurses’ clinical competence in assessing diabetic patients in selected hospitals in Kisumu County.

**Diabetes Self-Administered Questionairre**

Please place a tick along the appropriate response to each statement. Please be as honest as you can in evaluating your knowledge and skills in taking care of patients with diabetes.

**Demographic Data**

1. What is your gender?

Male [ ]

Female [ ]

2. Please specify your age bracket

Below 24 Years [ ]

25 - 29 Years [ ]

30 - 34 years [ ]

35 - 39 years [ ]

40 - 44 years [ ]

45 - 49 years [ ]

Over- 50 years [ ]

3. What is your level of education in nursing? (Tick as applicable)

Diploma [ ]

Bachelors’ degree [ ]

4. For how long have you worked at this clinic/ward? (Please tick appropriate age bracket)

A. 1 to 5 years [ ]

B. 6 to 10 years [ ]

C. over 10 years [ ]

**Diabetic Self-Administered Questionairre on nurses’ knowledge on selected aspects of diabetes**

Please indicate whether the following statements are true or false regarding diabetes mellitus by putting a tick in the appropriate column.

|  |  |  |
| --- | --- | --- |
| **Questions on diabetes mellitus etiology, treatment and complications** | **True** | **False** |
| 1. Diabetes type 1 is caused by inadequate or absolute lack of insulin production. |  |  |
| 1. Inadequate insulin production is secondary to destruction of the beta cells |  |  |
| 3.Patients with type 1 diabetes are dependent on exogenous insulin for survival |  |  |
| 4.Contributory factors to type 1 diabetes include autoimmune mediated response |  |  |
| 5. Diabetes type 2 is idiopathic in nature |  |  |
| 6.Mono therapy is preferred for first agent in the treatment of diabetes type 2 |  |  |
| 7.Dual therapy can be used if monotherapy is not responding well in type 1 diabetes |  |  |
| 8.Diabetes type 1 is caused by a combination of insulin resistance and /or inadequate insulin production. |  |  |
| 9. Being overweight and leading a sedentary life style are risk factors for type 1 |  |  |
| 10 Dual therapy can be used if monotherapy is not responding well in type 2 diabetes |  |  |
| 11.Type 2 diabetes can be managed by diet, exercise and oral hypoglycemic agents. |  |  |
| 12. Hypoglycemic patients present with a blood sugar of 2mmol/l |  |  |
| 13.Blurred vision could be one of the long term complication of diabetes |  |  |
| 14 Diabetic patients are adviced on local indigenous food more so green leafy vegetables to prevent complications |  |  |
| 15.The following are short term diabetic complications Hyperosmolar, hyperglycemic Non ketotic Diabetes Mellitus and retinopathy |  |  |

**Diabetic nurses’ competence checklist**

**Participant Observation Checklist**

The nurse was assessed on performance of the following areas of diabetic care and was rated as good or poor performance depending on the scores.

Nurses’ clinical competence in assessment of diabetic patients

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Objective Two Questions** | **Good performance** | **Poor performance** | **Total** |
| 1 | Patient education on self-care management instructions of a “sick day” |  |  |  |
| 2 |  |  |  |  |
| 3 | Counseling and health education on the various types of diabetes mellitus |  |  |  |
| 4 | Instructions on daily personal care for diabetic patients |  |  |  |
| 5 | Screening services instructions to reduce diabetic complications |  |  |  |
| 6. | Lifestyle modification instructions to diabetic patients |  |  |  |
| 7 | Teaching and demonstration on self-administration of insulin |  |  |  |
| 8 | Instructions on action and effect of insulin administration |  |  |  |
| 9 | Explanation on how stress affects diabetes control |  |  |  |
| 10 | Advice on diabetes mellitus complications |  |  |  |

|  |  |  |
| --- | --- | --- |
| **Diabetic nurses’ competence assessment checklist** | Competent | Not Competent |
| **1.History taking on :** |  |  |
| Drug /food allergies |  |  |
| Duration of illness |  |  |
| Past medical history |  |  |
| Family socio economic history |  |  |
| Medication history |  |  |
| **2.Physical examination and complication assessment on:** |  |  |
| Eyes |  |  |
| Skin |  |  |
| Renal |  |  |
| Foot |  |  |
| Respiratory |  |  |
| Gastrointestinal |  |  |
| Cardiovascular |  |  |
| Neurological |  |  |
| Reproductive |  |  |
| **3.Investigations on:** |  |  |
| Urinalysis |  |  |
| Blood sugar depending on the time either random or fasting |  |  |
| HBA1C (Glycated Haemoglobin) |  |  |
| Hemoglobin |  |  |
|  |  |  |

|  |  |  |
| --- | --- | --- |
| **System /Parameters assessed** | **Competent** | **Not Competent** |
| **Eye**  **History taking on:**   * Eye disease * Blurred vision * Visual loss * Headache * Eye pain * Redness   **Physical examination by:**   * Inspect for symmetry * size * shape * colour * tearing * dryness   Palpate for any   * swelling, * orbital rim   Visual acuity testing using a snellens chart  Fundoscopy for routine eye examination |  |  |
| **Diabetic Foot examination**   * Pain * Numbness * Ulcers |  |  |
| **Neurological**   * Level of consciousness * Mobility * Numbness * Sweating * Tingling sensations * Muscle weakness |  |  |
| **Renal System**  **History on**   * Urinalysis |  |  |

Nurses’Clinical Competence Assessments in the prevention of Diabetic Complications

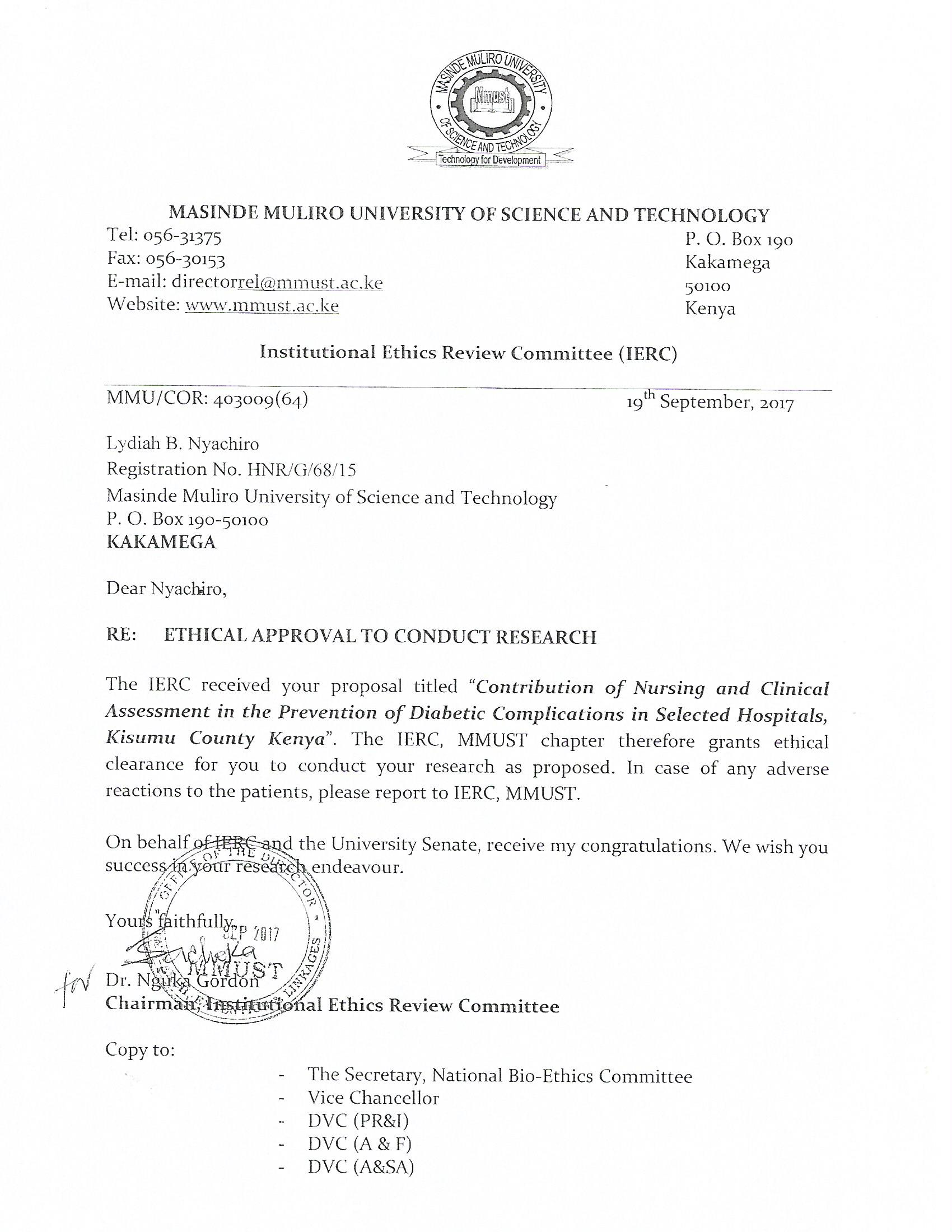
The nurse was observed on the performance on a 10 item checklist on clinical competence and graded as good performance or poor performance depending on the scores.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Clinical competencies** | Good Performance | Poor Performance | Total |
| 1 | Preoperative nursing |  |  |  |
| 2 | Assessing hypoglycemia |  |  |  |
| 3 | Neurologic assessment |  |  |  |
| 4 | Diabetic complications assessment |  |  |  |
| 5 | Nutritional assessment |  |  |  |
| 6 | Blood sugar check monitoring method |  |  |  |
| 7 | Assessing sites for insulin administration |  |  |  |
| 8 | Hyperglycemia without ketosis assessment |  |  |  |
| 9 | Hyperglycemia signs and symptoms |  |  |  |
| 10 | General and focused assessment |  |  |  |

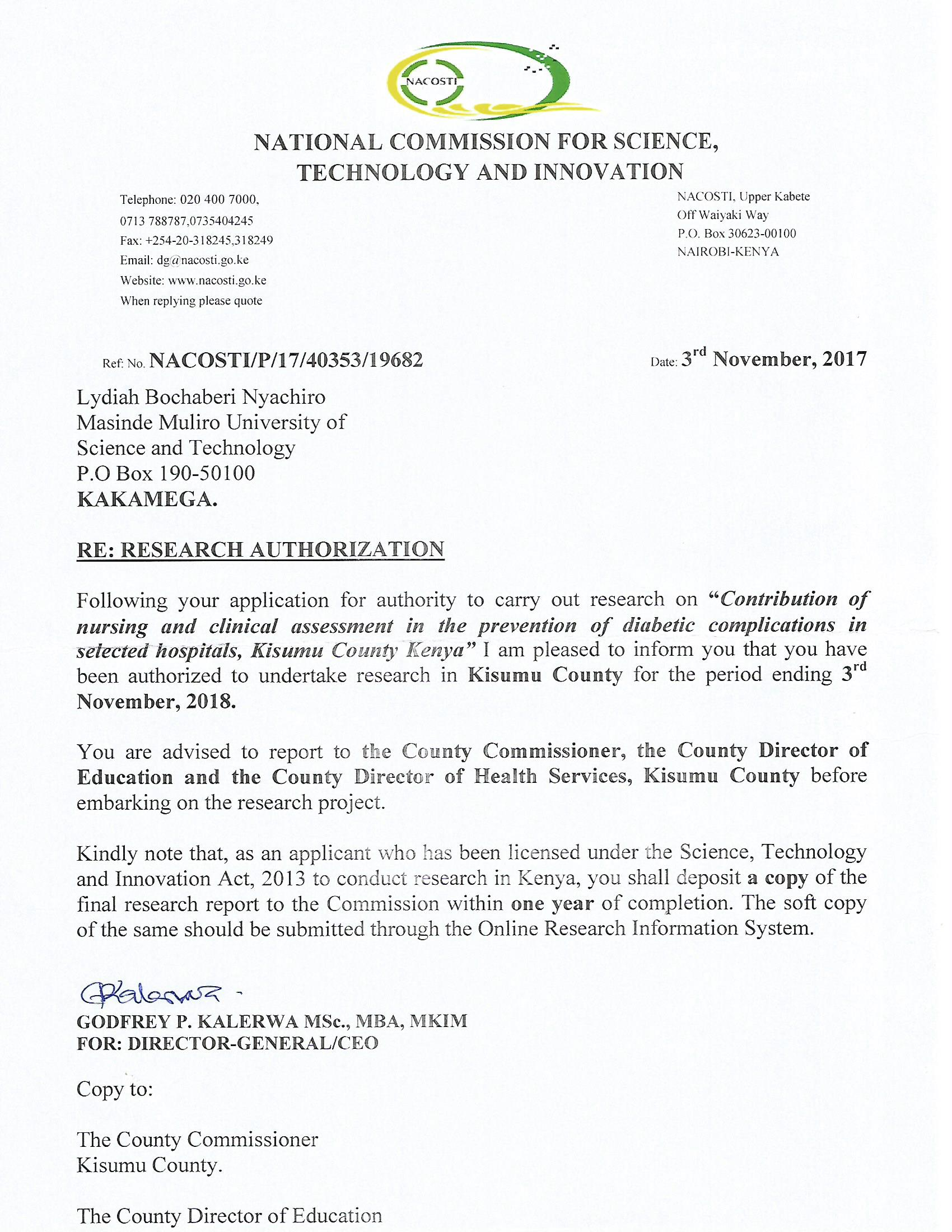
# APPENDIX III: LETTER OF APPROVAL FROM SGS

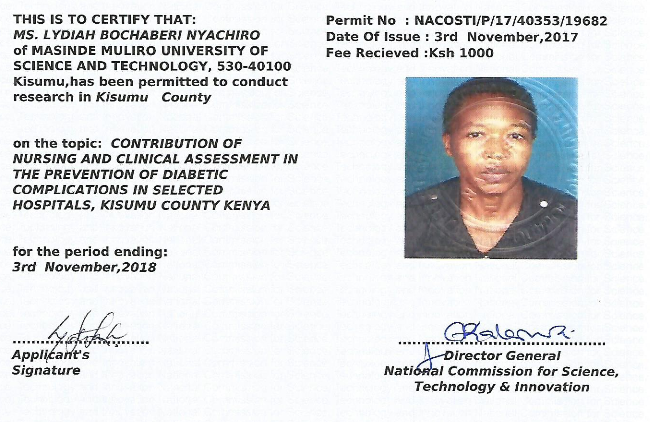
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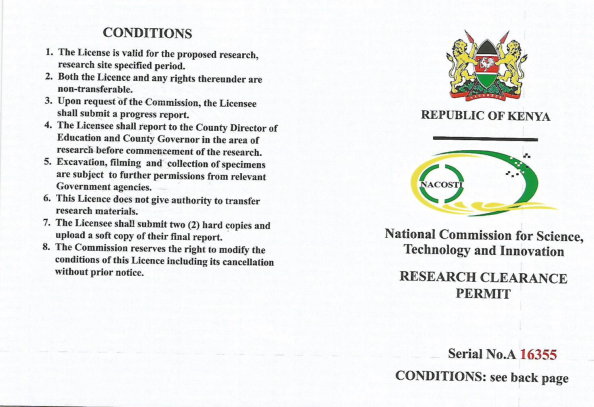
# APPENDIX IV:ETHICAL APPROVAL TO CONDUCT RESEARCH



# APPENDIX V:RESEARCH AUTHORIZATION FROM NACOSTI







# APPENDIX VI: MAP OF STUDY AREA

