ASSESSMENT OF QUALITY OF DIABETES CARE AND TREATMENT IN MWANZA REGION

BY MARY THEODORY MAYIGE

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CERTIFICATION

The undersigned certifies that he has read and hereby recommends for acceptance by the Muhimbili University of Health and Allied Sciences a dissertation entitled "ASSESSMENT OF QUALITY OF DIABETES CARE AND TREATMENT IN MWANZA REGION" in partial fulfillment of the requirements for the degree of Master of Public Health of Muhimbili University of Health and Allied Sciences.



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Date: 05/11/2008

DECLARATION

I Mary Theodory Mayige, Declare that this dissertation is my own original work and that it has not been submitted and will not be submitted to any other University for a similar or any other degree award.



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How ever much I'd like to take credit for the production of this work, it would not have been possible without the enormous contributions from a number of people which made the completion and production of this dissertation achievable.

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DEDICATION

To my family: for supporting me through out my studies.

ABSTRACT

Quality health care to patients with diabetes has been shown to have significant positive patient outcomes as well as reduce overall economic burden on the health care system.

A cross sectional study was conducted to determine the quality of health care provided to patients in Mwanza region .The Type 2 Diabetes Clinical Practice Guidelines for Sub-Saharan Africa, 2006 was used as the recommended standards of care in the study.

Fifteen (94%) health facilities with diabetic clinics in the region were assessed and a total of 411 patients were enrolled in the study. A structured questionnaire and observation methods were used to collect information on structural quality. Process and Outcome quality were assessed using structured questionnaires, physical measurement of patients as well as biochemical measurements.

Results show that facilities had inadequate capacity in health personnel attending to diabetes patients in terms of both quality and quantity. Results also show that most of the health facilities lacked necessary capacity for screening majority of complications. However most had capacity for measuring blood pressure and blood glucose.

Mean Body Mass Index (BMI), Glycosylated Haemoglobin 1c (HBA1c), Fasting Blood Glucose (FBG), Systolic Blood Pressure (SBP) and Diastolic Blood Pressure (DBP) was 25.5kg/m^2, 8.8%, 11.1 mmol/l, 130 mmHg and 80 mmHg respectively. The prevalence of reported complications was high and the overall results show that there is poor glycaemic control among patients.

The study shows that although some of the clinics had some basic facilities for providing diabetes care, the quality of care provided to patients with diabetes has been sub optimal resulting in to poor patient outcome of treatment hence major efforts are needed to improve quality of care provided and consequently patients' outcome of treatment.

DISSEMINATION OF RESEARCH FINDINGS

A copy of the report of the research finding obtained from the study will be provided to; Muhimbili University of Health and Allied Sciences library, Regional Medical Office, Mwanza Region, Tanzania Diabetes Association, and to the National Institute for Medical Research library.

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LIST OF ABBREVIATIONS

AIDS	Acquired Immuno- Deficiency Syndrome
AMMP	Adult Morbidity and Mortality Project
AMO	Assistant Medical Officer
BMI	Body Mass Index
BP	Blood Pressure
CVD	Cardiovascular Diseases
CO	Clinical Officer
DALYS	Disability Adjusted Life Years
DBP	Diastolic Blood Pressure
DDH	District Designated Hospital
ECG	Electrocardiogram
EDTA	Ethylene Di-amine Tetra Acetic Acid
FBG	Fasting Blood Glucose
HBA1c	Glycosylated Haemoglobin 1c
HF	Health facility
HIV	Human Immunodeficiency Virus
IDF	International Diabetes Federation
MoH & SW	Ministry of Health and Social Welfare
MD	Medical Officer
NCD	Non Communicable Diseases
RFTs	Renal Function Tests
SBP	Systolic Blood Pressure
SD	Standard Deviation of the Mean
TB	Tuberculosis
TDA	Tanzania Diabetes Association
WHO	World Health Organization

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DEFINITION OF TERMS

Diabetes- Is a metabolic disease characterized by chronic hyperglycemia resulting from defects in insulin secretion, insulin action or both.

Minimal care- With regards to diabetic care this refers to care that seeks to achieve the major objectives of diabetic care but is provided in settings with very limited resources including drugs, personnel, technology and procedures.

Outcome- These are changes desirable or undesirable in individuals or population that can be attributed to health care e.g. change in health status, change in knowledge or behaviour of patients, patients' satisfaction with the services etc.

Process- These are activities that constitute health care including diagnosis, treatment, prevention, patient education and others.

Quality in health care - Is the product of the science and technology of health care and the application of that science and technology in actual clinical practice.

Standards of care- These are specified quantitative measures of magnitude or frequency that specifies what is good / quality care or less so.

Structure- This is taken to mean the conditions under which care is provided including material resources e.g. facilities and equipments, human resource available, and organizational characteristics.

Treatment goals- These are pre set optimal targets for glycemic (blood sugar levels), blood pressure, and obesity control that have to be reached by a diabetic patient who is being managed at a health care facility.

CHAPTER ONE

1.0 INTRODUCTION

1.1 BACKGROUND INFORMATION

Chronic non communicable diseases like diabetes and hypertension are increasing rapidly in developing countries including Tanzania. These diseases are increasing due to improving socioeconomic conditions leading to socio demographic changes that create a favorable environment for development of chronic non communicable diseases (Unwin et al, 2006).

Communicable diseases still continue to be a challenge to the developing countries despite continued efforts to control them. TB, HIV and Malaria infections are still the major cause of morbidity and mortality (Boutayeb et al, 2005).

The emergence of chronic non communicable diseases in developing countries has created a double burden on the health care service system which is still struggling to deal with the communicable diseases (Gaziano et al, 2006).

Although communicable diseases are still the major health problem and with the limited resource it would seem rational for the developing countries to continue concentrate their resources to control communicable diseases. But research has shown that chronic diseases in developing countries especially diabetes, hypertension, and cancers have reached alarming proportions and calls for immediate action (Unwin et al, 2001). In Tanzania the prevalence of diabetes ranges from 2-4% in urban area with lower prevalence in the rural population and as high as 12% among high ranking officials and the contribution of diabetes to all-cause mortality in adult males was 2.6%, 2.1% and 0.7% in Dar es Salaam Hai and Morogoro Rural districts and in women percentages were 1.7%, 1.8% and 0.2% respectively (AMMP, 1997).

Clinical management of diabetes in most cases is also inadequate as reflected by the high morbidity and mortality. Studies have shown that in developing countries like Tanzania patients with Type I diabetes have short life expectancies and those with type II are often with multiple complications (Beran et al, 2006). A survey conducted at

Muhimbili Hospital, documented a high prevalence of complications and poor glycemic control among children with type I diabetes (Majaliwa et al, 2007). Similar findings have also been reported for type II diabetes.

Tanzania is one of the few countries in Africa known to have made progress in providing health care services for people with diabetes and other chronic diseases like hypertension at its primary health care facilities. Initially chronic diseases were mainly managed at tertiary institutions and a few secondary health care facilities which were ill-equipped to diagnose and provide basic care for such patients, resulting in low diagnosis rates, late diagnosis, high level of complications and patients having to travel long distances to access appropriate care.

At present the Ministry of Health and Social Welfare (MOH&SW) in collaboration with the Tanzania Diabetes Association has established a network of Diabetes clinics in all regional hospitals and in the Lake Zone, the network has extended to primary health care facilities. The overall objective of establishing these diabetes clinics was to strengthen care at health facilities and to improve the referral system. Therefore, in each health facility health care workers were trained (clinicians, nurses and laboratory technicians). Focus in the training was on diagnosis and basic treatment of diabetes as well as patient and public education.

The clinics were also provided with equipment kits containing sphygomanometer, stethoscope, glucometer, height and weight scales, snellens charts and basic tools for foot-care. Supply of medicines and consumables (strips/lancets etc.) was left to be the responsibility of the health care facility (TDA, 2004).

As mentioned above, the overall aim of establishing these clinics was to improve the quality of care provided to people with diabetes and other chronic diseases. How ever quality of care is determined by many factors including the capacity of the health facility infrastructure, the health care provides and the patients themselves. This study sought to determine quality of health care provided to diabetic patients at the established clinics.

The Quality assessment was done using three approaches (Donabedian, 2003) including using structure, process and outcome. These approaches can be used separately or in combination. Use of all the three is the recommended approach since it allows one to obtain a complete picture of quality since each approach provides individual aspect of quality; therefore these approaches were combined to explore several aspects of quality therefore yielding more comprehensive information. The following conceptual framework was used in explaining the factors that affect quality and the assessment of quality in this study.

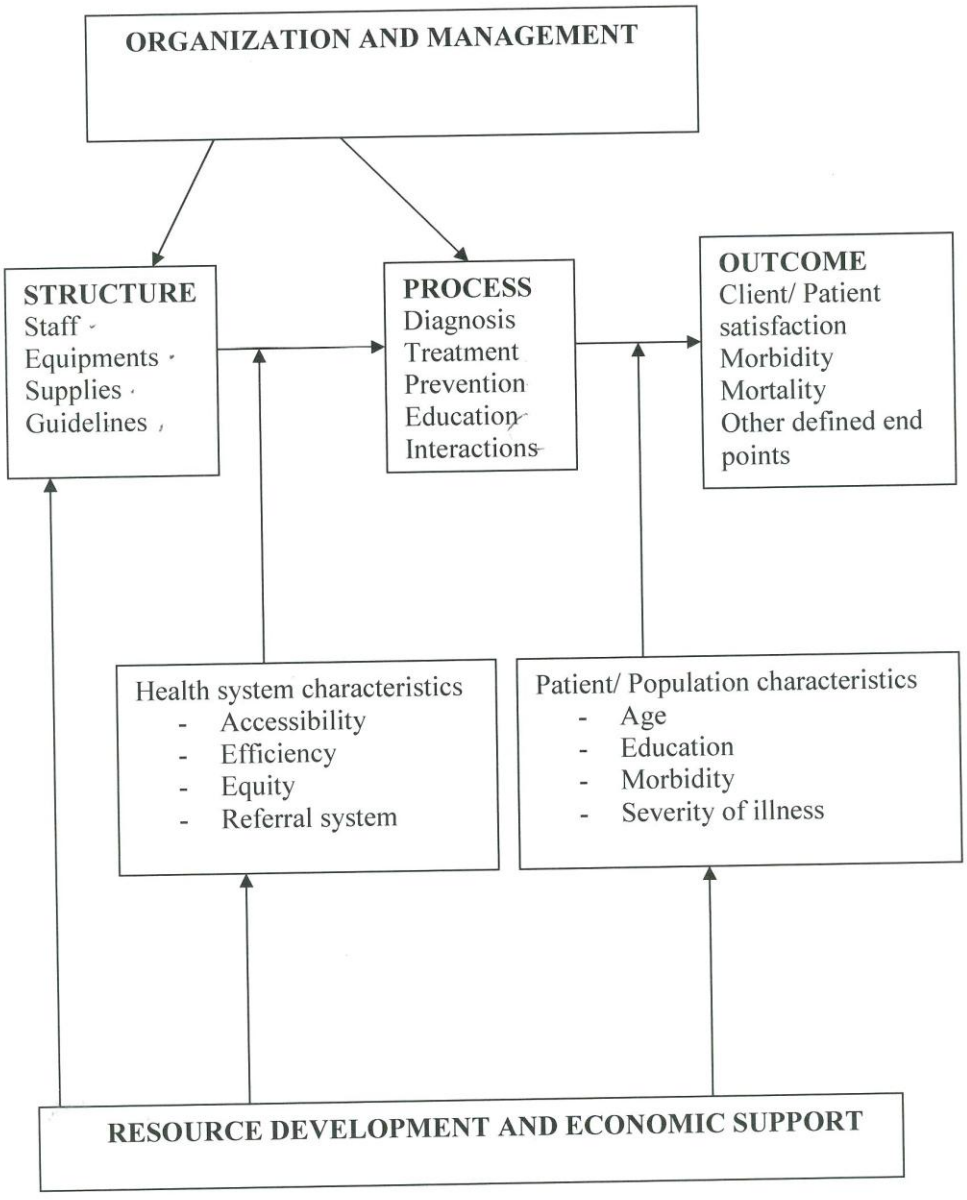


Figure 1: Conceptual framework of factors affecting quality of health care

1.2 DEFINED STANDARDS OF CARE FOR DIABETES

1.2.1 RECOMMENDED MINIMUM CARE

According to the International Diabetes Federation (IDF), the recommended minimum care for type II diabetes includes:

- Screening of diabetes limited to high risk individuals
- Protocol driven care (use of treatment guidelines)
- Screen for complications and other associated conditions once a year (eye, kidney, foot complications, cardiovascular, obesity, erectile dysfunctions) and refer to a higher level health facility if any complications are detected for expert care
- Monitor blood glucose every six months and during acute attacks
- Monitor blood pressure at every visit
- Provide health education to patients regarding, diet, information about their condition, possible complications and desired treatment goals
- Care provided by trained personnel
- Patient records and recall system available for surveillance and to facilitate patient follow up
- Essential drugs available for management of diabetes i.e. oral hypoglycaemics, insulin and anti hypertensives

1.2.2 STRUCTURE QUALITY INDICATORS

- The facility should have trained personnel to provide diabetes care. Trained personnel means a clinician either a Medical Doctor (MD), Assistant Medical Officer (AMO) or Clinical Officer (CO) or a nurse who has received training on management of diabetes.
- The facility should have equipments for measuring blood sugar, height, weight, blood pressure
- The facility should have an up to date registration system and a system of keeping patients records
- Treatment guidelines available

- Materials for patient health education e.g. fliers, information sheets are available

1.2.3 PROCESS QUALITY INDICATORS

- Services for diagnosing diabetes should be available
- Guidelines for management are used in treating patients
- Essential drugs for management of diabetes are available and are provided to the patients
- Screening of complications is done according to schedule and patients are referred accordingly to higher level health facilities
- Patients are provided with health education

1.2.4 OUTCOME QUALITY INDICATORS

Measures used to assess quality in this study were a set of treatment goals that have been shown to be associated with lesser amount of complication. Maintaining value below these points have been shown to be associated with better treatment outcomes. These include;

- Blood pressure of less than 140/90
- Glycaemic control -Fasting blood glucose (FBG) levels of less than 7mmols/l and or Glycosylated Haemoglobin A1c (HBA1c) levels of less than 7% (N.B: HBA1c is a better measure of glycaemic control but not available in resource poor settings, therefore fasting blood sugar levels can be used but varies considerably).
- Body mass index of less than 30kgs/m^2
- Clients' satisfaction with the service was also used as an outcome quality in the assessment.

1.3 PROBLEM STATEMENT

The increasing demand for health care due to non communicable diseases in Tanzania has increased the burden on the already stretched health system due to communicable diseases. Chronic diseases require comprehensive interventions that not only focus on biomedical services but cater for psychosocial complications that arise from being chronically ill. The health care infrastructure needs to provide a continuum of care that will provide services for primary prevention, early diagnosis, routine care, provide care for acute episodes, complications and co- morbidities and be able to provide palliative care for those with terminal illness.

In Tanzania, the overall health system infrastructure has been inadequate in responding to non communicable diseases. The health care facilities often lack the capacity to even provide basic care to patients with chronic diseases like diabetes let alone specialized care. Screening of patients is inadequate and patients usually present with late stages of disease and often have multiple complications.

Poor patient management also leads to increased frequency of acute attacks therefore increases admission rates and consequently increases burden on the health care system. Improving access to quality health care services is of paramount importance in reducing morbidity and mortality due to chronic non communicable diseases. Quality health care to patients with diabetes has been shown to have significant positive patient outcomes as well as reduce overall economic burden on the health system

In responding to the problem the MOH & SW established a network of diabetic clinics that caters for diabetic patients in order to improve accessibility and availability of services, but the quality of services offered in these clinics is still unknown. This study therefore sought to determine the quality of health care provided to patients with diabetes and also to uncover the major determinants of quality in these health care settings using the analytical framework shown in **figure 1** above.

1.4 RATIONALE FOR THE STUDY

Tanzania is one of the countries in sub-Saharan Africa that has made substantial progress as far as non communicable diseases including diabetes are concerned. Research has been done and has shown growing magnitude of the problem with prevalence of diabetes ranging from 2-4% in urban settings.

Research which has been done has mainly focused on creating awareness of the magnitude of the problem but there has been little focus on health service provision. With the scaling up of service provision for people with diabetes there is need to conduct a study to provide information on the quality of health care that is being provided, the information obtained will be useful in improving the quality of diabetes care in the country.

1.5 OBJECTIVES OF THE STUDY

1.5.1 BROAD OBJECTIVE

To determine the quality of health care provided to patients with diabetes attending diabetes clinics in Mwanza Region.

1.5.2 SPECIFIC OBJECTIVES

1. To assess structural quality for provision of diabetic care
2. To assess process quality for provision of diabetic care
3. To assess outcome health care in terms of attaining treatment goals
4. To assess patients' satisfaction with the services provided
5. To assess patients costs associated with the services

1.6 RESEARCH QUESTION

The main research question is; to what extent is the health care provided to diabetic patients conforms to the standards of health care provision for diabetes?

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 GROWING BURDEN OF DIABETES AND OTHER CHRONIC DISEASES

Diabetes is one of the chronic diseases that are becoming more prevalent in developing countries like Tanzania (Reed et al, 2001). Chronic Non-Communicable Diseases (NCDs) are defined as illnesses that are prolonged, do not resolve spontaneously and are rarely cured completely.

From time immemorial, communicable diseases have been the main causes of morbidity and mortality around the world. After the second World War, with medical research achievements in terms of vaccination, antibiotics and improvement in life conditions, demographic and epidemiological transitions occurred, people were no longer dying of infectious diseases and with improvement in social economic conditions NCDs emerged and started causing major problems in developed countries (Boutayeb, 2005).Cardiovascular diseases, cancer, diabetes, chronic pulmonary and mental diseases became a real burden for health systems in developing countries. For a while, these diseases were associated with socio-economic development and so called diseases of the rich (Boutayeb et al, 2005, Gaziano et al, 2007).

However, it has now been recognized that diabetes and other chronic conditions are not only diseases of the rich but causes significant morbidity and mortality in developing countries (Unwin et al, 1999, Unwin et al, 2001). Further more it was predicted that by 2002 chronic diseases like diabetes and hypertension would account for 80% of global burden of disease, causing 70% of deaths in developing countries (WHO, 1988).

This report also estimated that in Africa chronic diseases would have caused 23% of all deaths by 2005. The report also projected that within ten years deaths due to Diabetes would have increased by 42% (WHO, 1988). A study done to assess the growing burden of chronic diseases to the health care system in Tanzania found that among women diseases categorized as chronic account for 75% of deaths and 83% of DALYs.

Among men, chronic diseases account for 64% of deaths and 96% of DALYs (Setel et al, 2004). Data from The Adult Morbidity and Mortality Project (AMMP) showed that NCDs account for 15-20% of all adult deaths (25-59 years).

2.2 RISK FACTORS FOR DIABETES AND OTHER CHRONIC DISEASES: THE SITUATION IN TANZANIA

Major groups of chronic NCDs like diabetes mellitus, cancers, cardiovascular diseases (CVDs), and chronic respiratory diseases, have common risk factors that are lifestyle-related (Boutayeb & Boutayeb, 2005). These are unhealthy diet, tobacco use, excessive alcohol consumption and physical inactivity.

These risk factors for diabetes, CVDs, cancer, and pulmonary diseases are due to lifestyle and can be prevented. Physical inactivity, western diet, and smoking are prominent causes (Alberti et al, 2001).

Studies done in Tanzania have shown that important risk factors for developing chronic diseases are obesity, alcohol consumption, smoking, and high blood pressure. Data from a study done in Temeke district in Dar es Salaam, Tanzania showed that the prevalence of obesity among women was as high as 20% in the 45-54yrs age group (Bovet et al, 1999).

Another study conducted in Dar es salaam which is an urban setting showed high prevalence of hypertension, obesity and smoking among Dar es Salaam residents (Bovet et al, 2002), however the situation was different for rural populations where the prevalence of risk factors was found to be low (Swai et al, 1993).

Similar trends in the prevalence of risk factors has been reported by MOH&SW risk factor survey (MOH&SW 2007), however with the growing rate of urbanization these problems are likely to extend to rural areas.

2.3 PREVALENCE OF DIABETES IN DIFFERENT COMMUNITIES IN TANZANIA

Diabetes mellitus being a lifestyle related disease varies greatly between populations following the pattern of the related risk factors that is obesity, alcohol consumption, smoking, and sedentary life, therefore diabetes prevalence is higher in urban settings and markedly higher in those of higher socio-economic status.

Table 1 below represents data from the Adult Morbidity and Mortality survey, 1997. Recent surveys have shown that the prevalence of diabetes in urban settings ranges from 2- 4% (MOH &SW, 2007).

Table 1: Prevalence of Diabetes among Different Communities in Tanzania

Community	Prevalence of Diabetes
Mara	0.6
Kilimanjaro	0.7
Morogoro	0.8
Urban Africans (Dar es salaam)	1.0
African Nuns (Dar es salaam)	4.3
Ithna- Asheri Asians (Dar es salaam)	8.8
Hindu Asians (Dar es salaam)	9.8
African Priests (Dar es salaam)	10
Bohra Asians (Dar es salaam)	11
African Executives	12

2.4 ESSENTIAL COMPONENTS OF DIABETES CARE

An effective health care system is essential to be able to provide all essential health care services, for reducing morbidity and mortality due to diabetes, as well as improving the quality of life and productivity of people living with diabetes. The essential components of care (IDF, 2006) include:

- **Treatment of hyperglycemia**; which can be either pharmacological by use of Insulin and oral glucose lowering agent or both, or non pharmacological including education, diet, physical activity and other lifestyle modifications.
- **Treatment of hypertension and abnormal lipids**; which can be either pharmacological by using lipids lowering agents and antihypertensives, or non pharmacological including education, diet, physical activity and other lifestyle modifications.
- **Prevention and treatment of complications**; through early diagnosis and treatment, patient education, and regular screening for complications.

2.5 EXISTING HEALTH SYSTEM INFRASTRUCTURE FOR PROVISION OF DIABETES CARE IN TANZANIA

It is clear that Tanzania is not exempted from the growing burden of chronic NCDs including diabetes. With the increasing improvement of socioeconomic conditions the situation is likely to get worse especially in the urban areas. Despite the growing burden the health care system remains ill equipped to respond to the growing burden of chronic diseases like in many other African countries (Whitting et al, 2003).

In response to the growing burden of NCDs including diabetes WHO called for action for the developing countries to improve health care services to cater for chronic conditions by integrating them into the primary health care package. The guiding principles put forward for establishing an effective health care system for chronic conditions include; evidence based decision making, focus on the population rather than individual patients, focus on prevention, and focus on quality right from the policy level.

The services should also be integrated at all levels of health care from the basic unit i.e. community level to the national level and lastly surveillance, monitoring and evaluation system should be part and parcel of the health care framework (WHO 2002).

Before this call was made Tanzania had already made some progress is setting up a health system infrastructure for managing chronic conditions. Tanzania is one of the countries in Africa to have made progress in providing health care services for people with diabetes and other chronic diseases like hypertension at its primary health care facilities.

Initially, these diseases were mainly managed at tertiary institutions and a few secondary health care facilities which were ill-equipped to diagnose and provide basic care for such patients, resulting in low diagnosis rates, late diagnosis, high level of complications and patients having to travel large distances to access appropriate care.

At present there is a network of diabetes clinics which was established by the Tanzania Diabetes Association (TDA) in collaboration with the MOH&SW in all regional hospitals throughout the country, and in the Lake Zone the network has extended to primary health care facilities. The overall objective of establishing these clinics was to strengthen care at health facility level and to improve the referral system.

Therefore in each health facility, health care workers were trained (clinicians, nurses and laboratory technicians). Focus in the training was on diagnosis and basic treatment of diabetes as well as patient and public health education.

The clinics were also provided with equipment kits containing sphygmomanometer, stethoscope, glucometer, height and weight scales, snellens charts and basic tools for foot-care. Supply of medicines and consumables (strips/lancets etc.) was left to be the responsibility of the health care facility (TDA, 2004).

The social and economic burden of diabetes is remarkable being a chronic disease. Tanzania being a poor country, there is little resources allocated to chronic diseases like diabetes. Currently the diabetes clinics are getting support from TDA through some

external supporters. Although the country's policy is patients with chronic diseases are exempted or subsidized the patients are still faced with a burden of having to finance their health care hence may lead to irregular clinic attendance and some may not attend at all therefore increasing morbidity and mortality.

Despite the challenges evidence has shown that well organized diabetic clinics with appropriately trained staff improve the quality of diabetes care and consequently improve patients' outcome.

2.6 QUALITY OF DIABETES CARE IN OTHER HEALTH CARE SETTINGS

The chronic nature of the disease makes it particularly difficult to manage as it requires stringent control of glycaemic levels blood pressure as well as continuous monitoring and screening of complications Studies like the UK Prospective Diabetes Study (UKPDS) have demonstrated that quality diabetes care reduces both the morbidity and mortality due to diabetes.

Studies done in low and middle income countries to assess the quality of diabetes care have shown that attainment of optimal treatment goals is a challenge in terms of blood glucose, blood pressure and BMI control. A study done in Tunisia (Harzlla et al, 2004) has shown that only about 23% were able to attain HBA1c levels of < 7% and poor glucose control was seen in about 61% of patients, about 40% had normal blood pressure levels and only about 16% had a BMI of less than 25kg/m^2.

A study done in Nigeria (Kolawole et al, 2005) showed that about 44% of their study population had managed to attained good glycaemic control. Results of the Delhi Diabetes Community (DEDICOM) survey show that the prevalence of patients with poor glycaemic and blood pressure was about 43% and 40% respectively.

Findings from studies have also demonstrated that adherence to the treatment guidelines to be a challenge as the evaluation of the processes of care have shown that percentages of patients having the process of care measures like blood pressure, blood sugar and

BMI measurements as well as renal function tests (RFTs), electrocardiogram (ECG) cholesterol, foot examinations and fundoscopy to be sub optimal.

For example in the study by Harzlla et al, 2004, the proportion of patients who had had their feet examined and documented was 5%, ECG was done in only about 24%, fundoscopy in about 20%, and RFTs were done in only about 20%. Comparable findings have been reported by other similar studies (Alberti et al 2007, DEDICOM survey 2006, Wendy et al, 2006)

Although findings from these studies which have evaluated quality of care provided to diabetic patients in other developing countries have shown that improvement regarding patients outcome to be a challenge, they have demonstrated significant improvement in terms of the human resource capacity and in the provision of health care services (Harzlla et al 2004, Alberti et al 2007, Kolawole et al 2005).

With several initiatives to improve care for chronic diseases and the increased awareness among the policy makers there is hope that there would be more resources directed towards control and treatment of chronic diseases, and with continuous quality improvement initiatives there is room to improve the quality of care that is being provided and subsequently improve the outcome of treatment in terms of patients being able to attain the treatment goals

CHAPTER THREE

3.0 METHODOLOGY

3.1 STUDY TYPE

The study is cross sectional, both descriptive and analytical. The study was carried out to assess the quality of care for people with diabetes in different health facilities. An assessment of structure, process and outcome with respect to quality of care was carried out. The current treatment guidelines used i.e. Type 2 Diabetes Clinical Practice Guidelines for Sub-Saharan Africa, 2006 was used for this study as the recommended standards of care.

3.2 STUDY AREA

The study was conducted in Mwanza Region at different levels of health care. Mwanza Region was chosen strategically because activities to strengthen health care for people with chronic diseases like diabetes for example the Essential Health Care Package and Improving Access to NCD Care projects have been implemented in this region. The region has eight districts namely Ilemela and Nyamagana which make up Mwanza municipal, Misungwi, Geita, Ukerewe, Kwimba, Magu and Sengerema.

3.3 STUDY PARTICIPANTS

Data was collected from health facilities, health care providers and patients

3.4 DATA COLLECTION TECHNIQUES

Structured questionnaires were used to capture information about structure process and outcome quality from patients and key respondents from health facilities. Physical measurements were done including blood pressure using a sphygmomanometer, weight using a weighing scale, height using a height measuring scale and fasting blood sugar levels using a glucometer to assess outcome quality as well as HBA1c measurements. Data was collected over a period of three weeks.

Blood pressure

Blood pressure was measured in the right arm with a mercury sphygmomanometer with the patient seated after the patient had been made to rest for about five minutes.

Weight and height

Height and weight were measured without shoes or coats or any heavy clothing and with the patient standing in an upright position.

Blood sugar and HBA1c

Blood sugar measurements were done on site using Glucoplus® strips after obtaining blood from a finger prick. About 2mls venous blood for HBA1c was drawn from patients after obtaining consent, the blood was kept in EDTA® bottles and kept in cold temperature using ice packs during transportation from the site to Bugando hospital where the analysis was done.

3.5 STUDY VARIABLES

The study explanatory variables include both numerical and categorical variables and they are in three broad categories namely, patient variables e.g. socio-demographic characteristics, duration of illness, type of medication etc. Others include process of care variables e.g. availability of medications, screening of complications, training of health care providers, and use of treatment guidelines for managing patients with diabetes. The other category of explanatory variables are organizational variables e.g. laboratory capacity, clinic structure, availability of equipments and others. The outcome indicators in this study i.e. FBG, HBA1c, BMI, patient satisfaction with the services provided are the dependent variables.

3.6 STUDY SAMPLE

3.6.1 SAMPLING

A multi-stage sampling procedure was applied. The first phase of sampling was to select health facilities. A sample of health facilities was selected from a list of health facilities which had established diabetic clinics. All hospitals and health centers and dispensaries with diabetes clinics of Mwanza Region were included in the survey.

The second sampling stage was selection of patients. Patients were to be selected systematically using a list of patients booked for appointment for the day of visit provided by each clinic but all the patients were enrolled due to small number of patients attending the clinic per day. However all the patients had a chance of being selected because the selection of who should attend when is a random phenomenon therefore minimizing the chance of bias. A third of the patients were selected for HBA1c measurement. A sampling interval of 3 was used there fore every 4th patient was enrolled for the test.

3.6.2 SAMPLE SIZE

Health facilities: All health facilities having established diabetes clinics in Mwanza Region

Patients:

Sample size was calculated using the following formula:

$$n = \frac{Z^2 p(100-p)}{E^2}$$

Where

z= level of confidence (1.96 for 95% confidence level)

p = expected proportion of patients who reach treatment goals (from previous studies)

ε = margin of error

Assuming the average proportion of diabetic patients attending Diabetes clinics reaching the pre set treatment goals is 44%

Allowing for a margin of error of 5%, with z value of 1.96, the calculated sample size is:

$$n = \frac{(1.96)^2 * 44\ (100-44)}{5}$$

n= 378

At least 380 respondents

3.7 DATA COLLECTION

Data collection was done by research assistants who were conversant with performing the physical measurements identified in the study to minimize errors. The research assistants were also trained on the methodology and the research instruments before going to the field. In addition, data was collected under close supervision of the principal investigator. The actual number of patients enrolled in the study was 411 respondents. This was the number of patients obtained at the different clinics during the estimated time period for data collection which was three weeks.

3.8 DATA PROCESSING AND ANALYSIS

Data was entered using Epi data software cleaned and analyzed STATA version 8, and Microsoft excel. Descriptive analysis was done by univariate analysis to generate frequency tables. Cross tabulation of dependent and independent variables was done, Chi square test was used to describe associations between dependent and independent variables. P-value and 95% confidence intervals were used to assess the strength and statistical significance between variables. Correlation and regression analysis were also done to examine factors that influence patients to meet treatment goals

3.9 ETHICAL CONSIDERATION

Ethical clearance was sought and obtained from the Muhimbili University of Health and Allied Sciences ethical review board. Informed oral consent was also sought from study participants before they are enrolled into the study. Participants were explained on the objectives of the study and what will be the benefits of participating in the study, and that there were no anticipated risks in participating in the study and that participation was entirely their choice, and they could withdraw their consent at any time during the interview Physical measurements were done in accordance with the clinical guidelines, confidentiality and privacy of those participating in the study was ensured. Patients were explained of the procedures and why they were being done before being subjected to any measurements and feedback regarding the results obtained was given at the same sitting or patients were advised to follow up on their results on subsequent visits.

CHAPTER FOUR

4.0 RESULTS

4.1 HEALTH FACILITIES WHICH HAD ESTABLISHED DIABETES CLINICS

The table 2 below shows a list of health facilities that had been registered as having diabetes clinics in Mwanza Region. All the facilities were sampled to be enrolled in to the study since they were few. Fifteen (94%) of the health facilities were assessed to determine the capacity of each of the health facilities to provide diabetes care as well as to assess the quality of care provided.

Table 2: Health facilities with diabetes clinics in Mwanza Region

Health facility	Level	Ownership	Assessed
Bugando Medical Centre	Referral hospital	Faith based	Yes
Sekou Toure	Regional hospital	Government	Yes
Magu	District hospital	Government	Yes
Sengerema	District hospital	DDH	Yes
Ukerewe	District hospital	Government	Yes
Misungwi	District hospital	Government	Yes
Geita	District hospital	Government	Yes
Kwimba	District hospital	Government	No
Aga Khan	Health centre	Private	Yes
AICT Makongoro	Health centre	Faith based	Yes
Tumaini	Health centre	Private	Yes
SDA Pasiansi	Dispensary	Faith based	Yes
Military	Hospital	Military	Yes
Mwananchi	Health Centre	Private	Yes
Hindu Union	Hospital	Faith based	Yes

4.2 DEMOGRAPHIC AND OTHER CHARACTERISTICS OF THE RESPONDENTS

A total of 411 patients were involved in the study, of these 222(54%) were males and 189 (46%) were females. The mean age of female respondents was 51.6 years (SD 13.40) and the mean age for males was 51.9 years (SD 15.12), there was no significant difference in the age distribution between males and females (p value > 0.05).

With respect to marital status 336(81.8%), of the patients were married, 25 (6.1%) were single, 13 (3.2%) were divorced and 37 (9%) were widowed.

Most of the patients 349(84.9%) had had some form of education. Most of which (66.4%) had completed primary school, 15.8% had secondary school education, 0.7% had vocational training, and 2% had university level education. Those who had never gone to school, about 62 patients comprised 15.1%.

About half of the patients 202 (49%) were farmers, 64(15.6%) patients had no source of income, 47 (11%), 45 (11.2%) were government employees, 20(4.9%) were unskilled labourers, 10(2.4%) had irregular income obtained for example by farming on borrowed land, and 23 (5.6%) had other sources of income like fishing.

Regarding duration of illness, about half of the patients 201 (49%) had been diagnosed within the last three years, 132 (32%) of patients were diagnosed within the last 4-7 years, 36 (8.8%), were diagnosed 8-10 years ago and 40(9.8%) were diagnosed more than ten years ago.

Of the 411 patients, 67.6% were being treated with oral hypoglycaemics, 29.4% were on insulin and 2.9% were on non pharmacological treatment that includes weight reduction, exercise and diet counseling.

Family history of diabetes was positive in 85 (20.7%) of patients. Proportion of smokers and those taking alcohol among these patients was 3.2% and 11% respectively.

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Table 3: Basic Characteristics of Respondents (n=411)

Characteristics	Frequency	Percent
Age group (Years)		
> 20	12	2.9
21-30	24	5.8
31-40	49	11.9
41-50	103	25.1
51-60	116	28.2
> 60	107	26
Sex		
Male	222	54
Female	189	46
Marital status		
Married	336	81.8
Single	25	6.1
Divorced	13	3.2
Widowed	37	9
Education level		
Primary education	273	66.4
Secondary education	65	15.8
Vocational training	3	0.7
University education	8	2
Other	62	15.1

Characteristics	Frequency	Percent
Source of income		
No source of income	64	15.6
Irregular income	10	2.4
Unskilled laborer	20	4.9
Farmer (own land)	202	49.2
Trader	47	11.4
Civil servant	45	11
Other	23	5.6
Duration of illness(years)		
≤3	201	49.1
4-7	132	32.8
8-10	36	8.8
>10	40	9.8
Type of medication		
Non pharmacological	12	2.9
Oral hypoglycaemics	278	67.6
Insulin	121	29.4
Family history of diabetes		
Yes	85	20.7
No	318	77.4
Don't know	8	2
Smoking status		
Yes	13	3.2
No	398	96.8

Table 3 continued

4.3 STRUCTURAL QUALITY FOR PROVISION OF DIABETIC CARE

4.3.1 NUMBER OF HEALTH PERSONNEL TRAINED TO PROVIDE DIABETES CARE

Results show that the mean number of clinicians providing care per facility was 1.40 (SD 0.7) and the mean number of those trained was 1.14 (SD 0.5). The number of nurses varied across facilities with the mean number of 1.40 (SD 1.2). Some of the health facilities had no nurse at its diabetes clinic while others had up to four nurses. The mean number of nurses trained was 1.30 (SD 0.7). None of the clinics had a dietician, diabetic educators or chiropodist, therefore diet counseling; diabetic education and foot examinations are performed mainly by nurses and also the attending clinicians.

4.3.2 AVAILABILITY OF EQUIPMENTS

For a diabetic clinic to function properly, the following (Table 4) were proposed as the minimum equipments needed for establishing and running a diabetic clinic. Each of the health facility visited was supported by Tanzania Diabetes Association and was provided with a starter pack that contained most of the following equipments in 2005.

Table 4 below gives a summary of the proportion of health facilities that have functioning equipments in their clinics at the time the study was conducted. Results show that most of the health facilities (80%) had equipments for measuring blood glucose, as well as equipments to monitor blood pressure (Sphygmomanometer (93%) and stethoscope (80%). They also have the capacity to monitor their patients' body mass index.

However, many lacked emergency treatment trays, equipments for foot examination and for eye examination i.e. ophthalmoscopes and snellens charts. Clinical practice guidelines were found in 2 out of 3 clinics visited mostly kept in storage and the same applies to patient registers. Lack of special clinic rooms was also found in many of the health facilities and this has a bearing on the organization of the clinic.

Table 4: Proportion of health facilities that have functioning equipments

Equipments	% of Health facilities with functional equipments (n=15)
Clinic room(s)	40
Near by toilet	66.7
Doctors table	80
Nurses table	46.7
Examination couch with sheets	80
Storage cupboard/ cabinet	40
Clinical practice guidelines	66.7
Fridge for storing insulin	86.7
Tape measure	40
Weighing scale	86.7
Height measure	86.7
Sphygmomanometer	93.3
Stethoscope	80
Monofilament(tuning fork)	26.7
Emergency treatment tray	13.3
Patient registers	73.3
Glucometer	80
Ophthalmoscope	60
BMI calculator	13.3
Snellens Chart	60
Educational materials	33.3

4.4 PROCESS QUALITY FOR PROVISION OF DIABETIC CARE

4.4.1 PATIENT CLINIC ATTENDANCE

Patients were being seen at the clinic on a regular basis, most of the clinics gave monthly appointments with exception of few which gave their patients who have shown consistent good glycaemic control appointments to come for follow up every two to three months. Majority of the patient attendances, (94.4%) are for routine follow up as shown in table 5 below.

Table 5: Patients reasons for attending clinic during the last visit

Reason for consultation	Number (n=411)	Percent %
For follow up	388	94.4
Acute emergency	6	1.4
Blood pressure control	3	0.7
Treatment of complications	14	3.4

Patients are able to adhere to their appointment schedule as evidenced by table 6 below. Most patients 359 (87.4) attend diabetic clinics monthly followed by every 3 months 39(9.5%) patients. Less than 5% of patients pay irregular visits to the clinic.

Table 6: Frequency of attending the clinic in a Year

Frequency	Number (n=411)	Percent %
Monthly	359	87.4
Every 3 months	39	9.5
Every 6 months	8	2
Other	5	1.2

4.4.2 CAPACITY OF LABORATORY SERVICES

Results show that all the health facilities visited had a laboratory within the health facility and the table 7 below summarizes the capacity of the laboratories in performing different laboratory tests. Most of the laboratories (93.3%) could perform capillary blood glucose measurements and all (100%) could perform urine analysis.

Capacity to perform lipid profile and renal function measurements were limited with only a third of all the health facilities being able to perform the tests and in the region only one health facility which is the referral hospital has a machine for measuring Glycosylated hemoglobin levels (see table 7).

Table 7: Capacity of the health facility laboratories

Laboratory test	**% of health facilities with laboratory capacity to perform the test (n=15)**
Venous blood glucose	13.3
Capillary blood glucose	93.3
Glycosylated hemoglobin	6.7
Lipid profile	26.7
Serum creatinine	33.3
Urinalysis	100

4.4.3 AVAILABILITY OF ESSENTIAL DRUGS FOR MANAGEMENT OF DIABETES

Availability of drugs varied across different health facility as well as the type of medication. Table 8 below summarizes the proportion of health facilities with at least constant supply of the essential drugs. The commonly used oral hypoglycaemics Glibenclamide and Metformin were available in 60% and in about 73% of the health facilities respectively where as the commonly used antihypertensives e.g. Lasix, Aprinox, Propanolol, Nifedipine and Atenolol were available in more than 80% of the clinics.

Table 8: Drug availability in health facilities visited (n=15)

Drug name	% of HF with drugs available in constant supply
Glibenclamide	60
Chlorpropamide	93.3
Glipizide	6.7
Tolbutamide	13.3
Metformin	73.3
Rosglitazone	0
Lasix	93.3
Aprinox	86.7
Aldomet	66.7
Propanolol	93.3
Nifedipine	93.3
Captopril	73.3
Enalapril	26.7
Losartan	60
Atenolol	80

4.4.4 SCREENING FOR COMPLICATIONS

Screening of complications was assessed as one of the components of the process of care, Table 9 below summarizes the proportion of patients who have been screened for complications. Overall results show that screening for blood pressure and obesity in patients with diabetes is just above average with about 77% and 74% of patients screened. And screening for other complications like for cardiovascular, renal and foot complications has been notably low mostly with coverage of below 10%.

Table 9: Proportion of patients screened for complications in the last one year (n=411)

Procedure	Number of patients screened	Percent %
Dilated eye examination	75	18.3
Blood pressure measurement	316	76.9
Height measurement	270	65.7
Weight measurement	302	73.5
Urinalysis	254	61.8
ECG	35	8.5
Serum creatinine measurement	24	5.8
Lipid profile measurement	20	4.9
Foot examination	41	10
Dental examination	23	5.6

4.4.5 HEALTH EDUCATION

Health education is an important aspect of diabetes care. It is recommended that health care providers provide health education to patients regarding their condition, diet, possible complications, and treatment and to communicate with their patients about the desired treatment goals. Below is a figure of some examples of the education materials found at one of the diabetic clinics that are used to provide health education on diet and insulin storage for patients on insulin who do not have access to refrigerators.

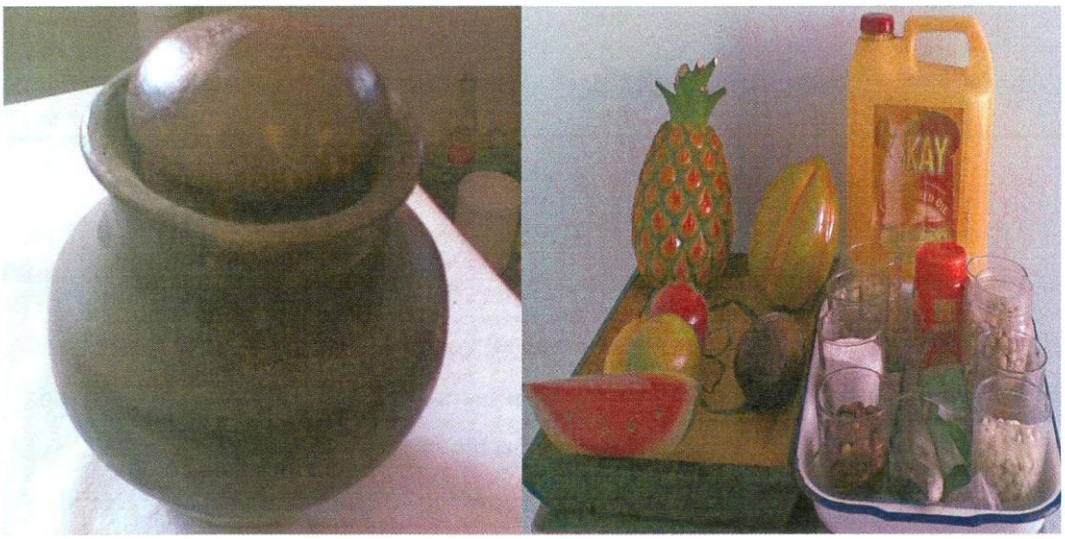


Fig2: Some of the health educational materials used for health education. Picture shows traditional pot for insulin storage and diet demonstration materials.

Table 10 below summarizes findings of the proportion of patients who feel confident about the information they received on different aspects of diabetic health education. More than 60% of patients feel that they were provided with adequate information.

Coverage was higher for advice on diet, treatment and exercise with about 88%, 87%, 81% patients reporting having received adequate information respectively. However coverage was lower for health education on foot care and on diabetes complications with about 61% and 69% respectively.

Table 10: proportion of patients provided with health education/ adequate information on the following in the last one year.

Subject area	Number of patients (n=411)	Percentage %
Diagnosis	310	75.4
Advise on diet	362	88.1
Smoking and diabetes	293	71.3
Exercise and diabetes	332	80.8
Alcohol	306	74.5
Diabetes complications	285	69.3
Treatment of diabetes	357	86.9
Foot care	252	61.3

4.5 PATIENTS' DIRECT COSTS ASSOCIATED WITH THE SERVICES

4.5.1 MODE OF PAYMENT

About 279(68%) of patients had to pay for services the remaining others were exempted. Table summarizes the mode of payment used by patients when accessing diabetic care. About half of the patients (47%) use out of pocket mode of payment.

Table 11: Patients' mode of payment for services

Mode of Payment	Number (n=411)	Percentage %
Out of Pocket	191	46.5
Insurance	68	16.6
Exempted	142	34.5
Other	10	2.4

4.5.2 ESTIMATED MONTHLY COST

The drugs are provided at no cost if they are available in public health facilities but at a cost in private health facility. The price of the drug per tablet ranges between 100-300Tshs per tablet, summing up to 3000-9000 Tshs per months for a patient using a single tablet a day.

The cost of insulin ranged between 3000Tshs to 10,000Tshs per vial translating to 12,000Tshs to 40,000Tshs per month for a patient using 4 vials of insulin each month. The mean transportation cost per visit was 5000 Tshs with a minimum of 300Tshs and a maximum cost of 50,000Tshs.

4.6 PATIENTS' SATISFACTION WITH THE SERVICES PROVIDED

Besides looking at quality of care in terms of the capacity of health facilities to provide care, process of care and also looking at patients outcome of treatment in terms of treatment goals, patients were asked of their opinion regarding the quality of care provided different aspects.The patients were asked to rate their satisfaction with the services provided, table 12 below summarizes the findings the overall rating lie between very satisfied and somewhat satisfied. The rating being higher for amount of information provided about their condition and less satisfaction with availability of medication.

Table 12: Patient rating of level of satisfaction with services provided

	Rating*	
Item description	**Mean**	**SD****
Services provided at reception	3.58	0.73
Amount of time spent to be seen	3.40	0.85
Consultation time	3.47	0.84
Relationship with health care providers	3.70	0.61
Amount of information provided about condition	3.68	0.63
Laboratory services	3.67	0.68
Availability of drugs	3.33	0.76
Overall rating of quality of care	3.61	0.62

**Rating scale: 4 = very satisfied, 3= somewhat satisfied, 2=somewhat dissatisfied, 1= very dissatisfied*

*** Standard deviation*

4.7 OUTCOME HEALTH CARE IN TERMS OF ATTAINING TREATMENT GOALS

Assessment of outcome of care was based on the following recommended treatment goals, and results are presented in terms of the proportion of patients who have attained these goals.

- Blood pressure of less than 140/90
- Glycemic control -Fasting blood sugar levels of less than 7mmols/l
- HBA1c levels of less than 7%
- Body mass index of less than 30kgs/m^2

4.7.1 BLOOD PRESSURE CONTROL

Blood pressure values were divided into three groups: normal, <140 and <90 mmHg for systolic and diastolic blood pressure respectively; borderline, systolic BP 140-159 and/or diastolic BP 90-94 mmHg, and hypertension, systolic BP of more than 160 and/or diastolic BP of more than 95 mmHg.

Results show that about 67 % (see fig 3) had normal systolic blood pressure and table 13 below shows that there was no significant difference in the mean systolic BP across the two sex categories (p value > 0.05) .

Diastolic blood pressure was normal in about 71% of the patients (see fig 4), table 13 below also show that there is no significant difference across sexes (p value > 0.05)

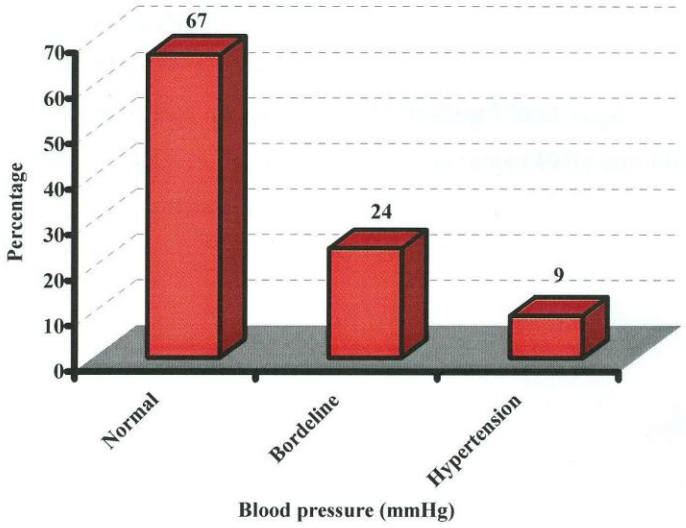


Fig 3: Systolic blood pressure among patients

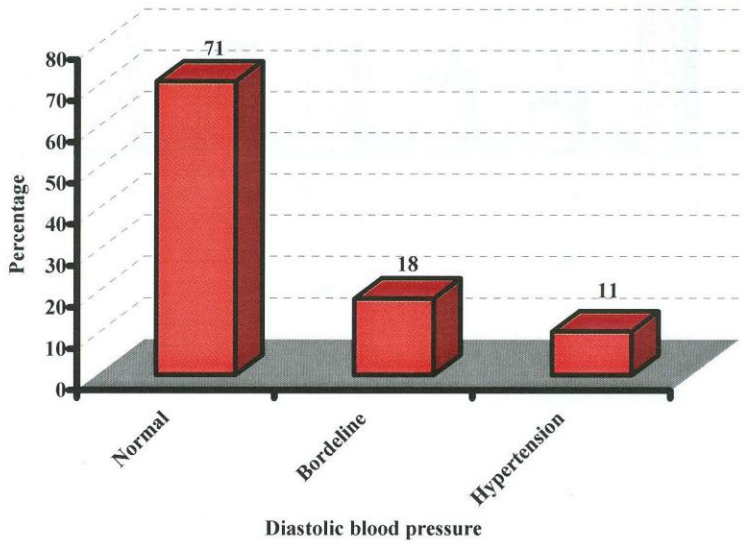


Figure 4: Diastolic blood pressure among patients

4.7.2 GLYCAEMIC CONTROL

FASTING BLOOD SUGAR LEVELS

Results shows that proportion of patients with fasting blood sugar levels of less than 7mmols/l were only about 26%. About half of the patients (49%) had blood sugar levels of more than 10mmols/ l as shown in figure 5 below.

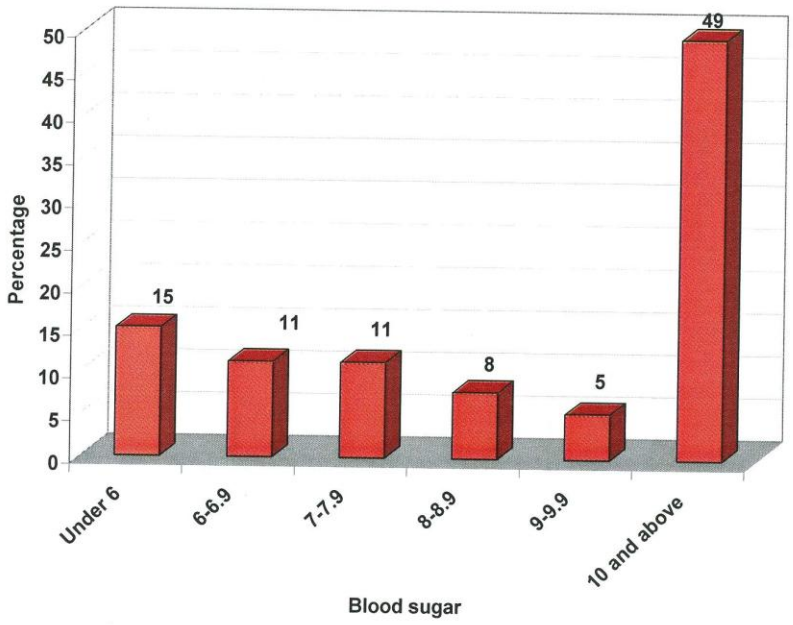


Fig 5: Fasting blood sugar levels

HBA1c LEVELS

HBA1c is an indicator of the mean daily blood glucose concentration over the preceding two to three months there fore a better measure of glucose control. Results show that the proportion of patients who had attained the recommended HBA1c levels of less than seven was about 19% as shown in fig 6 below. And there was a significant difference (p value < 0.05) across sexes as shown in table 13 below.

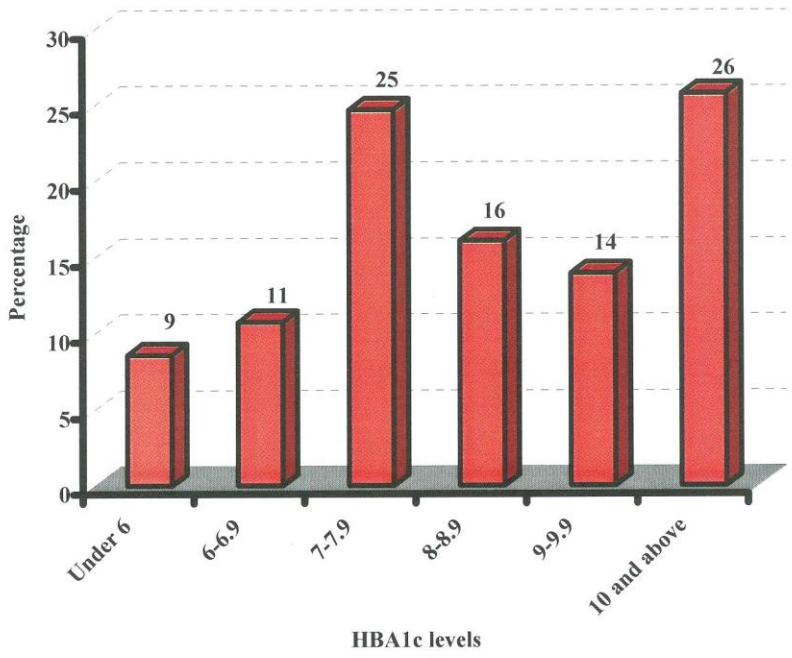


Figure 6: HBA1c levels among patients

4.7.3 BODY MASS INDEX

(BMI) Body mass index was defined as weight (kg) divided by the square of height (m). Subjects with a body mass index below 20 kg/m2 were regarded as underweight, those with an index 20-24.9 kg/m2 as normal weight, those with an index 25-30 kg/m2 as overweight, and those with an index over 30 kg/m2 as obese. Overall 18.5% of patients had a body mass index of more than 30 kg/m2. Females were more obese compared to males (p value < 0.0001), see fig 7 and table 13.

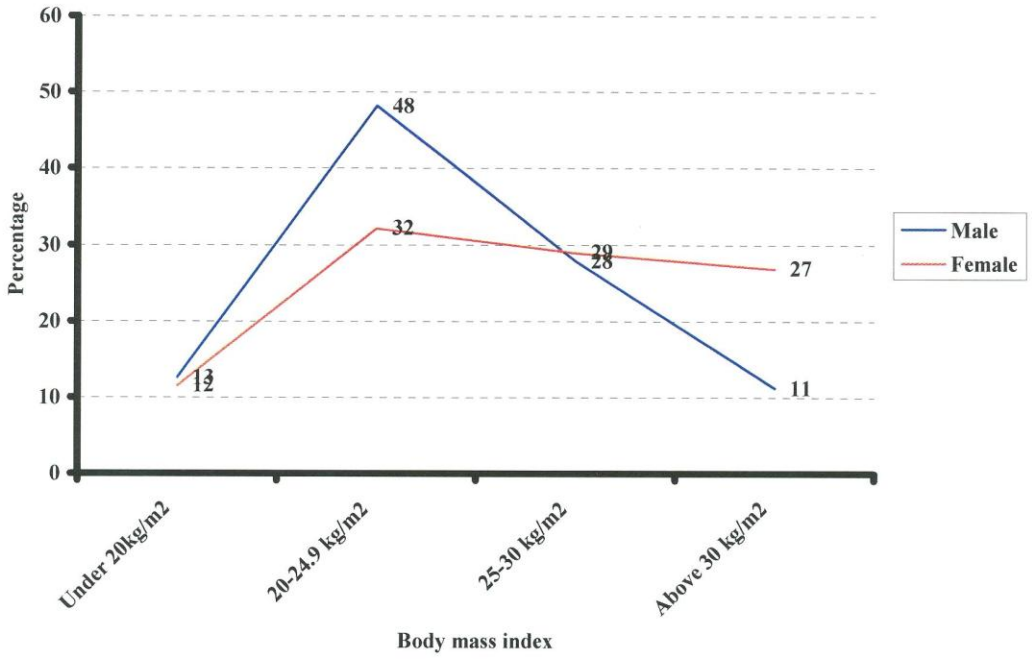


Figure 7: Patient Body Mass Index

Table 13: Patients outcome of diabetes care across sex categories

	Male	Female	Overall	
	n (%)	n (%)	n (%)	p-value
FBG (mmol/l)				
Under 6	42 (18.9)	30 (15.9)	72(17.5)	0.678
6-6.9	26 (11.7)	19 (10.0)	45 (11.0)	
7-7.9	26 (11.7)	21 (11.1)	47 (11.4)	
8-8.9	16 (7.2)	16 (8.5)	32 (7.8)	
9-9.9	15 (6.8)	8 (4.2)	23 (5.6)	
10 and Above	97 (43.7)	95 (50.3)	192 (46.7)	
BMI				
Under 20kg/m^2	28(12.6)	22(11.6)	50(12.2)	**<0.0000***
20-24.99 kg/m^2	108(48.7)	60(31.8)	168 (40.9)	
25-30 kg/m^2	61(27.5)	56(29.6)	117(28.5)	
Above 30 kg/m^2	25(11.3)	51(27)	76 (18.5)	
Systolic BP (mmHg)				
Normal	140 (64.2)	131(69.3)	271(66.6)	0.388
Borderline	54 (24.8)	44(23.3)	98(24.1)	
Hypertension	24 (11.0)	14 (7.4)	38 (9.3)	
HbA1c (%)				
Under 6	1(2.0)	7(16.7)	8 (8.6)	**<0.029***
6-6.9	5(9.8)	5(11.9)	10 (10.8)	
7-7.9	13(25.5)	10(23.8)	23 (24.7)	
8-8.9	6 (11.8)	9(21.4)	15 (16.1)	
9-9.9	11 (21.6)	2(4.8)	13 (14.0)	
10 and above	15 (29.4)	9(21.4)	24 (25.8)	

* Significant at α level of 5%

n = Number of observation (frequency)

4.8 FACTORS AFFECTING PATIENTS' OUTCOME OF TREATMENT

The regression model shows that important factors influencing blood sugar control were smoking and obesity. BMI of more than 30kgs increases the likelihood of having higher blood glucose levels and HBA1c levels. The model also shows that having some education had a significant impact on the blood sugar control, those on insulin seem to have higher blood sugar levels although results were not significant. Those with insurance coverage seem to have better glucose control compared to those exempted and those who use out of pocket mode of payment although the results are mathematically not significant

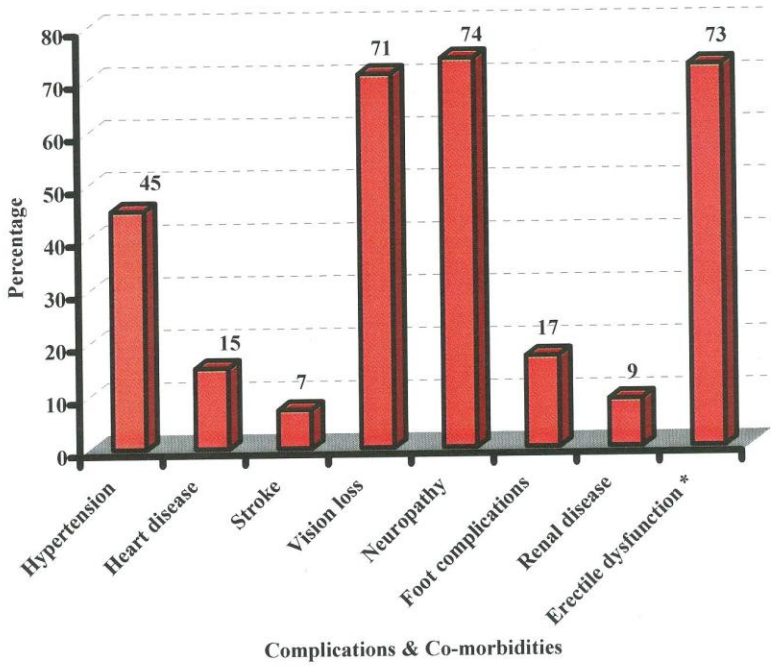
Table 14: linear regression models based on glycaemic control (HBA1c &FBG), Sex, Smoking, Education level, Insulin, Insurance, Body mass index, age.

	HbA1c value (r^2 =0.2374)		**FBG value (r^2= 0.0382)**	
	Coef	**Significance**	**Coef**	**Significance**
Sex	0.0544618	0.925	-0.8567865	0.143
Age	-0.036931	0.160	-0.115215	0.610
Smoking	0.678890	0.608	0.961635	0.274
Education				
(Some education)	0.859732	**<0.014***	-0.1113678	0.892
Insulin	0.0722494	0.904	0.8344555	0.200
Insurance	- 0.3721138	0.752	- 0.923425	0.268
BMI				
Under 20kg/m^2	-0.215943	0.589	-0.5903976	0.173
20-24.99 kg/m^2	-0.1855278	0.589	-1.510684	0.124
25-30 kg/m^2	-0.0988938	0.703	-0.4864551	0.826
Above 30 kg/m^2	0 163948	0.316	-0.0005783	0.857

* Significantly different

4.9 PREVALENCE OF COMPLICATIONS

Prevalence of reported complications among patients was high commonest being neuropathies which were reported by about 74% of patients, followed by loss of vision which was reported by about 72% of patients. Erectile dysfunctions were also common among men, with about 73% of them reporting having this problem as shown in fig 8 below. Other reported complications include high blood pressure, heart disease, stroke, renal disease and foot ulcers (see fig 8).



*Note: * In male patients*

Fig 8 prevalence of reported complications among patients attending diabetic clinics

4.10 CHALLENGES THAT PATIENTS FACE IN ACCESSING CARE

When asked about the challenges they face in accessing care many patients sighted transportation cost as their main obstacle, this was mentioned by more than 50% of the respondents. Others included cost of medication and lack of medication. See table 13 for the summary of other responses.

Table 15: Problems that patients face in accessing care (n= 411)

Problem	Number of patients	Percentage %
Clinics irregular/ inconvenient time	99	24.1
Can not afford transportation cost	252	61.3
Can not afford cost of medication	197	47.9
Can not afford cost of investigations	88	21.4
Lack of medications	170	41.4
Few health care providers	198	48.2

CHAPTER FIVE

5.0 DISCUSSION

Diabetes and other chronic conditions once considered a rare phenomenon are becoming more prevalent in African countries including Tanzania (Unwin et al, 2001). These diseases are now contributing significantly to morbidity and mortality in the country.

There is sufficient evidence from previous studies that improved metabolic and blood presssure control reduces the morbidity and mortality due to diabetes (UK Prospective diabetes Study Group, 1998 & 1999), therefore importance of quality of care provided is eminent in the management of diabetes and its associated conditions.

This report summarizes findings of a study carried out to assess quality of diabetes care provided to patients in Mwanza Region bearing in mind the inter link between structure, process and outcome components of health care intervention. On the basis of the recommendations for diabetes care, this study highlights a number of challenges and achievements made so far in providing appropriate care to patients with diabetes.

Findings from the study show that although the clinics had some basic capacity for patient diagnosis and follow up, many lacked the necessary capacity for screening of complications. With respect to process quality for provision of diabetic care; it is recommended that diabetic patients are screened for complications and other associated conditions once a year e.g. for eye, kidney, foot complications, cardiovascular, obesity, erectile dysfunctions and are referred to a higher level health facility if any complications are detected for expert care.

The capacity to perform lipid profile and renal function measurements were limited with only a third of all the health facilities being able to perform the tests. Among these most were the private and the higher level public health care facilities and in the region only one health facility which is the referral hospital has a machine for measuring Glycosylated hemoglobin levels. Therefore a patient would have to incur an extra cost if some of these tests were to be performed.

This and other factors like provider non adherence to diabetes management protocols could explain the lower proportion of patients screened (table 9) for eye, kidney, foot and cardiovascular complications compared to findings from other similar studies (Alberti et al 2007, DEDICOM survey 2006).

The proportion of patients screened for high blood pressure and obesity was just above average despite the fact that the availability of equipments blood pressure and BMI measurements wasn't so bad, again raising the question of availability versus adherence to standards of care.

For a diabetic clinic to function properly, the equipments listed in table 4 were proposed as the minimum equipments needed for establishing and running a diabetic clinic. Each of the health facility visited was supported by Tanzania Diabetes Association and was provided with a starter pack that contained most of the equipments in 2005. But results show that, in addition to the low capacity of the health facilities to monitor and screen patients for complications, facilities also lacked necessary equipments for management of acute complications and treatment guidelines. Many facilities lacked emergency treatment trays. Clinical practice guidelines were found in 2 out of 3 clinics visited mostly kept in storage. The available treatment guidelines were voluminous therefore not user friendly, this could be one of the reasons why they were not being used.

Another challenge in provision of diabetes care in our health care settings is most of the patients do not have equipments for measuring blood glucose at home; similarly this has been noted in the study by Majaliwa et al 2007 and this posse a great challenge especially in management of diabetic patients who are being treated with insulin.

Patients therefore depend entirely on the health facilities for their blood glucose monitoring.It has been noted in the study that most patients are seen on a regular basis with more than 85% attending the clinic by monthly appointments. Blood sugar measurements are done at every visit unless the reagent strips are unavailable, and this has been noted by the health workers attending patients as one of the motivating factor for patients to attend clinics.

With respect to the health personnel attending to patients, there is need for comprehensive training of the few available staff training to cover for the defunct referral system as the study findings show none of the clinics had a dietician, diabetic educators or chiropodist, therefore diet counseling, diabetic education and foot examinations are performed mainly by nurses and also the attending clinicians.

Despite the lack of specialists at the high levels of care, the minimum cadres required for the low levels of care were available although the numbers were in adequate. Findings from the study revealed that the mean number of clinicians attending to patients per facility was 1.4 and the mean number of those who had been trained was 1.14, showing that at least majority of them have received training on diabetic care. The mean number of nurses providing care and those who had been trained was 1.4 and 1.3 respectively although their distribution varied across different health facilities.

Health education has been reported to be provided in the clinics surveyed however, health education given on foot care and on complications of diabetes has been inadequate. Results show that only about 61% and 69% patients reported having received adequate information on foot care and on diabetes complications from their health care providers respectively. Coverage noted to be higher for advice on diet, treatment and exercise with about 88 %, 86%, 80% patients reporting having received adequate information respectively.

Although the coverage of providing health education to patients was higher than what has been reported in other studies (DEDICOM survey 2006), its effectiveness in empowering patients to manage their condition and improve their treatment outcome is beyond the scope of this study. However other studies have shown that access to effective diabetes education improves patients' care outcome and therefore reduced health care cost (Keers J et al, 2005) where diabetes education here means that the health care worker provides health education to patients regarding, diet, and information about their condition, possible complications and desired treatment goals, that will empower

them to render self care in the management of their diabetes and its associated conditions.

Lack of continuous supply of medications has also been noted and this has an implication on the overall outcome of care. Many patients access care from the public health care facilities where the drugs are provided for free after paying a blanket user fee that has been set by each facility regardless of the cost of the drug, and when the drugs are unavailable the cost of the medication is unbearable to most of the patients, therefore patients miss their daily doses until the drugs are made available.

Results from this study showed that the commonly used oral hypoglycaemics Glibenclamide and Metformin were available in only 60% and 73% of the health facilities respectively. However the availability of the commonly used antihypertensives e.g. Lasix, Aprinox, Propanolol, Nifedipine and Atenolol was not bad as these drugs were available in more than 80% of the clinics (Table 8). The patients also reported that drugs were not available as consistently as they sighted lack of drugs especially in public health care facilities as one of their problem in accessing care. Similarly drug availability was also reported in other studies as constraint in the provision of care and affected patients' treatment outcomes (Majaliwa et al, 2007).

The rapid increase on the number of diabetic patients noted in this study is more likely to increase strain on the available resources and consequently leading to deterioration of the quality of care. It is unclear that the increase is due to the actual increase in the incidence of diabetes in the general population, or to the increase in the availability of the health care services for diabetes following TDA intervention to improve service delivery in 2005. Results from the study show that there has been a steady increase in the number of patients with about 50% of the patients reporting having been diagnosed within the last three years.

The mean duration of illness since diagnosis in this study was lower compared to what has been reported in other studies which on average was 10 years (Alberti H et al, 2007, DEDICOM survey 2006).

The same applies to measurements HBA1c which is an indicator of the mean daily blood glucose concentration over the preceding two to three months there fore a better measure of glucose control. Results show that the proportion of patients who had attained the recommended HBA1c levels of less than seven was less than 20% as shown in fig 6. And there was a significant difference (p value < 0.05) across sexes as shown in table 13.Poor glycemic control in this study is also evidenced by the high level of reported complications among patients (Figure 8). Overall results shows that proportion of patients with poor glycaemic control was higher compared to findings from other studies where good glycaemic control was reported in about 40% of cases (Harzallah et al, 2004, Kolawole et al, 2005)

The study also attempted to look at some of the factors that influence outcome of treatment and the regression model showed that important factors influencing blood sugar control were smoking and obesity. BMI of more than 30kgs increases the likelihood of having higher blood glucose levels and HBA1c level which is consistent with what is known in the literature (Harzallah et al, 2004, Kolawole et al ,2005)

The model also shows that having some education had a significant impact on the blood sugar control, those on insulin seem to have higher blood sugar levels although results were not significant. Those with insurance coverage seem to have better glucose control compared to those exempted and those who use out of pocket payment although the results are mathematically not significant (Table14).

Patients were generally satisfied with the services provided, which has an implication on patients' adherence to clinic attendance and treatment in general.

The study findings revealed that the overall rating lies between very satisfied and somewhat satisfied. With patients being more satisfied with the amount of information provided about their condition and less satisfaction with availability of medication.

The short comings of this study are that it was a cross sectional study that only gives a point prevalence of the outcome of treatment, and does not give a full picture of the trend in quality improvement.

The complications reported in the study are perceived complications by the patients and not confirmed by investigations and therefore may not give a true picture of the prevalence of complications.

The strength of the study is that it has assessed quality in various aspects and more than one tool was used in the assessment therefore providing a comprehensive picture of the quality of care provided. HBA1c measurement also adds value to the assessment of glycaemic control since it provides an indication of blood glucose control 2 to 3 months prior to the assessment.

CHAPTER SEVEN

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7.2 APPENDICES

APPENDIX 1: HEALTH FACILITY QUESTIONNAIRE (STRUCTURE)

(Administered to in charge of health facility or of diabetic clinic at the facility)

General Information

1. Name of the health facility _____
2. Level of health facility
   1. Dispensary [ ]
   2. Health centre [ ]
   3. Hospital [ ]
3. Ownership 1.Public [ ] 2.Private [ ] 3. Faith based
4. Number of clinicians attending to patients with diabetes _____
5. Number of nurses attending to patients with diabetes _____
6. Average number of patients attended per clinic day _____
7. Total number of patients with diabetes enrolled in the clinic by Dec 2007 _____

Training

(*Note: If they have many trainings state latest year trained*)

8. (a) clinicians providing care for people with diabetes have been provided with any form of training related to diabetes care? _____

   (b) If when? (Please state the year) _____

9. (a) How many nurses providing care for people with diabetes have been provided with any form of training related to diabetes care? _____

   (b) If any state when? (Please state the year) _____

10. Are there regular continuing medical education activities provided to health workers caring for people with diabetes? 1 Yes[ ] 2 No [ ]

Equipments and supplies

11. Does the facility have the following equipments? (***Ask, observe and tick where appropriate***)

No.	Equipments	Available		Not Available	Remarks
		Functional	Not Functional		
1.	Clinic room(s)				
2.	Near by toilet				
3.	Doctors table				
4.	Nurses table				
5.	Examination couch with sheets				
6.	Storage cupboard/ cabinet				
7.	Clinical practice guidelines				
8.	Fridge for storing insulin				
9.	Tape measure				
10.	Weight scale				
11.	Height measure				
12.	Sphygmomanometer				
13.	Stethoscope				
14.	Monofilament(tuning fork)				
15	Emergency treatment tray				
16.	Patient registers				
17.	Glucometer				
18	Ophthalmoscope				
19	BMI calculator				
20	Snellens Chart				

12. Does the facility have a constant supply of the following? (***Tick where appropriate***)

No.	Equipments/supplies	Available in constant supply	
		Yes	No
1.	Appropriate glucose strips		
2.	Urine test strips		
3.	Oral hypoglycaemics		
4.	Insulin		
5.	Antihypertensives		
6.	Syringes		

Referral Services

(Note: Tick one appropriate response)

15. Where are the clinic's patients sent for eye examinations? _____

1 .No specific place [ ]

2 .Referred to eye clinic outside [ ]

3 .Eye clinic located in within the health facility [ ]

16. (a) Do you have access to a nutritionist? 1. Yes [ ] 2. No [ ]

(b) Where do patients get nutritional advice?

1. No specific place [ ]

2. Referred for nutritional advise outside [ ]

3. Nutritional advise provided at the clinic or within the health facility [ ]

17. Where do patients usually get their feet examined?

1. No specific place [ ]

2. Referred for feet examination outside [ ]

3. Feet examination is done at the clinic or within the health facility [ ]

18. Where do patients usually get diabetes education?

1. No specific place [ ]

2 .Referred to a diabetes educator outside [ ]

3 .A diabetes educator is located at the clinic or within the health facility [ ]

19. Is there a laboratory available at the health facility?

1. No, referred to specific laboratory outside [ ]

(***Go to question 27***)

2. Yes, laboratory is located within the health facility [ ]

(***Must answer question 20-26***)

Laboratory Services

*IF yes to question 18, is the laboratory at the health facility equipped to carry out the following tests? (**Ask, observe and tick where appropriate***

20. Venous blood glucose 1. Yes [ ] 2 .No [ ]
21. Capillary blood glucose (using glucometer) 1. Yes [ ] 2 .No [ ]
22. Glycosylated hemoglobin (HbA1c) 1. Yes [ ] 2. No [ ]
23. Lipid profile 1. Yes[ ] 2 .No [ ]
24. Serum creatinine 1. Yes [ ] 2. No [ ]
25. Urine testing 1 .Yes [ ] 2. No [ ]
26. Does the clinic have equipment to do Electrocardiograms? (***applicable to secondary and tertiary health facilities only***) 1. Yes [ ] 2. No [ ]

Miscellaneous

27. Are 'Management Guidelines' for patients with diabetes available to the health care workers?

1. Yes [ ] 2 .No [ ]

If 'Yes' mention the name of the Guidelines _____

28. Please mention the challenges you face as health service providers in providing care for people with diabetes

1).....

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.....

.....

2).....

.....

.....

APPENDIX 2: HEALTH FACILITY QUESTIONNAIRE, SWAHILI VERSION

Namba ya Dodoso ___ ___ ___

Tarehe ya mahojiano siku _____ ***Mwezi*** _____ ***Mwaka*** _____

Taarfa za ujumla

1. Jina la hospitali _____

2. Aina ya hospitali

    1. Zahanati [ ]
    2. Kituo cha afya [ ]
    3. Hospitali [ ]

3. Umiliki wa hospitali 1. Serikali [ ] 2. Binafsi [ ] Shirika la dini [ ]

4. Idadi ya madaktari wanaohudumia wagonjwa wa kisukari kwenye kliniki _____

5. Idadi ya manesi wanaohudumia wagonjwa wa kisukari kwenye kliniki _____

6. Wastani wa idadi ya wagonjwa wanaohudhuria kwa kila siku ya kliniki

_____

7. Idadi ya wagonjwa wote waliosajiliwa kwenye kliniki mpaka kufikia Desemba 2007

_____

Mafunzo

(*N:B: Kama wamepata mafunzo zaidi ya mara moja taja mwaka waliopewa mafunzo ya mwisho*)

8. (a)Ni madaktari wangapi wanaohudumia wagonjwa wa kisukari kwenye kliniki wamepata mafunzo yahusuyo jinsi ya kumhudumia mgonjwa wa kisukari? _____

(b) Taja mwaka waliopata mafunzo hayo _____

9. (a)Ni manesi wangapi wanaohudumia wagonjwa wa kisukari kwenye kliniki wamepata mafunzo yahusuyo jinsi ya kumhudumia mgonjwa wa kisukari? _____

(b) Taja mwaka waliopata mafunzo hayo _____

10. Je kuna mafunzo yeyote endelevu wanayopata wafanyakazi wa afya wanaohudumia wagonjwa wa kisukari? 1 Ndiyo[ ] 2 Hapana [ ]

Vitendea kazi

11. Je kliniki ina vitendea kazi vifuatavyo? (***Uliza , angalia kisha tiki panapostahili***)

No	Vitendea Kazi	Kipo		Hakipo	Maelezo
		Kinatumika	Kibovu		
1.	Chumba cha clinic				
2.	Choo cha wagonjwa				
3.	Meza ya daktari				
4.	Meza ya manesi				
5.	Kitanda cha kuonea wagonjwa na shuka				
6.	Kabati la kuhifadhia vifaa				
7.	Mwongozo wa kutibu wagonjwa				
8.	Friji ya kuhifadhia Insulin				
9.	Tepu (tapemeasure)				
10.	Mzani wa kupimia uzito				
11.	Tepu ya kupimia urefu				
12.	Mashine ya kupimia BP				
13.	Stethoscope				
14.	Kifaa cha kupimia hisia (tuning fork)				
15	Trei ya dharura (emergency tray)				
16.	Rejista ya wagonwa				
17.	Machine ya kupimia sukari (Glucometer)				
18	Kifaa cha kupimia macho (Ophthalmoscope)				
19	Calculeta ya BMI (BMI calculator)				
20	Chati ya kupimia macho (Snellens Chart)				
21	Vifaa vya kufundishia wagonjwa				

12. Je hospitali/ kliniki inapata vifaa vifuatavyo wakati wote? (***Tiki panapostahili***)

No.	Kifaa	Kinapatikana kwa uhakika	
		Ndio	Hapana
1.	Stripu za kupimia sukari (Glucostrips)		
2.	Stripu za kupimia mkojo		
3.	Dawa za vidonge za kisukari		
4.	Insulini		
5.	Dawa za kupunguza presha (Antihypertensives)		
6.	Mabomba ya sindano		

13. Je kwa kawaida hospitali/ kliniki ina dawa zifuatazo? (***Uliza mtu wa pharmacy au mgawaji dawa***)

No.	Jina la dawa	Zinapatikana kwa uhakika	
		Ndio	Hapana
1.	Glibenclamide		
2.	Chlorpropamide		
3.	Glipizide		
4.	Tolbutamide		
5.	Metformin		
6.	Rosglitazone		
7.	Lasix		
8.	Aprinox		
9.	Aldomet		
10.	Propanolol		
11.	Nifedipine		
12.	Captopril		
13.	Enalapril		
14.	Losartan		
15.	Atenolol		

14. Je wagonjwa wanaohudumiwa na kliniki wanapata huduma zifuatazo na kwa gharama gani? (***Tiki panapostahili na jaza kiasi panapostahili***)

No.	Huduma	Bure	Wanalipia gharama yote	Wanachangia kiasi	Gharama(Tshs)
1.	Vidonge vya kisukari				
2.	Insulini				
3.	Mabomba ya sindano				
4.	Kupima sukari kwenye damu				
5.	Kupima mkojo				

Huduma za Rufaa

(N:B: Tiki jibu moja)

15. Je wagonjwa wenu huwa wanapima wapi macho? _____

1 .Hakuna sehemu maalum [ ]

2 .Wanapewa rufaa kwenda kwenye kliniki ya macho nje ya hospitali [ ]

3. Wanapewa rufaa kwenda kwenye kliniki ya macho ndani ya hospitali [ ]

16. (a) Je mna mtaalamu wa chakula na lishe? 1. Ndiyo [ ] 2. Hapana [ ]

(b) Je wagonjwa wenu huwa wanapata wapi ushauri kuhusu lishe?

1. Hakuna sehemu maalum [ ]

2. Wanapewa rufaa kwenda kwa mtaalamu nje ya hospitali [ ]

3. Huduma za ushauri zinapatikana hapahapa cliniki/ hospitali [ ]

17. Je wagonjwa wenu wanapata wapi huduma za kuchunguzwa miguu kwa ajili ya 'diabetic foot'?

1. Hakuna sehemu maalum [ ]

2. Tunawapa rufaa kwenda kumuona mtaalamu nje ya hopitali [ ]

3. Wanapata huduma ya uchunguzi wa miguu hapa hapa hospitali [ ]

18. Je wagonjwa wenu wanapata wapi huduma za elimu juu ya ugonjwa wa kisukari?

    1. Hakuna sehemu maalum [ ]

    2. Tunawapa rufaa kwenda kumuona mtaalamu nje ya hopitali [ ]

    3 .Tuna mtaalamu wa kutoa elimu juu ya kisukari hapahapa kliniki/ hospitali [ ]

19. Je mna huduma za maabara kwenye hospitali?

    1. hapana, wagonjwa huwa wanapewa rufaa kwenda kwenye maabara za nje [ ]

    (***Nenda swali namba 26***)

    2. Ndiyo, tuna maabara [ ]

    (***Jibu swali 20-25***)

Huduma za maabara

Kama jibu la swali la 18 ni ndiyo, je maabara ina uwezo wa kufanya vipimo vifuatavyo? ***(Uliza mtu wa maabara ikiwezekana)***

20. Sukari kwenye damu kwa vipimo vya maabara ?

1. Ndiyo [ ] 2 .Hapana [ ]

21. Sukari kwenye damu kwa kutumia glucometer ?

1. Ndiyo [ ] 2 .Hapana [ ]

22. Sukari kwenye chembe nyekundu za damu (HbA1c)?

1. Ndiyo [ ] 2. Hapana [ ]

23. Kupima Lipid profile ?

1. Ndiyo[ ] 2 .Hapana [ ]

24. Kupima Serum creatinine ?

1. Ndiyo [ ] 2. Hapana [ ]

25. Kupima mkojo ?

1 .Ndiyo [ ] 2. Hapana [ ]

26. Je kliniki/ hospitali ina vifaa vya kufanya Electrocardiograms (ECG)?

1. Ndiyo [ ] 2. Hapana [ ]

Mengineyo

27. Je wafanyakazi wa afya wanapatiwa miongozo ya kutoa huduma kwa wagonjwa wa kisukari?

1. Ndiyo [ ] 2 .hapana [ ]

Kama ndiyo, toa mfano wa mwongozo mlio nao _____

_____

28. Tafadhali nitajie matatizo mnayokumbana nayo katika kutoa huduma kwa wagonjwa wa kisukari

1).....

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2).....

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APPENDIX 3: PATIENT QUESTIONNAIRE (PROCESS AND OUTCOME)

Introduction

I am / we are _____, and we are conducting a study to assess the quality of care and treatment you are receiving from the diabetic clinic. I/We will ask you about 33 questions regarding the services you are receiving here as well as taking some physical measurements. Would you mind participating?

***If the informant agrees, administer informed consent and ensure confidentiality**:*

Everything we discuss will be treated confidentially (no one else will know who said what). But you should feel free to remain silent if you hesitate to answer a particular question. And if you have any questions for us, please feel free to ask them.

Questionnaire number ____ ____ ____

Date of interview Day_____ Month _____ Year _____

General Information

1. Name of the health facility _____
2. Level of health facility
    1. Dispensary [ ]
    2. Health centre [ ]
    3. Hospital [ ]
3. Age: _____
4. Sex: 1. Male [ ] 2. Female [ ]
5. Occupation/ Source of income (***Tick one appropriate response***)
    1. No source of income [ ] 8. Other [ ] Specify _____
    2. Irregular income from petty trade / farming on borrowed land [ ]
    3. Unskilled labourer [ ]
    4. Farmer (own land) [ ]
    5. Trader (Kiosk/ Coffee shop) [ ]
    6. Teacher/ Nurse/ Civil servant [ ]
    7. Doctor/ lawyer/ Engineer/ Government administrator [ ]

6. Highest educational level attained

1. Primary school [ ]
2. Secondary school [ ]
3. Occupational training eg VETA [ ]
4. University level [ ]
5. Other [ ] specify _____

7. Marital status

1. Married [ ]
2. Single [ ]
3. Divorced [ ]
4. Widowed [ ]

8. Reason for latest consultation

1 Follow-up [ ]
2 Newly diagnosed [ ]
3 Acute emergency [ ]
4 For blood pressure control [ ]
5 Complication [ ]
6 Other [ ]

Care Provided

9. When were you diagnosed with diabetes? _____ Month _____ Year

10. Since when have you been attending this clinic? _____ Month_____ Year

11. Have you ever attended any other clinic before coming here? 1. Yes [ ] 2. No [ ]

11. How often do you attend the clinic in a year? _____

12. What's the date of latest visit (dd/mm/yy) __/__/__

13. (a) Have you ever been asked about your family history of diabetes? (***tick the appropriate answer***)

1. Yes [ ] 2. No [ ] 3. Don't know [ ]

(b) Are there other cases of diabetes in your family? (***Enquire about immediate family i.e. first degree relatives e.g. mother, father, brother, sister, children***)

1. Yes[ ]
2. No[ ]
3. Don't know [ ]

14. (a) Have you ever been asked about your smoking habit?

1. Yes[ ]
2. No[ ]
3. Don't know [ ]

(b) Do you smoke?

1. Yes [ ]
2. No [ ]

15.(a)Have you ever been asked whether you take alcohol?

1. Yes [ ]
2. No[ ]
3. Don't know [ ]

(b) Do you take alcohol?

1. Yes [ ]
2. No[ ]

16. Have any of these procedures been done in the past one year?

1. Dilated eye examination? 1. Yes [ ] 2 .No [ ] 3. Don't know [ ]
2. Blood pressure measurements1. Yes [ ] 2 .No [ ] 3. Don't know [ ]
3. Height measurement1. Yes [ ] 2 .No [ ] 3. Don't know [ ]
4. Body weight measurement? 1. Yes [ ] 2 .No [ ] 3. Don't know [ ]
5. Urinalysis? (*urine examination*) 1. Yes [ ] 2 .No [ ] 3. Don't know [ ]

6. ECG? (***for secondary health care facility***) 1. Yes [ ] 2 .No [ ]
   3. Don't know [ ]
7. Was serum creatinine measured (*blood for kidney functions*)? 1. Yes [ ]
   2. No [ ] 3. Don't know [ ]
8. Was serum lipid profile measured? (*blood for cholesterol*) 1. Yes [ ]
   2. No [ ] 3. Don't know [ ]

Treatment

17. (a)Are you on any medication for diabetes? 1. Yes [ ] (***Go to 17 (b & c)***)
    2. No [ ] (***Go to 17(d)***)

    (b) If yes, what type of pharmacological treatment have you been prescribed?
    1. Oral hypoglycaemics [ ]
    2. Insulin[ ]
    3. Others [ ] (Specify _____

    (c) In addition to drugs have you been advised on lifestyle modification?
    1. Yes [ ] 2 .No [ ]

    (d)If no, which of the following non-pharmacological treatments have you been prescribed?
    1. Dietary advise [ ]
    2. Weight reduction [ ]
    3. Physical exercise [ ]
    4. All of the above [ ]

18. (a)Do you monitor your glucose at home?
    1. Yes [ ] 2. No [ ]
    (b) If yes, using what method? 1. Glucometer [ ] 2. Uristics [ ]
    3. Both [ ]

19. Which of the following have been prescribed or provided in the past 12 months?
    1. Foot exam 1. Yes [ ] 2. No [ ] 3. Don't know
    2. Nutritional Advice 1. Yes [ ] 2. No [ ] 3. Don't know
    3. Diabetes education 1. Yes [ ] 2. No [ ] 3. Don't know
    4. Exercise counseling 1. Yes [ ] 2. No [ ] 3. Don't know
    5. Dilated eye exam 1. Yes [ ] 2. No [ ] 3. Don't know
    6. Dental exam 1. Yes [ ] 2. No [ ] 3. Don't know

20. As part of diabetes education have you been well informed on the following?
    1. Diagnosis 1. Yes [ ] 2. No [ ] 3. Don't know
    2. Diet 1. Yes [ ] 2. No [ ] 3. Don't know
    3. Exercise 1. Yes [ ] 2. No [ ] 3. Don't know
    4. Smoking 1. Yes [ ] 2. No [ ] 3. Don't know
    5. Alcohol 1. Yes [ ] 2. No [ ] 3. Don't know
    6. Complications of diabetes 1. Yes [ ] 2. No [ ] 3. Don't know
    7. Treatment of diabetes 1. Yes [ ] 2. No [ ] 3. Don't know
    8. Foot care 1. Yes [ ] 2. No [ ] 3. Don't know

Complications & Co-morbidities

21. Have you been diagnosed with any of the following?
    1. Hypertension 1. Yes [ ] 2 .No [ ] 3. Don't know [ ]
    2. Heart disease 1.Yes [ ] 2 .No [ ] 3. Don't know [ ]
    3. Stroke 1.Yes [ ] 2 .No [ ] 3. Don't know [ ]
    4. Vision loss 1.Yes [ ] 2 .No [ ] 3. Don't know [ ]
    5. Neuropathy/ abnormal sensations 1. Yes [ ] 2 .No [ ] 3. Don't know [ ]
    6. Foot complications 1.Yes [ ] 2 .No [ ] 3. Don't know [ ]
    7. Nephropathy/ Renal disease 1.Yes [ ] 2 .No [ ] 3. Don't know [ ]
    8. Erectile dysfunction 1.Yes [ ] 2 .No [ ] 3. Don't know [ ] N/A. [ ]

Patients direct costs associated with the services

22. Do you have to pay for services? 1. Yes [ ] 2. No [ ]

23. Payment system (How do you pay?)

1. User fee (out of pocket) [ ]
2. Insurance [ ]
3. Other [ ] (Specify _____)
4. Not applicable_____

24. What is the average cost do you incur on the following per clinic visit?

No.	Service description	Average cost of service in Tshs
1.	Transportation	
2.	Registration	
3.	Consultation	
4.	**Laboratory**	
	- Blood glucose	
	-Cholesterol	
	- Urine tests	
5.	BP measurement	
6.	Height measurement	
7.	Weight measurement	
8.	**Drugs and supplies**	
	-Oral hypoglycaemics	
	- Insulin	
	- Syringes	

Patient Satisfaction with Services

How do you rate your satisfaction with any of the following services? (***Tick the appropriate answer***)

25. Reception

1. Very satisfied [ ]
2. Somewhat satisfied [ ]
3. Somewhat dissatisfied [ ]
4. Very dissatisfied [ ]

26. Amount of time spent to be seen

1. Very satisfied [ ]
2. Somewhat satisfied [ ]
3. Somewhat dissatisfied [ ]
4. Very dissatisfied [ ]

27. Amount of time spent in consultation with the attending clinician

1. Very satisfied [ ]
2. Somewhat satisfied [ ]
3. Somewhat dissatisfied [ ]
4. Very dissatisfied [ ]

28. Relationship with health care providers

1. Very satisfied [ ]
2. Somewhat satisfied [ ]
3. Somewhat dissatisfied [ ]
4. Very dissatisfied [ ]

29. Amount of information provided about your condition

1. Very satisfied [ ]
2. Somewhat satisfied [ ]
3. Somewhat dissatisfied [ ]
4. Very dissatisfied [ ]

30. Laboratory services

1. Very satisfied [ ]
2. Somewhat satisfied [ ]
3. Somewhat dissatisfied [ ]
4. Very dissatisfied [ ]

31. Availability of drugs

1. Very satisfied [ ]
2. Somewhat satisfied [ ]
3. Somewhat dissatisfied [ ]
4. Very dissatisfied [ ]

32. Overall quality of care provided

1. Very satisfied [ ]
2. Somewhat satisfied [ ]
3. Somewhat dissatisfied [ ]
4. Very dissatisfied [ ]

Others

33. What the main problems/ challenges you face with regard to getting health care services for diabetes (***Tick appropriate response(s)***)

1. Long traveling distance to clinics from residence [ ]
2. Clinics are not regular/ inconvenient timing of the clinics [ ]
3. Cannot afford transport [ ]
4. Cannot afford medications [ ]
5. Cannot afford investigations [ ]
6. Lack of medications [ ]
7. Lack of laboratory services [ ]
8. Few health care providers [ ]

Physical parameters

1. Capillary blood sugar _____mmol/l
2. Blood pressure

   Systolic _____ mmHg

   Diastolic _____ mmHg
3. Glycosylated hemoglobin levels _____%
4. Height: _____ cm
5. Weight: _____ kgs

APPENDIX 4: PATIENT QUESTIONNAIRE, SWAHILI VERSION

Utangulizi

Jina langu/ majina yetu ni _____,Nina/ Tunafanya utafiti wa kuangalia ubora wa huduma zinazotolewa kwenye cliniki za kisukari hapa Mwanza .Nita/tutakuuliza maswali yapatayo 33 kuhusu huduma unazopata kwenye kliniki pamoja na kuchukua vipimo kama urefu, uzito presha n.k Je unakubali kushiriki?

***Kama mgonjwa amekubali kushiriki mpatie fomu ya ridhaa na muhakikishie usiri wa mazungumzo**:*

Kila kitu tutakachojadili itakuwa siri na hakuna mtu yeyote atakayejua juu ya mazungumzo haya). Uwe huru kukaa kimya kama kuna swali ambalo hutapenda kulijibu. Na kama una swali lolote jisikie huru kuuliza.

Namba ya dodoso ____ ____ ____

Tarehe ya usaili Siku _____ ***Mwezi*** _____ ***Mwaka*** _____

Taarifa za ujumla

1. Jina la hospitali _____
2. Aina ya hospitali
    1. Zahanati [ ]
    2. Kituo cha afya [ ]
    3. Hospitali [ ]
3. Umri: _____
4. Jinsia 1. Mme [ ] 2. Mke [ ]
5. Kazi / Jinsi ya kupata kipato(***Tiki jibu moja***)
    1. Sina kipato [ ]
    2. Sina kipato cha ukakika/ nalima kwenye mashamba ya watu [ ]
    3. Kibarua [ ]
    4. Mkulima (Nina ardhi) [ ]
    5. Biashara ndogo ndogo kama duka, kiosk [ ]
    6. Mwalimu/ Nesi / Mfanyakazi wa serikali [ ]

7. Daktari/ Mwanasheria/ Mhandisi/ Mfanyakazi ngazi ya juu serkalini [ ]
8. Kazi nyingineyo [ ] (elezea) _____

6. Je umefikia kiwango gani cha juu cha elimu?
   1. Elimu ya msingi [ ]
   2. Elimu ya sekondari [ ]
   3. Elimu ya ufundi kama VETA [ ]
   4. Elimu ya chuo kikuu [ ]
   5. Elimu nyingineyo [ ] elezea _____

7. Hali ya ndoa
   1. Nimeoa/ nimeolewa [ ]
   2. Sijaoa/ sijaolewa [ ]
   3. Nimeachana na mume/ mke [ ]
   4. Mjane [ ]

8. Sababu ya kuhudhuria kliniki mara ya mwisho
   1. Nilikuwa nimepangiwa kuja siku hiyo [ ]
   2. Nilikuja kuanza cliniki kwa mara ya kwanza [ ]
   3. Nilizidiwa na ugonjwa [ ]
   4. Kwa ajili ya kupata matibabu ya presha [ ]
   5. Kwa ajili ya kupata matibabu ya magonjwa yatokanayo na kisukari [ ]
   6. Mengineyo [ ]

Huduma zinazotolewa

9. Uligundulika lini kuwa una kisukari? _____ Mwezi _____ Mwaka
10. Umeanza lini kuhudhuria hii kliniki? _____ Mwezi_____ Mwaka
11. Umewahi kuhudhuria kliniki nyingine ya kisukari kabla ya kuja hapa?
    1. Ndio [ ] 2. Hapana [ ]
11. Kwa kawaida unahudhuria kliniki mara ngapi kwa mwaka? _____
12. Mara ya mwisho ulikuja lini? (Siku/mwezi/mwaka) ____/_____/_____

13. (a) Tangu umeanza kuhudhuria kliniki umewahi kuulizwa kuhusu wagonjwa wengine wa kisukari kwenye familia yako? (***Tiki panapostahili***)

1. Ndiyo [ ] 2. Hapana [ ] 3. Sijui [ ]

(b) Je kuna mtu mwenye kisukari katika familia yako ya karibu kama mama, baba, kaka, dada au watoto?

1. Ndiyo[ ]
2. Hapana[ ]
3. Sijui [ ]

14. (a) Tangu umeanza kuhudhuria kliniki umewahi kuulizwa kama unavuta sigara?

1. Ndiyo [ ]
2. Hapana [ ]
3. Siju [ ]

(b) Je unavuta sigara?

1. Ndiyo [ ]
2. Hapana [ ]

15.(a) Tangu umeanza kuhudhuria kliniki umewahi kuulizwa kama unakunywa pombe?

1. Ndiyo [ ]
2. Hapana [ ]
3. Sijui [ ]

(b) Je unakunywa pombe?

1. Ndiyo [ ]
2. Hapana [ ]
3. Sijui

16. Je umewahi kufanyiwa vipimo vifuatavyo ndani ya mwaka mmoja uliopita?

9. Kupimwa macho 1. Ndiyo [ ] 2 .Hapana [ ] 3. Sijui [ ]
10. Kupimwa presha 1. Ndiyo [ ] 2 .Hapana [ ] 3. Sijui [ ]
11. kupimwa urefu 1. Ndiyo [ ] 2 .Hapana [ ] 3. Sijui [ ]
12. Kupimwa uzito 1. ndiyo [ ] 2 .Hapana [ ] 3. Sijui [ ]
13. Kupimwa mkojo1. Ndiyo [ ] 2 .Hapana [ ] 3. Sijui [ ]
14. Kufanyiwa kipimo cha moyo (ECG) 1. Ndiyo [ ] 2. Hapana [ ] Sijui [ ]
15. Kufanyiwa kipimo cha figo (*serum creatinine*) ? 1. Ndiyo [ ]
    2. Hapana [ ] 3. Sijui [ ]
16. Kupima kiwango cha mafuta mwilini (*cholesterol*) 1. Ndiyo [ ]
    2. Hapana [ ] 3. Sijui [ ]

Matibabu

17. (a)Je unatumia dawa zozote za kisukari? 1. Ndiyo [ ] (***Nenda swali na. 17 (b & c)***)
    2. Hapana [ ] (***Nenda swali na.17(d)***)

(b) Kama ndiyo, ni aina gani ya dawa unatumia?

1.Vidonge [ ]
2.Insulini[ ]
3.Nyinginezo [ ] (elezea) _____

(c) Zaidi ya dawa je umewahi kupewa ushauri juu ya kubadilisha mwenendo wa maisha kupunguza athari za kisukari?

1. Ndiyo[ ] 2 .Hapana [ ]

(d)Kama hutumii dawa, umepatiwa tiba gani mbadala?

1. Ushauri kuhusu lishe [ ]
2. Kupunguza uzito [ ]
3. Kufanya mazoezi [ ]
4. Vyote vilivyotajwa hapo juu [ ]
5. Sijapata tiba yeyote mbadala [ ]

18. (a)Je huwa unajipima sukari nyumbani? 1. Ndiyo [ ] 2. Hapana [ ]

(b) Kama ndiyo huwa unatumia njia gani?

1. Natumia Glucometer [ ]
2. Napima sukari kwenye mkojo kwa kutumia Uristics [ ]
3. Natumia njia zote zilizotajwa hapo juu [ ]

19. Je ndani ya miezi kumi na mbili umewahi kupata au kuambiwa kufuata huduma zifuatazo?

1.Uchunguzi wa miguu 1. Ndiyo [ ] 2. Hapana [ ] 3. Sijui [ ]

2.Ushauri kuhusu lishe 1. Ndiyo [ ] 2. Hapana [ ] 3. Sijui [ ]

3.Elimu ya ugonjwa wa kisukari 1. Ndiyo[ ] 2. Hapana [ ] 3. Sijui [ ]

4. Ushauri kuhusu kufanya mazoezi 1. Ndiyo [ ] 2. Hapana [ ] 3. Sijui [ ]

5. Uchunguzi wa macho 1. Ndiyo [ ] 2. Hapana [ ] 3. Sijui [ ]

6.Uchunguzi wa meno 1. Ndiyo [ ] 2. Hapana [ ] 3. Sijui [ ]

20. Kuhusu elimu ya kisukari , je umepatiwa maelezo ya kutosha kuhusu yafauatayo?

1. Ugonjwa wako 1. Ndiyo [ ] 2.Hapana [ ] 3.Sijui [ ]
2. Lishe 1. Ndiyo [ ] 2.Hapana [ ] 3.Sijui
3. Umuhimu wa mazoezi 1.Ndiyo [ ] 2. Hapana [ ] 3.Sijui [ ]
4. Uvutaji sigara 1. Ndiyo [ ] 2.Hapana [ ] 3.Sijui [ ]
5. Unywaji pombe 1. Ndiyo [ ] 2.Hapana [ ] 3.Sijui [ ]
6. Athari za kisukari 1.Ndiyo [ ] 2.Hapana [ ] 3.Sijui [ ]
7. Matibabu ya kisukari 1.Ndiyo [ ] 2.Hapana [ ] 3.Sijui [ ]
8. Utunzaji wa miguu kwa mwenye kisukari 1.Ndiyo[ ] 2.Hapana [ ] 3.Sijui

Magonjwa mengineyo yaambatanayo au yatokanayo na kisukari

21. Je umewahi kuambiwa au una maradhi yafuatayo?

1.Presha 1. Ndiyo [ ] 2.Hapana [ ] 3.Sijui [ ]

2.ugonjwa wa moyo 1. Ndiyo [ ] 2.Hapana [ ] 3.Sijui [ ]

3.Kiharusi 1. Ndiyo [ ] 2.Hapana [ ] 3.Sijui [ ]

4.Kutokuona vizuri 1. Ndiyo [ ] 2.Hapana [ ] 3.Sijui [ ]

5.Kupata vichomi kwenye mikono na miguu (neuropathy) 1. Ndiyo [ ] 2.Hapana [ ] 3.Sijui [ ]

6.Kupata vidonda miguuni 1. Ndiyo [ ] 2.Hapana [ ] 3.Sijui [ ]

7.Ugonjwa wa figo 1. Ndiyo [ ] 2.Hapana [ ] 3.Sijui[ ]

8.Kukosa nguvu za kiume 1. Ndiyo [ ] 2.Hapana [ ] 3.Sijui 4.N/A. [ ]

Gharama za matibabu anazokabiliana nazo mgonjwa

22. Je huwa unalipia huduma? 1. Ndiyo [ ] 2. Hapana [ ]

23. Je, huwa unalipiaje?

1. Kutoka mfukoni [ ]
2. Kupitia bima ya afya [ ]
3. Njia nyingineyo [ ] (elezea) _____
4. N/A [ ]

24. Je huwa unaingia gharama kiasi gani kila unapohudhuria kliniki?

No.	Huduma	Gharama (Tshs)
1.	Usafiri	
2.	Kujisajili kliniki	
3.	Kumuona daktari	
4.	**Huduma za maabara**	
	- Kupima sukari	
	-Kupima cholesterol	
	- Kupima mkojo	
5.	Kupima presha	
6.	Kupima urefu	
7.	Kupima uzito	
8.	**Madawa**	
	-Vidonge vya kisukari	
	- Insulini	
	- Mabomba ya sindano	

Ubora wa huduma zitolewazo

Tafadhali tueleze maoni yako juu ya ubora wa huduma zitolewazo kwnye kliniki? (***Tiki jibu linalostahili***)

25. Mapokezi
    1. Naridhishwa sana [ ]
    2. Naridhishwa kidogo [ ]
    3. Siridhishwi kidogo [ ]
    4. Siridhishwi kabisa [ ]

26. Muda unaotumia kusubiri kuonwa na daktari au mtoa huduma
    1. Naridhishwa sana [ ]
    2. Naridhishwa kidogo [ ]
    3. Siridhishwi kidogo [ ]
    4. Siridhishwi kabisa [ ]

27. Muda unaotumia kuonwa na daktari
    1. Naridhishwa sana [ ]
    2. Naridhishwa kidogo [ ]
    3. Siridhishwi kidogo [ ]
    4. Siridhishwi kabisa [ ]

28. Uhusiano wako na watoa huduma
    1. Naridhishwa sana [ ]
    2. Naridhishwa kidogo [ ]
    3. Siridhishwi kidogo [ ]
    4. Siridhishwi kabisa [ ]

29. Maelezo unayoyapata kuhusu ugonjwa ulionao

1. Naridhishwa sana [ ]
2. Naridhishwa kidogo [ ]
3. Siridhishwi kidogo [ ]
4. Siridhishwi kabisa [ ]

30. Huduma za maabara

1. Naridhishwa sana [ ]
2. Naridhishwa kidogo [ ]
3. Siridhishwi kidogo [ ]
4. Siridhishwi kabisa [ ]

31. Upatikanaji wa dawa

1. Naridhishwa sana [ ]
2. Naridhishwa kidogo [ ]
3. Siridhishwi kidogo [ ]
4. Siridhishwi kabisa [ ]

32. Kwa ujumla unaonaje huduma zinazotolewa?

1. Naridhishwa sana [ ]
2. Naridhishwa kidogo [ ]
3. Siridhishwi kidogo [ ]
4. Siridhishwi kabisa [ ]

Mengineyo

33. Ni matatizo gani unayokumbana nayo katika kupata huduma za kisukari? (***Tiki jibu/majibu yanayostahili)***)

1. Umbali mrefu kutoka nyumbani mpaka kliniki [ ]
2. Muda wa kliniki siyo mzuri [ ]

3. Siwezi kumudu gharama za usafiri [ ]
4. Siwezi kumudu gharama za madawa [ ]
5. Siwezi kumudu gharama za vipimo vya maabara [ ]
6. Dawa hazipatikani [ ]
7. Huduma za maabara hazipatikani/ za tabu [ ]
8. Wahudumu wa afya ni wachache [ ]

Vipimo

1. Kiwango cha sukari kwenye damu _____mmol/l

2. Presha

   Systolic _____ mmHg

   Diastolic _____ mmHg

3. Glycosylated hemoglobin levels _____%

4. Urefu: _____ cm

5. Uzito: _____ kgs

APPENDIX 5: STUDY VARIABLES

The following are some of the study variables; they have been classified as general, structure, process and outcome variables.

General Variables:

- Date of birth
- Gender
- Height
- Weight
- Reason for consultation
- Period of observation

Structure Variables:

- Name of the clinic
- Health facility level
- Number of physicians treating people with diabetes
- Number of patients with diabetes registered
- Availability of trained clinicians and nurses
- Availability of eye referral
- Availability of nutritional advice
- Availability of diabetes education
- Availability of foot care referral
- Availability of physical exercise advice
- Availability of lab to estimate venous blood glucose
- Availability of lab to estimate renal function
- Availability of lab to perform urine testing
- Availability of lab to estimate Glucose in blood
- Access to equipment for performing electrocardiograms
- Availability of guidelines for management of patients with diabetes
- Availability of sphygmomanometers
- Availability of clinic space and furniture

- Availability of constant supply of medications, consumables
- Challenges faced in providing care

Process Variables:

- Evaluation of family history
- Evaluation of smoking history
- Evaluation of alcohol consumption
- Body weight measured
- Eye examination performed
- Foot examination
- Dental examination
- Dietary advice
- Diabetes education
- Non pharmacological treatment instituted in all patients
- ECG
- Capillary glucose levels
- Lipids
- Creatinine
- Urine
- Challenges faced in accessing care
- Estimated cost of seeking care per visit

Outcome Variables

- Hypertension
- Visual loss
- Retinopathy
- Neuropathy
- Heart disease
- Kidney disease
- Erectile dysfunction
- BMI

- **APPENDIX 6: INFORMED CONSENT**

MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES
DIRECTORATE OF RESEARCH AND PUBLICATIONS, MUHAS

ID-NO ☐☐☐

Consent to participate in this study

Greetings! My name is ….. I am working on this research project with the objective of investigating the quality of health care and treatment provided to patients with diabetes in Mwanza Region.

This consent form contains information about the study. To be sure you understand the study we ask you to read (or have it read to you) this consent form. This consent form may contain some words that you do not understand, please ask us to explain anything that you may not understand.

Reason for the research

This study is being conducted in order to get information on the quality is of health care that is being provided, the information obtained will be useful in improving the quality of diabetes care in the future.

General Information about the study

We are talking to patients like yourselves to get your opinions about the quality of health care that is being provided and generally your satisfaction with the services you are receiving at the diabetic clinics

Your part in the research

If you agree to participate in this study:

1. You will sit with a trained interviewer and answer questions about the health care services you are receiving at the diabetic clinic and your perception of the quality and the challenges you face in getting the services. The interviewer will be recording your responses in the questionnaire during the interview.

2. No identifying information will be collected from you during this interview, except your age and sex
3. You will be interviewed only once for approximately 30 minutes in a private setting. Before the interview you will be taken measurements of height and weight, blood pressure and blood sugar.

Confidentiality

I assure you that all the information collected from you will be kept confidential. Only people working in this research study will have access to the information. We will be compiling a report, which will contain responses from several diabetic patients without any reference to individuals. We will not put your name or other identifying information on the records of the information you provide.

Risks

You will be asked questions about factors that are associated with your health. Some questions could potentially make you feel uncomfortable. You may refuse to answer any particular question and may stop the interview at anytime.

Rights to Withdraw and Alternatives

Taking part in this study is completely your choice. If you choose not to participate in the study or if you decide to stop participating in the study you will not get any harm. You can sstop participating in this study at any time, even if you have already given your consent. Refusal to participate or withdrawal from the study will not involve penalty or loss of any benefits to which you are otherwise entitled.

Benefits

There may be no direct benefit to you from participating in this study. However, the information you provide will be useful in improving the quality of diabetes care in the future.

In Case of Injury

We do not anticipate that any harm will occur to you or your family as a result of participation in this study

Who to contact

If you ever have questions about this study, you should contact the study Coordinator or the **Principal Investigator, Dr. Mary .T. Mayige,** Muhimbili University of Health and Allied Sciences (MUHAS), P.O. Box 65001, Dar es Salaam (Tel. no. **0784255456**). If you ever have questions about your rights as a participant, you may call **Prof. E .F. Lyamuya, Chairman of the College Research and Publications Committee,** P. O. Box 65001, Dar es Salaam. Tel: **2150302-6** and **Dr. David .P. Urassa who is the supervisor** of this study (Tel. **0754 279553**).

Signature

Do you agree?

Participant Agrees [__]

Participant disagree [__]

I _____ have read/understood the contents in this form. My questions have been answered. I agree to participate in this study.

Signature of Participant _____

Signature of witness (if participant cannot read) _____

Signature of research assistant _____

Date of signed consent _____

APPENDIX 7: INFORMED CONSENT, SWAHILI VERSION

FOMU YA RIDHAA

MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES

DIRECTORATE OF RESEARCH AND PUBLICATIONS, MUHAS

Namba ya Utambulisho ☐☐☐

Ridhaa ya Kushiriki katika utafiti huu

Habari! Jina langu naitwa ..... nafanya kazi katika mradi huu wa utafiti wenye lengo la kuangalia ubora wa huduma zinazotolewa kwenye clinic ya kisukari kwa wagonjwa wenye kisukari katika mkoa wa Mwanza. Fomu hii ya ridhaa ina taarifa juu ya utafiti huu. Ili kuhakikisha kuwa unaelewa kuhusu utafiti huu tunaomba usome (au usomewe) fomu hii. Fomu hii inaweza kuwa na maneno ambayo ni magumu kuelewa, tafadhali usisite kuomba ufafanuzi kwa maneno ambayo hutayaelewa.

Malengo ya Utafiti

Utafiti huu una lengo la kukusanya taarifa ya hali ya ubora wa huduma zinazotolewa kwa wagonjwa wa kisukari katika mkoa wa mwanza. Taarifa hizi zitasaidia kuboresha huduma katika siku zijazo.

Taarifa kuhusu utafiti huu

Tunaongea na wagonjwa mbalimbali wenye kisukari kama wewe ili kupata maoni yenu kuhusu ubora wa huduma katika kliniki za kisukari, vile vile kupata maoni yenu kuhusu kuridhika kwenu na huduma zinazotolewa.

Nini kitatokea iwapo utakubali kushiriki

Ukikubali kushiriki katika utafiti huu yafuatayo yatatokea:

1. Utakaa na msaili/mtafiti aliyepewa mafunzo ya jinsi ya kuhoji na kujibu maswali yahusuyo ufahamu wako kuhusu huduma zinazotolewa kwenye kliniki za kisukari na matatizo yeyote mnayokumbana nayo katika kupata huduma. Msaili atakua ananukuu majibu yako katika dodoso wakati usaili ukiendelea.

2. Hakuna taarifa zozote za utambulisho tutakazokusanya wakati wa usaili isipokua umri na jinsia.
3. Utahojiwa mara moja tu kwa takriban dakika 30 kwenye sehemu ya faragha. Kabla ya usaili utapimwa urefu na uzito, shinikizo la damu na kupimwa sukari kwenye damu.

Usiri

Nakuhakikishia kwamba taarifa zote zitakazokusanywa kutoka kwako zitakua ni siri, ni watu wanaofanya kazi katika utafiti huu tu ndio wanaweza kuziona taarifa hizi. Tutajumuisha ripoti ambayo itakua na majibu kutoka kwa wagonjwa kadhaa wa kisukari bila kuweka taarifa zao za utambulisho. Hatutaweka jina lako au taarifa yoyote ya utambulisho kwenye kumbukumbu za taarifa utakazotupa.

Madhara

Utaulizwa maswali juu ya ufahamu wako kuhusu hali ya huduma za kliniki na hali yako kiafya. Baadhi ya maswali yanaweza kukufanya usijiskie vizuri. Unaweza kukataa kujibu swali lolote na unaweza kusimamisha usaili wakati wowote.

Haki ya kujitoa na mbadala wowote

Kushiriki katika utafiti huu ni uchanguzi wako, kama utachagua kutokushiriki au utaamua kusimamisha kushiriki hutapata madhara yoyote. Unaweza kusimamisha kushiriki katika tafiti hii muda wowote hata kama ulisharidhia kushiriki. Kukataa kushiiriki au kujitoa katika utafiti hakutaambatana na adhabu yoyote au upotevu wa faida yoyote unayotakiwa kupata.

Faida

Haitakuwepo faida ya moja kwa moja kwako kwa kushiriki katika utafiti huu, hata hivyo taarifa utakayotupatia itasaidia kujua hali ya huduma katika kliniki za kisukari vile vile katika kuboresha huduma za kliniki hapo mbeleni.

Endappo Utadhurika

Hatutegemei madhara yoyote kwako au kwa familia yako kwa kushiriki kwako katika tafiti hii.

Watu wa kuwasiliana nao

Kama una maswali katika utafiti huu unaweza kuwasiliana na **mratibu mkuu wa mradi, Dr. Mary .T. Mayige,** Chuo Kikuu cha Muhimbili, S.L. P 65001, Dar es Salaam (Simu. no. **0784255456**). Kama utakuwa na maswali yoyote kuhusu haki zako kama mshiriki unaweza kupiga simu kwa **Prof. E .F. Lyamuya,** ambaye ni **Mwenyekiti wa kamati ya chuo ya utafiti na machapisho,** S.L.P 65001, Dar es Salaam. Simu namba: 2150302-6 na **Dr. David .P. Urassa** ambaye ni **msimamizi wa utafiti huu** (Simu nambari. **0754 279553**)

Sahihi

Unakubali?

Mshiriki amekubali [__]

Mshiriki amekataa [__]

Mimi _____ nimesoma/nimeielewa hii fomu, maswali yangu yamejibiwa. Nakubali kushiriki katika utafiti huu.

Sahihi ya mshiriki _____

Sahihi ya shahidi (kama hataweza kusoma na kuandika) _____

Sahihi ya mtafiti muandamizi _____

Tarehe ya makubaliano _____