

HEALTH SEEKING BEHAVIOR OF DIABETIC PATIENTS IN KENYA.

BY

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Master of Science in Health Economics and Policy, of the University of Nairobi**

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DECLARATION

This is my original work and it has not been submitted for an award in any other institution.

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Signature

Date

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X53/85576/2016

This research Paper is submitted for examination with my approval as University Supervisor.

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Signature

Date

Prof. Anthony Wambugu

DEDICATION

To my dear mother, Hannah Muthoni Waweru for always reminding me the value of education and sincerely praying for me during the entire study period.

ACKNOWLEDGEMENT

Let me first thank God Almighty for his gift of life and his favor to undertake my studies.

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LIST OF ABBREVIATIONS

WHO- World Health Organization

GBD-Global Burden of Disease

IDF-International Diabetes Federation

VIF-Variance Inflated Factor

KNBS-Kenya National Bureau of Statistics

NCDs-Non-Communicable Diseases

TB- Tuberculosis

HBM- Health Belief Model

Php- Philippine Peso

Ksh- Kenya Shilling

ABSTRACT

Diabetes is a chronic disease that is progressive in nature, and can lead to irreversible complications or even death. The burden of care from complications and death among diabetic patients in Kenya is a major concern. Early diagnosis and treatment can help stem this burden. There are many people living with diabetes undiagnosed and only seek healthcare services when they have developed multiple chronic complications. Among people already diagnosed with diabetes mellitus, there is a percentage that is not on treatment, some never initiated treatment and others dropped out of treatment (Karinja et al 2019). This necessitate the development of strategies or interventions to encourage patients to seek professional or expert healthcare in order to reduce the complications and deaths among diabetic patients. This cannot be achieved without understanding the factors that are associated with the health seeking choices of diabetic patients. This study sought to understand the factors associated with the health seeking choices of diabetic patients in Kenya. The study is based on Grossmans investment model of health and has used probit model due to binary nature of the dependent variable. The data used is from the Kenya Integrated Household Budget Survey, 2015-2016. The study results revealed that 89% of diabetic patients were diagnosed by a health worker, while only 67% of the patients sought professional healthcare. The study found out that completing secondary school level of education or higher, salary, being diagnosed by a health worker, and being employed significantly influences the decision to seek professional healthcare. Being diagnosed by a health worker was found to have the strongest positive relationship with seeking professional healthcare. Based on these findings, the study therefore recommends that there is need for frequent community sensitization and awareness program on diabetes such as free medical camps directed to individuals running their own or family business and the unemployed. The study also recommends policies that would help to incorporate diabetes screening and treatment in all out-patient health services in the country.

CHAPTER ONE

INTRODUCTION OF THE STUDY

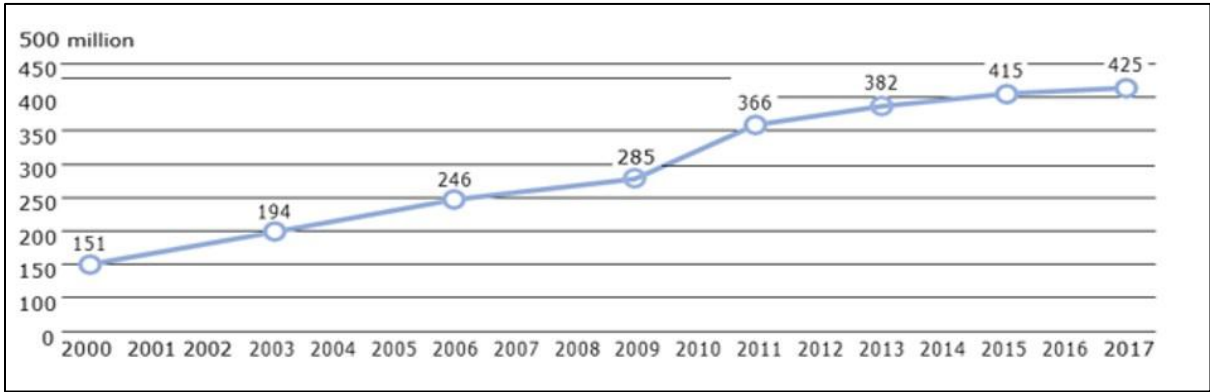
1.1 Background of the Study

The burden of diabetes is rising as over 872,000 people had the disease in the year 2015 compared to 28,300 in 1990, the health loss attributable to diabetes increased by more than 100% in that period (Global Burden of Disease, 2016). According to Government of Kenya, Ministry of Health Report (2015), non-communicable diseases amounts to more than one-half all admissions and over 55% of hospital deaths reported.

Diabetes disease presents as inability of the body to process blood glucose. According to WHO, (1999) diabetes mellitus presents in four types: Type 1 diabetes is found in children. Its genesis is that the pancreas is unable to produce insulin, and if any, very little. The patient is supposed to inject himself or herself with insulin to help the body transfer energy from the blood to the body cells. This type of diabetes is not preventable, and its cause is not known with the available knowledge (American Diabetes Association, 2009). Type 2 diabetes is a chronic condition where the body is not able to process sugar (glucose) or (not being able to effectively use the insulin it has produced). It was thought before as the disease of the affluent and the elderly but today, it has become of global concern since the people most affected by the disease are those of productive age (WHO, 1999). The third one is prediabetes, the individual lives with high blood sugar but not high enough to be type 2 diabetes. The fourth is gestational diabetes, a form of high blood sugar that is associated with pregnancy, hence, only women can develop this type of diabetes. All of them have the potential to progress to severe acute and chronic complications (Nguma, 2010).

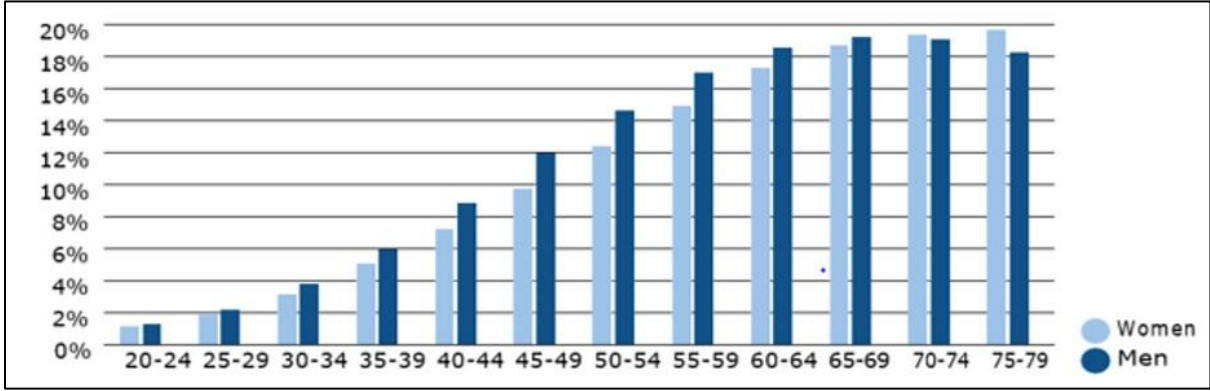
In 2017 it was estimated that almost 425 million people globally have developed diabetes, with 79% of those living in the developing countries (IDF, 2017). About 326.5 million of those people are classified to be of productive age (20-64 years) and with the current trend, it is estimated that the number of people of productive age with diabetes will rise to 438.2 million by 2045 (IDF 2017). Figure 1 shows the total number of people who have diabetes ranging from 2000 to 2017, and the numbers seems to increase rapidly. Figure 2 shows the prevalence of diabetes by age and sex. It shows more men having diabetes than women up to age 69 years, beyond that, more women than men have diabetes, may be due to women living longer than men.

Figure 1 shows the total number of persons (20-79 years) who have diabetes



Source: International Diabetes Federation, Atlas, 2017

Figure 2 shows the prevalence of diabetes by age and sex



Source: International Diabetes Federation, Atlas, 2017

Globally, approximately 212.4 million people which is about half of all people ages 20 years and above, who live with diabetes are unaware of their disease status (IDF,2017). Knowing that half the population with diabetes are not yet confirmed, there is global dire need for urgent screening, diagnoses and providing suitable care to those with diabetes (IDF, 2017). In 2017, about 4.0 million people died as a result of diabetes globally, which meant that every eight seconds a live would be lost (IDF, 2017).

In Africa, where majority of countries have vast remote rural areas, by 2015, the prevalence of diabetes was approximated to be 14.2 million people aged 20 years and above, and the percentage of not confirmed cases of diabetes was 69.2% usually as a result of scarce resources and low prioritization of diabetes screening (IDF,2017). In the same year, 321,100 deaths occurred with 79% of those deaths being of people in their productive age, and the main reasons for those high rates of mortality are late diagnoses and poor management of the patient during the course of the disease (IDF, 2017).

In Kenya, the prevalence statistics on diabetes disease have escalated rapidly in recent years, and is estimated to be 3.3% of the total population. The people who were confirmed to have diabetes by year 2017 were 458,900 cases (IDF, 2017). This is believed to be an underestimation as over 60% of people diagnosed to have diabetes in the country, normally present to the healthcare institutions with seemingly unrelated complaints. Majority two thirds of individuals who have diabetes are not aware of their disease status (IDF, 2007). In Kenya, much emphasis is normally on curative medicine as compared to limited advocacy on preventative medicine, opportunities for patients to be screened and diagnosed are rare. They only show up with severe symptoms of acute or chronic complications. (Pastakia et al., 2017). It is also emerging through previous studies that diabetes contributes to the risk of TB by almost three times and TB predisposes

people to diabetes (Hall et al, 2011. Young et al, 2009). Lately, diabetes is being associated with development of some cancers (Giovannucci et al, 2010).

Given the chronic nature of diabetes disease, the age group most affected is adults of productive age, the severity of its complications and the limited resources available, managing the disease both by the health sector, the affected individuals, and their families is devastating. Diabetes disease is costly (International Diabetes Federation, 2006). There is no strong public mechanism for funding health care services in most sub-Saharan countries, hence, health costs are borne by people paying from their pockets (Oyando et al, 2019. Karinja et al, 2019). According to WHO (2003), even with subsidized healthcare services, majority of the people in poor countries still pay for some of the services. Often, decisions are hard to make between healthcare and other responsibilities (WHO, 2003). With such financial difficulties individuals fail to seek healthcare services or they spend a high proportion of their income on healthcare (Nguma, 2010).

Diabetes complications pose exorbitant management costs in majority of developing countries, they are difficult and expensive to treat (Dagogo-Jack, 2006). To mention but a few, end organ failure or kidney failure which can only be treated through regular dialysis or kidney replacement through transplantation, eye surgery to correct retinopathy and percutaneous coronary intervention are not affordable neither are they offered even in national hospitals (Nguma, 2010). Limb amputation is accessible and can readily be done whenever a patient develops a gangrenous diabetes foot ulcers, but the problem arises where the patient would require a prosthesis and rehabilitation services. In third world countries, an artificial leg would be poorly developed due to outdated technology, hence, the profitable ventures of that patient virtually ceases (Prentice & Moore, 2005). Based on this grim scenario, a strong case should be made for

a steady focus on reducing the prevalence of diabetes and control of complications as top national priority in all sub-Saharan African countries (Dagogo-Jack, 2006).

1.2 Diabetes care services and policy in Kenya

Diabetes requires long-term follow up, with uninterrupted access to medication and special care. The expensive and scarce nature of insulin in Kenya coupled with inadequate patient follow up contributes to poor control of diabetic complications (Shiroya et al 2019). Among the diabetic patients in the country, only 41% of them within the productive age received treatment and only 7% of them had their condition managed, in 2015 (Shiroya et al, 2019). The devolution of healthcare from the national to county level has brought with it gains as well as draw-backs. Each county has its own priorities and sometimes NCDs may not be one of them (Kimathi 2017). The Kenyan Government in an effort to curb this menace of non-communicable diseases, came up with a policy, (Kenya National Strategy for the Prevention and Control of Non-Communicable Diseases, 2015-2020) that gives guidelines on how to reduce preventable burden on NCDs in Kenya (Kenya National Diabetes Educations Manual, 2010). However, a major gap remains between how diabetes is addressed within NCDs policy agenda and tackling diabetes in reality with respect to local implantation processes. The problem experienced is lack of political goodwill to enable implementation due to scarce resources and competing priorities. (Shiroya et al, 2019).

1.3 Problem Statement

Diabetes is a chronic disease that is progressive in nature and can lead to irreversible complications or even death. Many people of all ages and socio-economic status are living with diabetes undiagnosed, they only come to seek healthcare services when they have developed multiple chronic complications which leads to irreversible disability or even death (Shankar et

al., 2017). Complications from diabetes disease, e.g. kidney failure due to either delayed healthcare seeking or not adhering to treatment regimen, can drive families to sell assets for them to be able to pay for treatment depending on the type of treatment prescribed by the doctor, either constant dialysis or kidney transplant (KNBS, 2011). Among people diagnosed with diabetes mellitus, there is a percentage that is not on treatment, some never initiated treatment and others dropped out of treatment (Karinja et al, 2019). Despite the increasing prevalence of diabetes, studies examining factors associated with healthcare seeking decision among diabetic patients are scarce. This study addresses the following question;

1. What factors are associated with health seeking decision among diabetic patients in Kenya?

1.4 Objectives

The general objective of the study is to assess the health seeking choices of diabetes patients in Kenya.

1.4.1 Specific Objectives

The specific objectives of the study are:

1. Determine the factors associated with the healthcare seeking choices of diabetic patients in Kenya.
2. Draw implications based on the study findings.

1.5 Significance of the study

The prevalence of diabetes in Kenya has increased. The burden of care from complications and death among diabetic patients in Kenya is a major concern. Early diagnosis and treatment can help stem this burden. There is a need to understand the health seeking choices among diabetic patients especially in relation to health facilities usage and consumption of conventional

medicine. The findings of this study will be vital in developing strategies or interventions to encourage patients to seek professional or expert healthcare and reduce the complications and deaths among diabetic patients. The study can also stimulate interest for further studies into the economic burden of diabetes on households and the economy.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter present a detailed review of theories of health seeking behavior. It then presents empirical studies of health seeking behavior among diabetic patients from around the world. The final section provides an overview of the chapter.

2.1 Health seeking behavior

2.1.1 Grossman's Investment Model of Health

This model was propounded by Grossman (1972) and explains the health seeking behavior of a patients using the utility concept. The model asserts that a healthy life or health is an output which yield utility in form of many happy days and is obtained from use of medical care, healthy lifestyle and diet as input in health production. Here, the individual or patient is modelled as both a consumer and a producer of health. An individual's consumption of good health affects productive hours and generates utility. The individual produces health by making health production choices such as regular exercises, positive healthy behaviors, and seeking healthcare to obtain good health.

In producing health, healthcare is one of the input (Dewar, 2017). Every person is modelled as beginning life with "innate" health, which behaves in the same way as capital: health runs down or wears out over a period of time as age catches up, but with investments in healthy life styles, and seeking medical care, health can be restored. Grossman therefore came up with the investment model of health which explains the demand for healthcare or medical care as based on expected utility of seeking healthcare being conditional on both the cost of healthcare (health capital) and the rate of depreciation of the health stock (Dewar, 2017). The utility however,

according to the model is a derived utility since, individuals do not demand healthcare for its own sake but for the sake of improving or prolonging one's life and happy days through improvement in health. In this study, this model helps in modelling the healthcare seeking behavior of a diabetic patient in a rational consumer perspective, with the motive of maximizing expected utility. The patient does this by making a choice between seeking professional diabetic care or treatment and others (Dewar, 2017).

2.1.2 Health Belief Model

Becker and Maiman (1974) developed the health belief model to explain and predict health related behaviors, particularly in regard to self-care activities. Health belief model proposes that person's behaviors can be anticipated on the bases of some issues which the person may visualize (perceived severity or seriousness, perceived susceptibility, perceived barriers, perceived benefits of taking action). Individuals have different perceptions towards a health problem (Adejoh, 2014). Those who consider the health problem as serious and that they are susceptible, easily seek help to reduce severity of symptoms and occurrence of complications. Health belief model is founded on the belief that a person will act when he/she visualizes that action taken will prevent, reduce, or eradicate a health problem (Vazini and Barati, 2014). These concepts of people's readiness to take action, motivation to take action described by health belief model, help better tackle the problem of dealing with negative behaviors like alcohol consumption, obesity or eating too much.

The HBM has been applied mostly in preventive health behaviors, sick role behaviors, and also to estimate utilization of healthcare services (Adejoh, 2014). With respect to this study, HBM helps to explain the choice of healthcare or the health seeking behavior of diabetic patients from the perspective of the patient's beliefs. That is the diabetic patient's perception about the severity

or seriousness, susceptibility, barriers, benefits of taking action. From this theory factors which help capture these beliefs or perception of the diabetes such as duration of the diabetes, sex of the patient, cost of treatment, religious beliefs, among others would be considered (Adejoh, 2014).

2.2 Empirical literature

In this section the study presents the various studies conducted on the health seeking behavior of diabetic patients.

Yinzin et al (2017) conducted a study in China to investigate how availability of health workers influence healthcare seeking behavior of diabetic patients. The study used data from China National Service Surveys in 2008 and 2013 combined with facility data from counties. Healthcare seeking behavior was defined as healthcare utilization and distribution of health specialists in diabetes disease to attend to diabetic patients. Binomial regression and Multinomial logit model was used to explain the effects of the healthcare workers on choice of health provider by diabetic patients. The controlled factors in this study included: comorbidities, residence location, and time period. After accounting for all likely endogenous covariates, with one additional physician at primary health centers, the average outpatient visits grew by 25% among diabetic patients. The probability of a diabetic patient visiting primary healthcare centers increased 1.14 times with one additional physician. The results showed that there was positive correlation between number of physicians and outpatient visits by diabetic patients at both county facility and primary health centers. The positive influence was felt more in rural areas than in urban areas.

Abidin et al (2014) conducted a cross-sectional study from October 2011 to April 2012 with the aim of describing the healthcare seeking behavior and its determinants among diabetic patients living in rural settlements of Selangor. The study described healthcare seeking behavior as

obtaining modern treatment from public or private facility. 460 participants from 17 villages were selected using simple random sampling method. Data was collected using structured face to face interview. Logistic regressions were used in selecting variables and explaining the relationship between dependent variable and independent variables. Hosmer-Lemeshow goodness of fit test was used to check the fitness of the model. The study found that absence of other diseases, starting treatment within a day after diagnosis, and those patients with close family support determined their healthcare seeking behavior. The study findings also revealed that 14.6% of the diabetic patients sought modern treatment from public or private facilities in Tanjong Karang, Selangors.

Karinja et al. (2019) also, conducted a study on care-seeking behavior among diabetic patients, and high blood pressure in some identified rural community healthcare centers located in nine counties in Kenya between September 2016 to February 2017 with 1100 respondents. The correlation between disease status, socio-demographic factors as well as health seeking behavior was accessed using Chi squared test. The study showed that a significant number of respondents, had only primary school education, were kikuyus, had no formal employment and were aged above 60 years. Those with some form of health security cover in their households were 24.6%. Multivariate logistic regression model was used to identify factors predicting health seeking behavior, respondents who had family support during treatment, and those who rated their health status as good, and also being admitted in hospital during the year were positive predictors of health-seeking behavior for the respondents. Among respondents with both hypertension and diabetes, working as farms employees contributed to patients not seeking healthcare compared unlike the unemployed ones. The largest number of respondents (89.7%) were on conventional

treatment while (1%) sought treatment exclusively on traditional medicines. Another (9%) never sought any type of treatment.

Thapa et al (2018) using a community based cross-sectional data from 102 diabetic patients, assessed the factors associated with healthcare seeking behavior among the type 2 diabetic patients living in Baniyani village in eastern Nepal from 1st December 2016 to 31st May 2017. He defined healthcare seeking behavior as seeking treatment either through oral medication or insulin injection or both from a health facility. Chi-square and Fisher exact test at 5% level of significance and 95%CI were done to see the association between dependent and independent variables. Binary logistic regression model was used to identify factors associated with health seeking behavior. The study found out that 49% of the respondents sought treatment from public health facilities, 94.5% were using modern medicines and very few were using alternative medicines. The results also showed that 77.5% of the respondents were literate, 68.4% had formal education and 63.7% accessed health facility with a walk of 30 minutes. The study revealed that, consumption of alcohol (OR: 0.236, 95%CI: 0.078-0.713), and presence of complications (OR: 3.903, 95% CI: 1.242-12.267) and perceived severity of the disease (OR: 3.403, 95% CI: 1.102-10.504) were the three main significant determinants of health seeking behavior among diabetic patients in Baniyani village. However, age, education, marital status, smoking habit, duration of disease, presence of other diseases, family history of diabetes, place of diagnoses was not found significant with healthcare seeking behavior. Majority (84.3%) of the patients were using conventional medication from health facilities.

A cross-sectional study by Bhosale et al (2017) sought to determine healthcare- seeking behavior and the health expenditure incurred for the treatment of diabetes among diabetic patients in

Kozhikode, Kerala, India. Data was collected by in-depth interviews of diabetic patients identified in a house-to-house survey. The study found that 82% of the respondents were adhering to treatment and 67% were on regular monthly checkups. Majority representing 78% were using oral antidiabetics while few of about 6.3% were on insulin. 65.9% of the respondent visited a private facility to obtain treatment for diabetes, the rest visited government hospitals. Cost of drugs, transportation, laboratory requests, consultation and hospitalization were found to affect health seeking behavior of the patients in Kerala.

Basity (2014) conducted a study to explore the health seeking behavior of patients with diabetes in a Damghan village in relation to patients' knowledge and responsiveness to the symptoms of diabetes and resort pattern in a multiple therapy system. The study also examined their resort to substitute, supplementary or complementary therapeutic system. In-depth interviews were conducted on 17 respondents. The results showed that villagers were using different types of therapies and the factors that determined the decisions were religious, economic, and educational. The study revealed that 14 patients were using modern treatment from health facilities, 12 consulted traditional healers and consumed herbal medicines, 5 patients dropped out of treatment, and 16 patients sought ritual and sacred interventions together with modern medicine.

Rutebemberwa et al. (2013) tried to explore healthcare seeking behavior and how traditional healers manage diabetic patients in Uganda. The aim was to understand how modern medicines and traditional medicines were used by diabetic patients. The study revealed that healthcare was first sought from health institutions before patients transferred to traditional healers. The study revealed multiple factors that influence diabetic management from perceived dissatisfaction with

modern medicine, quality of services received not as expected, which is affirmed by (WHO, 2013) that 80% of the all people in African consult traditional healers for their healthcare demands. They observed that, diabetic patients are prone to moving between different healthcare providers due to community influence and beliefs that traditional medicine is cheap and readily available. Hjelm and Atwine (2011) conducted a qualitative study among diabetic patients in Uganda to explore the use of alternative medicine and traditional healers. Data was collected by interviewing 16 females and 8 males who were aged 25 years and above. The study revealed that respondents mainly looked for healthcare among health professional mainly doctors and nurses due to severe symptoms of the disease or for glycemic control. Among them, there are those who turn to traditional healers for advice concerning their ailments, and are given herbs and food supplements, when they think healthcare has failed. About half of the women reported seeking advice from traditional healers to control blood sugar and blood pressure and a few of them to treat joint pains. Only two of the males consulted the traditional healers and were treated with herbs for one to control hypertension and the other to cure diabetes. Reasons given for consulting traditional healers was when the patients felt that healthcare had failed to cure diabetes or other comorbidities and complications. Reasons given by those who never wished to consult traditional healers was that, they feared the risk of diabetes disease worsening and developing end organ complications, and also cited the cost implications (herbal medicines are expensive). Gender was found to influence healthcare seeking behavior, as males were using private for-profit institutions where services were costlier, while females were using public facilities that offer free health care services. The study concluded that healthcare services were mainly provided by doctors and nurses in government and private hospitals. Women had regular follow-up of diabetes disease due to multiple health problems. The study revealed that living conditions

of diabetic patients, personal beliefs, and gender related issues were influencing healthcare seeking behavior.

Dominquez (2010) conducted a study in order to explain the healthcare seeking behavior of type 2 diabetic patients and the factors that influence their healthcare seeking behavior. 209 patients were recruited for the study from different clinics in Baguio city. A cross-sectional study was done with 131 women and 78 men, frequencies and means of variables were calculated. To assess the association between independent variables with dependent variable, Chi-square analysis-test and ANOVA were used. The findings of the study were that 46.3% of the respondents were over 60 years, 86.6% were either married or widowed, 48.3% had reached college level of education, and 37.9% had a monthly income of less than Php 5000, 47.8% had no health security cover, 61.2 were nonsmokers, 81.8% never consumed alcohol, 42.1 % had lived with diabetes between 1-5 years, and 55% had other chronic illness, family history of diabetes. The study found out that 73.7% of diabetic patients sought treatment in clinics. Financial constrains prevented 43.5% of patients from consulting their doctors on regular basis and some resulted to self-medication. The study revealed that age, gender, socio-economic status, educational attainment affected the healthcare seeking behavior.

Nguma (2010) explored factors that influence health seeking and health related behavior to care and management of adults with type 2 diabetes mellitus in an urban setup in Tanzania. Data was collected between March and June 2007 using focus group discussions and in-depth interviews with 20 regular and 10 irregular clinic attendees, 14 community health workers, 7 health professionals, and 6 national health officers. The results showed that decisions as to where care services were sought were between traditional and biomedical care services, with biomedical care services often not being the first treatment choice due to their inaccessibility, high cost and

payment policies and perceived unsatisfactory care delivery arising from the poor attitude of some service providers. The study revealed that some patients and caregivers perceived the treatment from traditional and faith healers and/or herbalists to be more convenient, more friendly and promising than that provided by biomedical care facilities. The study concluded that most patients were not able to afford biomedical care due to the current system of cost sharing and the absence of health insurance.

2.3 Overview of the Literature Review

There is limited literature available in the studies on healthcare seeking behavior of diabetic patients, especially in developing countries where almost 70% of diabetic patients reside. However, based on the available literature from other countries, living conditions, gender, and cultural beliefs about diseases, religion, education, health security cover, distribution of diabetic specialists and health facilities were some of the factors found to have been associated with the health seeking choices of diabetic patients Hjelm & Atwine (2014), Rutebemberwa et al (2011). Basiya, (2014). Karinja et al (2019). Nguma, (2010). Yinzin et al (2017). Thapa et al (2019). Most of the studies reviewed showed that diabetic patients sought treatment from different health providers and resorted to use of multiple therapy Karinja et al (2019), Basiya (2014), Domiguez (2010), Rutebemberwa et al (2013), Bhosale et al (2017). The studies applied different methods of data collection and analysis, qualitative and quantitative methods, logit models among others. Studies on this topic are scarce in Kenya and the one done in Kenya by Karinja et al (2019) consisted of hypertensive patients, diabetic patients, and patients with both diseases. This study will specifically address diabetes disease, and factors associated with the health seeking choices of diabetic patients in Kenya.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter presents a detailed explanation of theoretical and empirical framework used in this study.

3.2 Theoretical Framework

Grossman (1972) suggests that an individual would want to have many healthy days in his/her life and feel happier. This drives a person to consider consumption of healthcare services. If an individual decides to seek healthcare services, he/she will obtain his/her utility from being healthy, and will, thus, have many days full of health and also be optimally productive. This will lead to a patient in choosing either to consume professional healthcare services or alternative care (traditional medicines/home remedies).

In a functional form the utility of a patient based on the Grossman model depends on the health status of the patient which also depends on the healthcare services consumed Dewar (2017). This can be expressed as follows:

$$U = f(Y, C; X_h) \dots\dots\dots (3.1)$$

Where (Y) denotes the health status of the diabetic patient and U is the utility obtained from being healthy. C other consumables. The health status depend on the consumption of healthcare services X_h

$$Y = f(X_h) \dots\dots\dots (3.2)$$

X_h Is determined by the price of healthcare service(P), income of the patient(I), and socio-demographic characteristics of the patient Z such as age, education, gender, and marital status, expressed as follows:

$$X_h = f(P, I, Z) \dots\dots\dots (3.3)$$

Therefore, equation (3.3) expresses the functional form of the equation the study will be estimating in order to achieve the objective of finding the factors associated with health seeking choices of diabetic patients in Kenya.

3.3 Econometric Model Specification

Due to the dichotomous (binary) nature of the dependent variable, the linear probability model, binary probit model will be employed to achieve the objective of the study. The study chose the probit model because it is interested in the probability of the diabetic patient choosing professional care over any other services, and not the log odds when using the logit model. Moreover, the logits or the log odds are not so restricted to be between 0 and 1. Though the odds can be used to estimate the probabilities, using such approach under logistic model, we fail to achieve linearity of the probabilities in the repressors. The binary probit model would be employed in the study to estimate the reduced form of equation (3.3), shown in equation (3.4).

$$X_h = \beta_0 + \beta_i X_i + \varepsilon, \text{ where } i = 1, 2, \dots, k \dots\dots\dots (3.4)$$

X is all the independent variables indicated by equation (3.3), β are parameters to be estimated and ε is the stochastic random term indicating other factors which are not captured by the model. In the model, the assumption is that the error term (ε) takes a normal cumulative distribution function.

Following from the Grossman model, the decision of a diabetic patient to choose professional healthcare or not depends on the expected utility (which is unobservable or latent) derived from professional healthcare given factors such as the ones in equation (3.3). The observed outcome X_h is linked to an unobserved variable (latent variable) which in this case is the expected utility obtained from accessing professional healthcare as a diabetic patient. It is based on this expected utility that the patient makes his/her decision whether to seek professional healthcare or not. The higher the expected utility (V), the higher the probability of the patient choosing professional diabetic care. It is assumed that there exist a threshold level of expected utility (Z^*) which is also unobservable but beyond it the patient will access professional healthcare and below it, the patient will not. The dichotomous dependent variable and probability of the patient accessing professional healthcare can be expressed as follows:

$$X_h = \begin{cases} 1 & \text{if } V \geq V^* \\ 0 & \text{if } V < V^* \end{cases} \dots\dots\dots (3.5)$$

$$\Pr(X_h = 1 | X) = \Pr(\geq V^*) = \Pr(V^* \leq \beta_0 + \beta_i X_i) = F(\beta_0 + \beta_i X_i) \dots\dots\dots (3.6)$$

$F(Z)$ follows a standard normal cumulative distribution function (CDF) with mean 0 and variance σ^2 . The ultimate model is therefore specified as follows:

$$X_h = f(\text{price of healthcare service } (P), \text{ income of the patient } (I), \text{ and sociodemographic characteristics of the patient } (\delta)) \dots\dots\dots (3.7)$$

$$X_h = \beta_0 + \beta_1 X_1 + \dots + \beta_{13} X_{13} + \varepsilon \dots\dots\dots (3.8)$$

Where:

X_h = Healthcare seeking behavior

$\beta_0 \dots \beta_{13}$ = parameters to be estimated

$X_1 \dots X_{13}$ = the independent variables (see table 3.4)

ε = stochastic error term

Table 3.4 Variable Description and Measurement

Variables	Measurement	Expected	Reference
Dependent			
Healthcare seeking behavior	1 if diabetic sought professional healthcare, 0 otherwise		Rutebemberwa et al. (2013)
Independent			
Price of healthcare service (P)			
Cost of Treatment	Total out-and in-patient service cost for the last 1year measured in Kenyan shillings	Negative	Bhosale et al (2017)
Income/Assets of the patient			
Salary	Last month's basic salary measured in Kenyan shillings	Positive	Dominquez (2010)
Patient has insurance cover	Dummy, 1 if yes and 0 if no	Positive	Karinja et al (2019)
Sociodemographic characteristics of the patients			
			Hjlem &Atwine (2011)
Sex of the patient	1 = female, 0=male	Positive	
Employment Status	1 = employed, 0 = unemployed	Positive	Thepa et al. (2018)
Age of the patient	In years	Positive	Karinja et al (2019)
Marital Status of the patient	1= married and 0 = not married	Negative	Nguma (2010)
Completed Primary School	1=yes, 0 = No	Positive	Basity et al. (2014)
Completed Secondary school and above	1=yes, 0 = No	Positive	Dominquez (2010)
Diagnosed by health worker	1=yes, 0 = No	Positive	Rutebemberwa et al. (2013)

3.4.1 Explaining expected signs of variables

Cost of Treatment/healthcare services: An affordable cost, reasons given by patients for not adhering to the treatment were financial constraints and health facilities being far Bhosale et al (2017). Karinja et al (2019), Basity 2014, Abidin et al 2014. These studies were conducted in rural areas, where majority of the people are poor, and that would hinder diabetic patients from accessing healthcare services.

Who diagnosed the patient: Whether a health professional or traditional healers, herbalists, self Who diagnosed the patient would be important as the patient will tend to follow the advice given during diagnoses. A healthy professional would encourage the diabetic patient to adhere to the treatment prescribed, importance of adherence, educate the patient about the disease. If diagnosed by others, chances of consuming modern healthcare decreases. Rutebemberwa et al (2013) observed that, diabetic patients are prone to moving between different healthcare providers due to community influence and beliefs that traditional medicine is cheap and readily available.

Income/Assets of the patient: A diabetic patient with insurance cover will consume more healthcare services due to affordability (not much out-of-pocket spending). Karinja et al (2019) study revealed that only 24.6% of the 1100 respondents had some form of health security cover in their households. Nguma 2010 study found out that respondents did not have any form health security cover.

Sex: Generally, women are known to seek healthcare more than men, reason, women are more sensitive to changes in their bodies than men. Men tend to neglect themselves. Women tend to have more health problems than men. Hjelm & Atwine (2011) study found out that gender influenced health seeking behavior, as males were using private-for-profit institutions where

services were costlier, while females were using public health facilities that offer free healthcare services.

Employment Status: Diabetic patients who are employed are more likely to consume healthcare services than those who are not. The relationship could also be the other way round, casual laborers and those who run family business, as they would fear losing daily wages for taking time off work to go to hospital. Karinja et al (2019) study revealed that, patients working in farms and running family businesses had irregular visits to clinics.

Age: Increase in years contributes to body functions slowing down, hence lowering one's immunity. An older diabetic patient will more often than not develop other diseases than a young diabetic patient. Older patients will consume more healthcare services than young patients. Majority of the respondents were above 60 years of age (mean age 64 years) Karinja et al (2019).

Education Levels: Four dummy variables in this study. Education makes the diabetic patient more aware of the diabetes, availability of healthcare services, and he/she is able to use the information to achieve good health or maintain it. In the study done by Basity (2014), a majority of those studied were illiterate.

Marital status: Married people are thought to seek healthcare services more than singles, reason could be, the spouse would be sympathetic and encourage the sick to seek healthcare, also could help in settling the cost incurred during treatment. However, a study conducted in Tanzania by Nguma (2010), revealed that men are the decision makers and control all the family resources. Woman cannot spend money on treatment without permission or even visit a healthcare giver alone.

3.5 Diagnostic Tests

The study tested for the presence of multicollinearity which can occur as a result of high correlation between any two independent variables. Presence of multicollinearity makes a significant variable insignificant by increasing its standard error. Correlation matrix and variance inflated factor(VIF) will be used to assess the degree of multicollinearity Gujarati, (2008). The variable with the highest p-value is dropped if multicollinearity is present.

The study tested for heteroscedasticity which occurs when the variance for all observations are not the same. To detect heteroscedasticity, one informal way is by creating a residual plot, where you plot the least squares residuals against the explanatory variable, if there is an evident pattern in the plot, then heteroscedasticity is present. A formal mathematical way is by use of robust Breusch Pagan test which involves using a variance function and using X^2 test to test the null hypothesis. Gujarati, (2008).

3.6 Data Source

The study used the 2015/2016 Kenya Integrated Household Budget Survey data conducted Kenya National Bureau of Statistics within a 12-month period from the year 2015 to the year 2016. A nationwide survey which contains information on all facets of household lives including health and specific diseases that households suffer including diabetes. This thus makes it useful for this study. The survey covered a total national representative sample of 24.000 households, drawn from all the 47 counties.

CHAPTER FOUR

PRESENTATION AND DISCUSSION OF RESULTS

4.1 Introduction

This chapter reports the findings obtained from the data analysis as well as their interpretation which include the descriptive and econometric analysis. It also reports the diagnostic test results and their implication on the model.

4.2 Descriptive Analysis

This section describes the variables used in the analysis. It reports the averages, standard deviation, and the maximum and minimum values of a sample of 187 diabetic patients, as shown in table 4.1

Table 4.1: Description of variables

Variable	Mean	Std. Deviation	Minimum	Maximum
Healthcare seeking behavior (Sought professional care=1)	0.67	0.47	0	1
Cost of treatment (Ksh)	17947.27	67537.97	0	636200
Salary (Ksh)	11176.8	27138.89	50	270000
Diagnosed by a health worker (yes=1)	0.89	0.31	0	1
Age of the patient (years)	59.12	17.38	6	95
Youth	0.04	0.19	0	1
Working age	0.54	0.50	0	1
Elderly	0.42	0.50	0	1
Sex of the patient (female=1)	0.59	0.49	0	1
Married (yes=1)	0.67	0.47	0	1
Never married (yes=1)	0.33	0.47	0	1
Completed primary school (yes=1)	0.73	0.44	0	1
Completed secondary school and above (yes=1)	0.27	0.44	0	1
Employment Status (employed=1)	0.64	0.48	0	1
Paid employee	0.14	0.35	0	1
Own or run family business	0.50	0.50	0	1
Unemployed	0.36	0.48	0	1
Patient has insurance cover (yes=1)	0.35	0.48	0	1

The result from table 4.1 shows that out of a total 187 diabetic patients, majority of them about 89% were diagnosed by a health worker. However, only 67% of the diabetic patients sought professional healthcare. The average total cost of treatment, which comprises the out- and in-patient service cost for last the 12 months is approximately Ksh17947, with the lowest being 0 and the maximum being 636200. The average salary measured by last month's basic salary, on the other hand, is approximately Ksh 11176, with a minimum of Ksh50 and maximum of Ksh 270000.

The result also shows that majority of them are married, do not have insurance cover and are employed (Own or run family business and paid employee). However, with respect to the sex of the patients the difference is not very large, but majority of those who took part in the study were females accounting for 101 persons. The reason could be that women are known to seek healthcare quickly and often whenever they encounter a health problem than men. The average age is approximately 59, the lowest age is 6 and the maximum is 95. This suggest that majority of diabetic patients in the study are within the productive age, and that if diabetes disease is properly managed, one can live full life.

The study further subdivided the sample into age groups; youthful; working age; elderly. The result shows that 0.04%, 54% and 42% are within youthful, working age and elderly age groups respectively. This also suggest that most of the diabetic patients are within the working age group followed by the elderly age group. Though the percentage of the youth is small, this shows that diabetes disease cuts across all ages. Regarding education, majority of the patients had completed primary level, but as you advance higher in education ladder, the number was decreasing.

4.3 Diagnostics Result

In order to ensure correct and reliable estimate and conclusion, the study carried out relevant tests. These were multicollinearity and heteroscedasticity. The degree of collinearity between the independent variables will not be a problem to the results obtained if the mean value of VIF is less than 10 (Kennedy, 1992). With respect to this study, it can be concluded that multicollinearity is not an issue in the model employed since the overall mean value is far less than 10. This shown in table 4.2. and correlation is reported in the appendix

Table 4.2: Test for Multicollinearity

Variable	VIF	1/VIF
Cost of treatment	1.12	0.895859
Salary	1.07	0.93629
Diagnosed by health worker	1.05	0.950095
Age of the patient	2.43	0.411184
Sex of the patient	13.2	0.075763
Married	14.32	0.069809
Completed secondary school and above	1.27	0.788208
Patient has insurance cover	1.3	0.768296
Never married	1.29	0.775691
Employment Status (employed=1)	1.14	0.875068
Mean VIF	3.82	

The study also used the Breusch Pagan test for heteroscedasticity and the p-value for the chi-square test statistic was found to be below 0.5 level of significance. The study therefore rejected the null hypothesis of constant variance of the residual and concluded that heteroscedasticity was present in the model. To correct that, the study used the robust standard error approach to obtain correct estimates of the standard errors. The result of the test is shown in table 4.3

Table 4.3 Test for Heteroscedasticity

Breusch-Pagan / Cook-Weisberg test for heteroscedasticity		
Ho: Constant variance		
chi2(1)		3.78
Prob > chi2		0.0519

4.3 Factors influencing the health seeking choices of diabetic patients

After, correcting for heteroscedasticity, the study concluded on the model with robust standard errors in determining the significant factors that influence the health seeking behavior of diabetic patients. The result is reported in table 4.4.

Table 4:4 Probit Model with Robust Standard Errors

Variable	Coefficient	Robust Standard Error.	z	P>z
Cost of treatment (Ksh)	-7.9E-08	1.6E-06	-0.05	0.96
Salary (Ksh)	2.4E-05	0.0000124	1.96	0.05
Diagnosed by health worker (yes=1)	1.4447	0.3678	3.93	0
Age of the patient (years)	-0.0078	0.0104	-0.76	0.449
Sex of the patient (female=1)	-0.6547	0.8174	-0.8	0.423
Female*Age	0.0106	0.0130	0.81	0.417
Never married	-0.1611	0.2310	-0.7	0.486
Completed secondary school and above	0.5418	0.2479	2.19	0.029
Employment Status (employed=1)	-0.5367	0.2346	-2.29	0.022
Patient has insurance cover (yes=1)	0.2221	0.2294	0.97	0.333
Constant	-0.2643	0.7152	-0.37	0.712
Observation	187			
Wald Chi2(10)	25.36			
Prob > Chi2	0.0047			
Pseudo R2	0.1434			

Table 4.5 Probit Marginal Effect

Variable	dy/dx	Standard Error	Z	P>z
Cost of treatment (Ksh)	-2.4E-08	4.9E-07	-0.05	0.96
Salary (Ksh)	7.5E-06	3.8E-06	1.98	0.048
Diagnosed by health worker (yes=1)	0.4452	0.0976	4.56	0
Age of the patient (years)	-0.0004	0.0020	-0.2	0.839
Sex of the patient (female=1)	-0.0074	0.0688	-0.11	0.915
Never married	-0.0496	0.0707	-0.7	0.483
Completed secondary school and above	0.1670	0.0743	2.25	0.025
Employment Status (employed=1)	-0.1654	0.0702	-2.36	0.018
Patient has insurance cover (yes=1)	0.0684	0.0701	0.98	0.329

The result shows a negative relationship between the cost of treatment and the probability of diabetics seeking professional diabetic healthcare. This implies that as the cost of treatment increases, it becomes costly for the diabetics to seek professional treatment. In other words, it reduces their purchasing power in demanding professional healthcare. This however, was found not to be statistically significant. The relationship corroborates with the findings of Bhosale et al. (2017) who found out that cost of services including drugs and consultation affect the health seeking behavior of diabetic patients in Kerala, India.

Salary measured by last month's basic salary was found to increase the chances of the diabetics seeking professional healthcare. This is because increase in salary, improves one's socioeconomic status, and thus increase their purchasing power in demanding professional

healthcare. This result is as expected and it is statistically significant at 5% level of significance. This is similar to the results obtained by Dominquez (2010) in Damghan village where socioeconomic status was found to be a significant influencer of the health seeking behavior of diabetics.

The study moreover, found a strong statistically significant positive relationship between a health worker diagnosing than any other person and probability of seeking professional diabetic care. The result from the marginal effect shows that being diagnosed by a health worker other than traditional healer or any other means increases the probability of seeking professional diabetic care by 44%. The relationship is statistically significant at 1% level of significance. This could be explained by the fact that health workers are more likely to advise them to seek professional healthcare after diagnosing the disease. A healthy worker would encourage the patient to adhere to treatment, importance of adherence, educate the patient about the disease. If diagnosed by others, chances of consuming modern healthcare decreases. This concurred with the findings obtained by Rutebemberwa et al (2013) in Uganda that observed that, diabetic patients are prone to moving between different healthcare providers due to community influence and beliefs that traditional medicine is cheap and readily available. This also concurred with the results obtained by Hjelm& Atwine (2011) in Uganda that reported that most of diabetic patients who never wished to consult traditional healers was that, they feared the risk of diabetes disease worsening and developing end organ complications.

Sex was also found not to be a significant factor that influences the decision to seek professional healthcare over other diabetic cares. This could be explained by the fact that almost equal percentage of males and females suffered diabetes. The result however, shows a negative relationship between the probability of seeking professional healthcare and sex of the patients.

Age was found to reduce the probability of seeking professional healthcare contrary to the study prediction, which could be explained by the fact that most of them are through with bringing up their children and not much they are looking forward to. Those employed are at least approaching retirement and as result their earnings position worsens as they grow old. Thus reducing the ability to afford professional health given that it is costly as established in the descriptive analysis above. This however, was not statistically significant which may be due to the fact that almost all are at least approaching elderly age. Also comparing male and females, as females grow old they are more likely to seek professional diabetic care than males. This can be explained by the fact that females are more sensitive to their body changes, more so health problem. This also was not statistically significant.

The result also shows that patients who are not married are less likely to seek professional healthcare than those who are married. This could be explained by the fact that married persons are financially and morally better off in seeking professional care than those who are not, since they can receive support from their partners financially and in the form of moral encouragement. This is in line with the findings of Abidin et al. (2014) in Selanger and Karinja et al. (2019), who discovered that family support improves the health seeking behavior of diabetics, however not significant in this study. Moreover, this result together with that of sex of the patients and age supports the findings of Thepa et al. (2018) who found these factors not to be a significant determinants of the healthcare seeking behavior among the type 2 diabetic patients living in Baniyani village in eastern Nepal.

Also, as expected, the patients who have acquired secondary and higher level of education are more likely to seek professional healthcare than those who acquired only primary. Being educated to the secondary level and above as compared to completing primary school increases

the probability of seeking professional diabetic healthcare by approximately 17%. This could be explained by the fact that the higher the level of education, the more the diabetic patients becomes aware of the disease, availability of healthcare services, and he/she is able to use the information to achieve good health or maintain it. This relationship was statistically significant at 5% level of significance. This supports the finding of Basity et al. (2014) who found that educational attainment improves the health seeking behavior of diabetic in Uganda.

Contrary to expectation, the study found that being employed in the informal sector significantly reduces the probability of the diabetics seeking professional diabetic healthcare. This could be due to the fact that most of the patients are running their own or family business and the fear of losing sales or returns makes the opportunity cost of taking time off for proper care high. Thus, reducing their chances of seeking professional care. Moreover, the study found out that relatively, the percentage of unemployed diabetic patients who sought professional medical care were more than the employed who sought professional medical care, See appendix table 1. This however, corroborate with the findings of Karinja et al. (2019), who reported that patients working in farms and running family businesses had irregular visits to clinics due to the fear of losing daily wages/income. Also aside those running their own or family business, most of the remaining are unemployed, which makes them unable to afford professional healthcare due to low income.

Also, as expected but not statistically significant, patients who have insurance cover are more likely to seek professional healthcare since the insurance may cover part of the treatment costs. However, the general difficulty in assessing insurance package or the many requirements needed before insurance funds are disbursed in times of need may contribute to the fact that they are not significant. Again, most of the patients are employed in the informal sector where insurance is

optional. Or given that greater percentage of them are not highly educated and may not understand the need for insurance, may contribute to it not being significant.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 Introduction

This chapter summarizes the findings, presents the conclusion and the recommendations based on the findings of the study.

5.2 Summary

The study set out to assess the health seeking behavior of diabetic patients in Kenya. Specifically, the study sought to identify the factors associated with the health seeking choices of diabetic patients. The study used probit model due to binary nature of the dependent variable and data from the Kenya Integrated Household Budget Survey, 2015-2016. After carrying out the relevant diagnostic tests, the study did not find independent variables highly correlated (problem of multicollinearity), but heteroscedasticity was present, and was corrected using robust standard errors.

After the analysis, the study found out that completing secondary and above level of education, salary, being diagnosed by a health worker, and being employed significantly influences the decision to seek professional care or the health seeking behavior of diabetics. Being diagnosed by a health worker was found to have the strongest positive relationship with seeking professional healthcare. Cost of treatment, age of the patient, sex of the patient, not married and being employed reduces the likelihood of a diabetic patients seeking professional healthcare. On the contrary, salary, when diagnosed by health worker, ageing females, completing secondary school and above, and having insurance cover were found to increase the likelihood of a diabetic patients seeking professional care.

5.3 Conclusion

The study concludes that in Kenya, the factors that influence the health seeking behavior of diabetic patients are education, salary or earnings, type of consultant who diagnosed the disease and the employment status of the patients. The factor which has the greatest influence is the type of consultant who diagnosed the disease.

5.3 Recommendation

The study therefore recommends that frequent community sensitization and awareness program on diabetes such as free medical camps be held with much focus on individuals running their own or family businesses and the unemployed. This should come with health workers who can screen/treat freely the diabetic patients as done for other diseases such as HIV/AIDS. The study also noted that the number of patients with insurance cover is low and that would expose diabetic patients to catastrophic spending or failure to access care to avoid debt due to the chronic nature of diabetes disease. The study recommends policies which would help to incorporate diabetes screening and treatment in all out-patients' health services in the country.

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APPENDIX

Employment Status and Health seeking behavior (professional healthcare)

Sought professional healthcare	Employment status		
	0	1	Total
0	21	41	62
%	31.34	34.17	33.16
1	46	79	125
%	68.66	65.83	66.84
Total	67	120	187

Correlation Matrix

Independent Variable	Cost of treatment (Ksh)	Salary (Ksh)	Diagnosed by health worker (yes=1)	Age of the patient (years)	Sex of the patient (female=1)	Never married	Completed secondary school and above	Employment Status (employed=1)	Patient has insurance cover (yes=1)
Cost of treatment (Ksh)	1								
Salary (Ksh)	-0.011	1							
Diagnosed by health worker (yes=1)	0.067	0.0087	1						
Age of the patient (years)	-0.0516	-0.0888	0.0123	1					
Sex of the patient (female=1)	-0.0288	-0.1682	-0.0083	-0.0746	1				
Never married	-0.0419	-0.1161	-0.0503	-0.033	0.3123	1			
Completed secondary school and above	0.059	0.2814	0.0136	-0.1923	-0.2311	-0.1175	1		
Employment Status (employed=1)	-0.0602	0.2403	0.0662	-0.085	0.0093	-0.1134	0.2246	1	
Patient has insurance cover (yes=1)	0.1947	0.2527	0.0709	0.0087	-0.0966	-0.2994	0.2948	0.241	1