KNOWLEDGE, PERCEPTION, ECONOMIC COST AND HEALTH SEEKING BEHAVIOUR RELATING TO DIABETES MELLITUS AMONG PATIENTS ATTENDING UNIVERSITY COLLEGE HOSPITAL, IBADAN, OYO STATE

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DEDICATION

To God for keeping me throughout the MPH programme and for giving me the grace and courage to execute this work successfully.

To my parents Mr. and Mrs. Adetunji and my brother, Doyin Adetunji for their love, care and support.

To the people suffering from any form of Diabetes Mellitus, may God in his infinite mercy continue to uphold them all.

ABSTRACT

Diabetes Mellitus (DM) is a serious disease condition that is prominent in all countries of the world including Nigeria. The rising prevalence of DM and the complications is a major public health concern. The knowledge, perception, cost and patients' health seeking behaviour have not been adequately studied among DM patients receiving care in tertiary hospitals. The study was therefore, designed to investigate knowledge, perception and cost of diabetes management among diabetes patients receiving care in University College Hospital (UCH), Ibadan.

The study was a descriptive cross-sectional survey which used a purposive sampling technique in selecting 207 consenting respondents in the Medical Outpatient Unit, UCH. A semi-structured interviewer-administered questionnaire was used to elicit information on respondents' socio-demographic characteristics, knowledge of DM, perception of DM, economic cost of DM and health seeking behaviour of respondents. Knowledge was assessed on a 36-point scale and scores ≤18, 19-24 and ≥25 were categorised as poor, average and good respectively. Health seeking behaviour was assessed on a 19-point scale and scores 0-10 and 11-19 were categorised as poor and good respectively. Data were analysed using descriptive statistics and inferential statistics at p=0.05.

More than half (56.0%) of the respondents were females. The age range of respondents was 38 to 87 years with a mean of 64.2±10.1 years. More (38.2%) respondents had tertiary education; the mean duration of managing DM among respondents was 7.7±6.6 years. Respondents' mean knowledge score was 25.0±4.8 and those with poor, average and good knowledge were 12.0%, 26.6% and 64.4% respectively. Majority (71.5%) perceived DM as a serious disease. The belief of 62.3% of the respondents was that drugs being prescribed for their treatment at the hospital were too expensive. Over half (53.1%) perceived that DM does not make one a burden in the family while 55.6% reported that DM management makes patients absent themselves from work occasionally. Direct cost of managing DM included the spending of ₦101 to ₦500 on transport to the hospital per week (79.5%). Majority (76.3%) spent ₦1,250 on consultation per clinic. The overall

mean direct cost was ₦7577.7±4071.8 while overall direct median cost was ₦6950.0. Indirect cost of DM included the challenge of being accompanied to the clinic by someone (24.6%). Less than half (48.8%) spent between 120-240 minutes in the hospital for care. Majority (87.4%) of respondents had good health seeking behaviour. The mean health seeking behaviour score of respondents was 13.7±2.8. Inferential statistics showed that there was a statistically significant difference between the means of direct cost reported for the two health seeking behaviour categories ($P<0.05$).

Respondents' knowledge about DM was generally good and most showed favourable perception towards the disease. However, many were not clear about the social burden of diabetes and effects of the disease on their productivity. Economic cost measures in this study reflected the expensive nature of the DM, yet respondents had good health seeking behaviour. Health promotion strategies such as social support, advocacy and training are needed to decrease out of pocket expenditure and waiting time in hospitals.

Keywords: Diabetes mellitus, Direct cost, Indirect cost, Health-seeking behaviour

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Adetayo ADETUNJI

CERTIFICATION

I hereby certify that this research work was carried out by Adetayo ADETUNJI in the Department of Health Promotion & Education, Faculty of Public Health, College of Medicine, University of Ibadan.

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LIST OF ACRONYMS

Abbreviation

ADA:	American Diabetes Association
CDA:	Canadian Diabetes Association
DAN:	Diabetes Association of Nigeria
DM:	Diabetes Mellitus
GDM:	Gestational Diabetes
HBP:	High Blood Pressure
IDF:	International Diabetes Federation
IFG:	Impaired Fasting Glucose
IGT:	Impaired Glucose Tolerance
KS:	Knowledge Score
NCDs:	Non-communicable Diseases
T1DM:	Type 1 Diabetes Mellitus
T2DM:	Type 2 Diabetes Mellitus
UCH:	University College Hospital
WHO:	World Health Organisation

CHAPTER ONE

INTRODUCTION

1.1 Background to the study

Diabetes Mellitus (DM) is a chronic and progressive disease (Oguejiofor, Odenigbo and Onwukwe, 2014) which is typically characterised by high levels of blood sugar in the system. The disease is further characterized by imbalance of fat and protein metabolism (Okolie, Ehiemere, Ezenduka, and Ogbu, 2010; Oladapo, Jude-Ojei, Koleosho and Roland-Ayodele, 2013). Changes in the human environment, behaviour, and lifestyle have resulted in dramatic increase in the incidence and prevalence of diabetes in people with genetic susceptibility to diabetes. (Olamoyegun, Ogunmola, Oladosu and Kolawole, 2013). In developing countries (such as Nigeria), people aged 40 to 60 years (which constitute the core of the working force) are affected most, compared with those older than 60 years in developed countries like United States of America (Shaw, Sicree, and Zimmet, 2010). There are three main types of diabetes; these are type 1 diabetes, type 2 diabetes and gestational diabetes which develops during preganancy (CDA, 2013; National Institute of Diabetes and Digestive and Kidney Diseases, 2014).

Type 1 Diabetes Mellitus (T1DM) occurs when the body cannot secrete enough of the insulin hormone or cannot use insulin effectively. This form of DM occurs as a result of an auto-immune process with very sudden onset. People living with this form of DM need insulin therapy to survive (Obasi and Agba, 2014). The Type 2 Diabetes Mellitus (T2DM) is the form of DM which majorly comprises of a range of dysfunctions; these dysfunctions are characterized by hyperglycaemia resulting from the combination of resistance to insulin action, inadequate insulin secretion, and excessive or inappropriate glucagon secretion (Okuonghae, Makinde, Umhenin and Erah 2014). The T2DM results from interaction between genetic, environmental and behavioural risk factors (Chen, Magliano and Zimmet, 2011).

Gestational Diabetes Mellitus (GDM) has been defined as any degree of glucose intolerance with onset or first recognition during pregnancy (Obasi and Agba, 2014). It is normally characterised by hyperglycaemia diagnosed during pregnancy without a previous known history of diabetes. The condition is a potential risk to the pregnancy in that it can lead to congenital malformations, increased birth weight and sometimes perinatal mortality (Cheung and Wong 2011; WHO, 2015).

Diabetes treatment aims to keep the level of blood glucose within recommended targets. Allowing blood glucose to remain higher increases the risk of developing serious long-term complications. Treatment must be monitored and adjusted regularly to ensure that the recommended blood glucose levels are achieved. Globally, as at 2010, an estimated 285 million people had diabetes, with type 2 making up about 90% of the cases (Akinjinmi, Adeyooye, Akingbade and Okerentugba, 2014). Over 3.7 million Nigerians are suffering from one form of the disease or the other (IDF, 2013). There is evidence that prevalence of non-communicable diseases is increasing, including diabetes mellitus, which if not adequately managed, can result in a wide range of complications that have clinical, social and economic implications, especially due to decreasing age of onset (Giwa and Tayo, 2014).

Type 2 diabetes accounts for 85% to 95% of all diabetes in high-income countries and may account for an even higher percentage in low- and middle-income countries (IDF, 2013). Diabetes is associated with many long-term complications including retinopathy, nephropathy and neuropathy. They are also prone to macrovascular complications, coronary artery disease, stroke and peripheral vascular disease (Olamoyegun, Ogunmola, Oladosu and Kolawole, 2013). Due to the chronic nature of diabetes especially with severe complications, this disease needs prolonged costly therapy and care (Boutayeb, Boutayeb, Lamlili and Boutayeb, 2013).

Diagnosis of DM includes one of the following fasting plasma glucose ≥ 126 mg/dl, symptoms of hyperglycaemia and casual plasma glucose ≥ 200 mg/dl, two-hour glucose ≥ 200 mg/dl during oral glucose tolerance test. A single $HbA1_c$ test could be used for both diagnosing and monitoring diabetes. It is also recommended that the test be done 3-4 times a year for type 1 or poorly controlled type 2 diabetic patients and two times per year for well controlled type 2 diabetic patients (American Diabetes Association, 2010).

Diabetes is regarded as a costly disease and the high cost is as a result of the treatment of the disease itself, complications of the disease and treatment of other associated diseases where diabetes is a fundamental factor (Buowari, 2013). The burden of Type 2 diabetes is excessively endured by people of working age. This means people of this age have their economic productivity reduced and it has a major impact financially on both household and national economies (Oguejiofor, Odenigbo and Onwukwe, 2014). Approximately 50% of patients with GDM will develop type 2 diabetes five to ten years postpartum (Adeniyi, 2012).

The types of cost associated with diabetes are same for any other disease in that the cost of the disease can be divided into direct and indirect cost. Direct costs include the cost of drugs, diagnostic/monitoring tests, transportation and personnel (Giwa and Tayo 2014). The indirect costs of diabetes are majorly the costs of lost productivity as a result of time off work due to sickness or attendance for care, inability to work because of disability (e.g. impairment of vision, leg ulcer etc.), premature retirement because of disability, premature mortality because of the acute or chronic complications of diabetes; Time off work taken by significant others of people with diabetes also constitute indirect cost (Yesudian, Grepstad, Visintin and Ferrario, 2014).

It has been noted that a person with DM incurs medical costs that are two to five times higher than those of a person without diabetes (IDF, 2012). This situation is as a result of more frequent medical visits, purchase of supplies and medication and higher likelihood of being admitted to hospital (Olaitan, 2012). Improved understanding of the economic cost of diabetes and its major determinants helps to inform policymakers about the economic burden of the disease and to motivate the initiation of decisions to reduce diabetes prevalence and the associated burden (American Diabetes Association, 2012).

1.2 Statement of the problem

Diabetes mellitus (DM), is chronic and has no cure; it can, however, be effectively treated. (Ozougwu, Obimba, Belonwu and Unakalamba, 2013). The condition leads to other complications such as cardiovascular diseases, blindness and foot problems (Ogbera and

Ekpebegh, 2014). It has been reported that the prevalence of the disease is on the increase and it is slowly tending towards a pandemic (Oshilonya, Ijioma and Ibeh, 2015).

Some 382 million people worldwide, or 8.3% of adults, are estimated to have diabetes. It has been estimated also that 80% of them live in low and middle income countries. If these trends continue, by 2035, some 592 million people, or one adult in 10, will have diabetes (IDF, 2013).

In Africa, More than 21 million people have diabetes. It is estimated that 1 in 20 adults have diabetes – the lowest prevalence across regions. Africa has the highest percentage (62%) of undiagnosed people, who are at a higher risk of developing harmful and costly complications. In Nigeria, about 1 in 22 people are living with diabetes (IDF, 2013). Diabetes is a disease that leads to several co-morbid conditions and because of the associated complications, the cost of management could be a great burden to sufferers

Diabetic patients' knowledge and perception relating to the disease are crucial for the design of educational interventions aimed at promoting effective diabetic specific self-care practices among them. In addition, the awareness of the economic cost of the disease is needed for mapping out strategies for ameliorating the burden of the disease on sufferers. The cost of managing diabetes and its associated complications could have a substantial effect on the way diabetic patients manage their health.

However, knowledge, perception and economic cost of diabetes management (direct and indirect cost) from the perspective of the patients attending tertiary hospitals such as the University College Hospital, Ibadan has not been fully investigated. This study was designed to determine the knowledge, perception, economic cost and health seeking behaviour of diabetic patients receiving care at the University College Hospital (UCH), Ibadan.

1.3 Justification

The prevalence of DM keeps increasing and the figures projected for the African region and Nigeria are alarming. The different problems that are associated with DM affect patients' physical, psychological and social health. To this end, there is need to contribute to the body of knowledge of the disease. The findings from this study could therefore be potentially

useful for designing programmes aimed at ameliorating the burden of the disease among patients. The results also have potential for guiding the formulation of policies aimed at addressing the peculiar economic and educational needs of candidates of diabetes receiving care in a typical teaching hospital. Teaching hospitals are unique because they are centres for health care and research.

1.4 Research Questions

The research questions formulated to guide the study are as follows:

1. What is the level of knowledge on diabetes mellitus among respondents?
2. What are respondents' perceptions of diabetes mellitus?
3. What are the direct and indirect costs of diabetes mellitus among respondents?
4. What is the health seeking behaviour of respondents?

1.5 Broad objective

The broad objective of this study was to investigate the knowledge, perception, economic cost and health seeking behaviour relating to diabetes mellitus among diabetes patients receiving care at the UCH, a tertiary health care facility.

1.6 Specific objectives

The specific objectives were to:

1. Assess the level of knowledge of respondents' on diabetes mellitus
2. Determine respondents' perception of diabetes mellitus
3. Assess the direct and indirect costs of diabetes mellitus among respondents
4. Identify the health seeking behaviour of respondents receiving care at the UCH, Ibadan.

CHAPTER TWO

LITERATURE REVIEW

2.1 Overview of the nature of diabetes

Diabetes is a group of metabolic disorders characterized by a chronic hyperglycaemic condition resulting from defects in insulin secretion, insulin action or both (Ozougwu, Obimba, Belonwu, and Unakalamba, 2013). The effects of diabetes mellitus include long-term damage, dysfunction, and failure of various organs (WHO, 2014). Diabetes is a well-recognized cause of premature death and disability, increased risk of cardiovascular disease, kidney failure, blindness and lower-limb amputation (WHO, 2014). The disease is one of the leading contributors to the Non-Communicable Diseases (NCDs) burden in the world and together with other NCDs, they constitute the major cause of deaths accounting for 60% of all mortality globally (Healthy Caribbean Coalition (HCC) NCD Alliance, 2011). Diabetes mellitus is one of the most common chronic diseases in nearly all countries, and continues to increase in numbers and significance, as changing lifestyles lead to reduced physical activity, and increased obesity (Shaw, Sicree, and Zimmet, 2010). There are three major types of diabetes; these are type 1, type 2 and gestational diabetes (CDA, 2013; Abdullahi, 2014).

Type 1 Diabetes Mellitus (DM) occurs when the pancreas fails to produce enough insulin. The major characteristic of this type of DM is that there is loss of the insulin-producing beta cells of the islets of Langerhans in the pancreas which then leads to insulin deficiency (Van Belle, Coppieters and Von Herrath, 2011). This type of diabetes can be further classified as immune-mediated or idiopathic. The majority of type 1 diabetes is of the immune mediated nature, where beta cell loss is a cell mediated autoimmune attack (Mwangi and Gitonga, 2014). Type 1 diabetes is one of the most frequent chronic diseases experienced by children and it globally represents a public health challenge (Majaliwa, Elusiyan, Adesiyun, Laigong, Adeniran, Kandi, Yarhere, Limbe and Iughetti, 2008). Many cases of type 1 diabetes may die of acute complications; it could be misdiagnosed, or may not present to hospital due to poverty and lack of health insurance (Oputa and Chinenye, 2015).

Type 2 DM, on the other hand, begins with insulin resistance which is a condition in which cells fail to respond to insulin properly (Ezuruike and Prieto, 2014). As the disease progresses a lack of insulin may also develop. It was on this basis that this form was previously referred to as "non-insulin-dependent diabetes mellitus" (NIDDM). More than 95% of cases of diabetes in Nigeria are type 2 diabetes (Oputa and Chinenye, 2015). Type 2 DM is a disorder caused by a combination of genetic factors related to impaired insulin secretion, insulin resistance and lifestyle related factors such as obesity, over eating, lack of exercise, and stress as well as aging (Kaku, 2010). The increase in prevalence of type 2 diabetes is inseparably linked to the adoption of lifestyle of western cultures which is characterised by high diet with reduced physical activity. This leads also to risk factors of diabetes like obesity (Colagiuri, 2010). People with this disease often become obese because they over eat due to the cell's resistance to insulin. (Adebisi, 2013). The commonest age at diagnosis was in the fifth decade or from fifty years (Edo, Edo, Ohenhen, Ekhator and Ordiah, 2015).

Gestational Diabetes Mellitus (GDM) occurs when pregnant women without a previous history of diabetes develop a high blood sugar level. GDM tends to occur around the 24th week of pregnancy. The condition arises because the action of insulin is blocked, probably by hormones produced by the placenta. (IDF, 2013). It has also been documented that in most cases of GDM sufferers do not show the typical symptoms of DM. Glucose intolerance in this form of DM is of variable degree (Chukwunyere, Awonuga and Igwe, 2015). The condition of GDM has been associated with an increased risk of obesity and abnormal glucose tolerance during childhood and adult life in the offspring (Oputa and Nzeribe, 2013).

The primary treatment options for GDM are diet and exercise. Drug treatment becomes additionally useful in many cases due to the failure of the primary options to provide adequate glycaemic control (Perkins, Dunn and Jagasia, 2007). Gestational diabetes mellitus can lead to serious health risks to the mother and her infant and increase the risk for developing type 2 diabetes later in life (IDF, 2013). The basic management method for women with GDM is nutritional therapy. Some women with GDM require diet therapy alone, while some women require both diet therapy and insulin therapy (Sugiyama, 2011).

In a study conducted by Muhammad, Prasanth, Dilip, Danisha, Zainul and Seena (2010), in India, the prevalence of diabetes was attributed to the food habits, reduced physical activity and family history. Sex and age were also relevant factors. It is observed that male subjects are more susceptible for type 2 diabetes mellitus. Type 2 diabetes has been reported to be predominantly more prevalent in ageing populations (IDF, 2013).

Diabetes is associated with several risk and/or causative factors such as obesity, hypertension, dyslipidaemia, poor diet, physical inactivity, and lack of regular exercise. Other risk factors such as increasing age, family history of diabetes, history of impaired glucose tolerance (IGT) and impaired fasting glucose, history of GDM, and large babies and ethnicity could be anticipated and taken care of by regular screening, national guide lines, the expansion of health insurance, and regular national surveys (Oputa and Chinenye, 2012). Other factors are cigarette smoking and generous consumption of alcohol. Obesity has been found to contribute to approximately 55% of cases of type 2 DM (Olokoba, Obateru and Olokoba, 2012). A study conducted in Uganda has linked DM with hypertension, obesity and being overweight (Maher, Waswa, Baisley, Karabarinde, Unwin and Grosskurth, 2011).

Diabetes mellitus may present with characteristic symptoms such as thirst, excessive hunger also known as polyphagia, blurring of vision, weight loss (ADA, 2010). In a retrospective study conducted by Adogu, Chineke, Ewuzie, Enwere and Egenti (2015), the commonest symptom at presentation was polyuria which involves excessive or abnormally large production or passage of urine (which is greater than 2.5 or 3 Litres over 24 hours in adults), followed closely by polydipsia which means excessive thirst, while the least presenting symptoms include vaginal discharge and erectile dysfunction.

2.2 Prevalence of diabetes

2.2.1 Prevalence of diabetes worldwide

Three hundred and eighty two million people have diabetes. The figure is expected to rise to 592 million by 2035 (IDF, 2013). It has also been noted by the IDF (2013) that the greatest proportion of people with diabetes are between 40 and 59 years of age.

Globally, diabetes prevalence is increasing and is responsible for 5% of all deaths annually (WHO, 2011). Diabetes was directly responsible for 1.5 million deaths in 2012 and 89

million Disability-Adjusted Life Years. The global prevalence of diabetes was estimated to be 9% in 2014. The prevalence of diabetes was highest in the WHO Region of the Eastern Mediterranean Region which was 14% for both sexes and lowest in the European and Western Pacific Regions which was 8% and 9% for male and female, respectively (WHO, 2014). A 2011 Centre for Disease Control and Prevention report estimates that DM affects about 25.8 million people in the US (7.8% of the population) in 2010 with 90% to 95% of them being type 2 DM.

In a recent study conducted among Muslim populations in India, the overall prevalence of DM was found to be 16.63%. About 13.8% individuals had shown co-prevalence of diabetes mellitus and hypertension. Additionally, the association of diabetes mellitus with different risk factors such as consumption of alcohol and difference in physical activities were found to be statistically significant (Shah and Afzal, 2013). Ekpenyong, Akpan, Ibu and Nyebuk, (2012) reported that China currently has the highest number of people living with diabetes which is about 90.0 Million and this figure is expected to jump to about 129.7 million by 2030. In a recently conducted study in china, the age- and gender-standardized prevalence of diabetes was 8.21% in urban areas, while In rural areas, the age- and gender-standardized prevalence of diabetes was 6.08% (Gong, Pa, Wang, Mu, Dong, Ya, Xu, Tao, Pan, Wang and Shan, 2015).

2.2.2 Prevalence of Diabetes in Africa with special reference to Nigeria

Africa has the highest percentage (62%) of undiagnosed people, who are at a higher risk of developing harmful and costly complications (IDF, 2013). IDF (2013) have also reported that the African prevalence was 5.1% and a comparative prevalence of 5.9% which is calculated by assuming that a country/region has an age profile identical to that of the world population. Oguntola (2011), opined that the African region experience the incidence rate of DM at 3.8 per cent a total of 13.1 million people. In Tanzania, findings of a study showed very high prevalence of diabetes and this was found especially in individuals aged 40-60 years (Ruhembe, Mosha and Nyaruhucha, 2014). In a population study conducted in rural and urban areas of Senegal by Seck, Dia, Doupa, Diop-Dia, Thiam, Ndong and Gueye, (2012,) The crude prevalence of DM was reported to be 10.8% and the age-adjusted prevalence was

7.6% Seck et al (2012) also stated that The crude prevalence of diabetes in urban and rural settings was, respectively, 12.7% and 6.8%.

The prevalence and incidence of diabetes vary across culture and ethnic groups in Nigeria. However, there is dearth of data on specific cultures or groups in the country (Adejoh, 2012). The crude prevalence of DM in a national survey conducted in 1992 among males and females below the age of 45 years was 1.6% and 1.9%, respectively. There was a 3-fold increase when 45 years above were considered which translated to 5.4% and 5.6% among males and females, respectively. Urban communities had a higher overall prevalence of diabetes (3.3%) when compared with rural communities (2.6%) (Akinkugbe, 1997 as cited by Akinjinmi, Adeyooye, Akingbade and Okerentugba, 2014). Isolated reports from some regions of Nigeria have found prevalence rates to range from 0.9-8.3% (Adibe, Aguwa, Ukwe, Okonta and Udeogaranya, 2009). Chijioke, Adamu and Makusidi (2010), reported that the percentage of those living with type 2 diabetes in Nigeria was 5.12% which translated to approximately 8.19 million. In Lagos state, south west Nigeria, the prevalence was found to be between 3.2 to 5.4% in a state-wide screening of 439, 035 patients by Lagos State Ministry of Health from 2007 to 2010 (Lagos State Ministry of Health, 2014). In Abeokuta, male subjects had higher prevalence of diabetes (1.85%) than females with 1.19% prevalence while persons aged 48 - 57years had the highest prevalent rate (21.1%) (Akinjinmi et al, 2014).

In a study conducted in south eastern Nigeria, the overall prevalence of type 2 diabetes mellitus was found to be 10.5%; the diagnosed and undiagnosed represented 9.7% and 0.8% respectively. The male and female prevalence rates were 9.6% and 11.2%, respectively. The age and sex specific prevalence rates were 2.74%, 8.50%, 16.54% and 23.70% in males aged 18-25, 26-35, 36-45 and 46-60 years, respectively. In females of the same age groups (18-25, 26-35, 36-45 and 46-60 years), the prevalence was reported as 3.95%, 9.70%, 13.01% and 29.39%, respectively (Ekpenyong et al, 2012).

Incidence of diabetes mellitus among pregnant women in Nigeria has been found to be 1.7% with pre-gestational diabetes making up 39% of cases and gestational diabetes making up the remaining 61%. (Diabetes Association of Nigeria, 2013). In a more recent study, it was found that the prevalence increased with maternal age; 3.3% in the age group of 15 to 24 years,

4.2% in those aged 25 to 34 years while it was 17.6% in the age group of 34 to 44 years and an average prevalence of 4.2% (Ewenighi, Nwanjo, Dimkpa, Onyeanusi, Nnatuanya and Onoh, 2013).

The prevalence of risk factors for type 2 diabetes mellitus has been reported to be as high as 2.4% among adolescents in Port Harcourt (Jaja and Yarhere, 2015). Kyari, Tafida, Sivasubramaniam, Murthy, Peto and Gilbert (2014), recently reported age-adjusted prevalence of diabetes in Nigeria as 3.25%. Based on previous studies done in Nigeria, it has been suggested that based on gender, females might have the highest prevalence of the disease. In a study conducted in eastern Nigeria, it was found that there was high incidence case of diabetes mellitus and the rate was more in females than in males (Chukwu, Ezebuiro, Samuel, Nwachukwu, 2013).

2.3 Complications and management of diabetes

2.3.1 Complications of diabetes

Diabetes Mellitus increases risk for developing several complications (Deshpande, Harris-Hayes and Schootman, 2008). Diabetes complications can affect various parts of the body such as the eyes, kidney, limbs and the heart (Goren and Fen, 2008). The disease is one of one of the most serious in Nigeria with hyperglycemic emergencies and Diabetic Foot Ulceration (DFU) being the commonest indications for admission in tertiary hospitals in the country. Diabetic foot ulceration is a major reason for prolonged hospital stay, morbidity and mortality (Oguejiofor, Odenigbo and Onwukwe, 2014).

Colagiuri, Kent, Kainu, Sutherland and Vuik (2015) has reported that diabetes doubles the risk of coronary heart disease in men, and quadruples it among women. Colagiuri et al (2015) went on to state that stroke in people with DM is three times higher than in people without diabetes. DM is the leading cause of end stage renal disease (Lutale, Thordarson, Abbas and Vetvik 2007). As a result of these complications, type 2 diabetes can reduce a person's life expectancy by up to 10 years (Diabetes UK, 2015). To buttress this point there were around 5 million deaths worldwide in 2014 as a result of diabetes and its related diseases. Nearly half of these deaths were of people under the age of 60 (IDF, 2013). Type 2 Diabetes mellitus could be associated with cognitive impairment. (Eze, Ezeokpo, Kalu and Onwuekwe, 2015).

Diabetic patients have a greater vulnerability to cardiovascular disease risk factors especially dyslipidaemias than the non-diabetic individuals (Okeahialam, Alonge, Pam and Puepet, 2011).

Some complications of DM which are common in Nigeria are neuropathy, erectile dysfunction, nephropathy and retinopathy (Ofoegbu and Chinenye, 2013). These are common because diabetes is a progressive condition with an early stage where patients are asymptomatic and this stage is associated with on-going tissue damage and decline in pancreatic beta cell mass and function (Oputa and Chinenye, 2015). Diabetic eye complications have been identified as a huge public health problem (Abraham and Umoh, 2013). The World Health Organisation, (2012) stated that 1% of global blindness can be traced to diabetes.

Long duration of diabetes mellitus and peripheral neuropathy are risk factors for foot complication in Nigerians with diabetes mellitus (Oguejiofor, Odenigbo and Oguejiofor, 2010.). People living with DM are at more than 25 times greater risk of limb amputation than those without diabetes (Colagiuri, Kent, Kainu, Sutherland and Vuik 2015). Diabetic neuropathy, is the most common complication of diabetes and the symptoms could include numbness, tingling, pain, and altered pain sensation, which can lead to damage to the skin. (WHO, 2014). Complications left unchecked leads to mortality; identified factors that contribute to high mortality due to diabetes in Nigeria are ignorance, poor hygiene, infections, lack of foot care and inadequate glycaemic/blood pressure control (Chijioke, Adamu and Makusidi, 2010). People with diabetes have a significantly higher risk of foot ulceration, making foot complications one of the most frequent reasons for hospitalization (Kibachio, Omolo, Muriuki, Juma, Karugu, and Ng'ang'a, 2013).

In a multi-centre study conducted across seven tertiary health centers in Nigeria, among diabetic out-patients, diabetic complications found were peripheral neuropathy (59.2%), retinopathy (35.5%), cataracts (25.2%), cerebrovascular disease (4.7%), diabetic foot ulcers (16.0%), and nephropathy (3.2%) (Chinenye, Uloko, Ogbera, Ofoegbu, Fasanmade, Fasanmade and Ogbu, 2012). The presence of hypertension in diabetic patients substantially

increases the risks of coronary heart disease, stroke, nephropathy and retinopathy (Shal and Afzal, 2013).

The Centre for Disease Control and Prevention (2013), reports DM as a major cause of heart disease and stroke and the seventh leading cause of death in the United States. It has been documented that ventilatory function has a relationship with the diabetic disease. Ozoh, Okubabejo, Bandele, and Chukwu (2010), have noted that ventilator function was significantly reduced in diabetes subjects compared with controls without diabetics.

2.3.2 Management of diabetes mellitus

Diabetes Mellitus (DM) is a disease that can be prevented through lifestyle modification, diet control, and control of overweight and obesity (Olokoba, Obateru and Olokoba, 2012). In controlling the incidence and prevalence of diabetes, treatment of Diabetes in Nigeria has always included the use of insulin and oral hypoglycaemic agents in conjunction with dietary and life style modification (Ogbera and Ekpebegh, 2014). The goal of treatment in type 2 diabetes is to achieve and maintain optimal blood glucose, lipid, and blood pressure levels to prevent or delay chronic complications of diabetes (American Diabetes Association, 2010; Litwak, Goh, Hussein, Malek, Prusty and Khamseh, 2013).

Generally, Diabetes Self-Management Education (DSME) is crucial to the management of any form of diabetes (Nwankwo, Ezenwaka, Onuoha and Agbakoba, 2015). This concept helps in describing the nature of the disease, potential complications and it helps in correcting several misconceptions about the disease. Components of DSME are foot care (which practically entails daily inspection of the feet, wearing comfortable shoes, and avoidance of bare feet working), self-monitoring of blood glucose with the aid of a glucometer and dietary management (American Diabetes Association, 2015). Dietary management is a key method in the attainment of good blood glucose control in diabetes mellitus. Dietary management of the condition is also key to the management of the disease. This is targeted at improving the overall health by achieving and maintaining optimal nutritional status (Oladapo, Jude-Ojei, Koleosho and Roland-Ayodele, 2013). Good glycaemic control and prevention of acute and long term complications of diabetes (Ogbera and Ekpebegh, 2014). Diabetes self-management education is advised because of the nature

of the disease in that only patients and their families can absolutely monitor the fluctuations of the body system. Knowledge of self-care is the key to achieving good management of the disease (Adibe, Aguwa, Ukwe, Okonta, Jegberime and Udeogaranya, 2009).

Clinical management include Insulin therapy (which is normally through pump or injection) and use of oral agents (Diabetic Association of Nigeria, 2013). For some diabetics, insulin produced by their pancreas is not properly utilized by target cells in the body (ADA, 2007). For such patients, there is one class of medicine that makes the body more sensitive to insulin, such as metformin (Natali and Ferrannini 2006 as cited by Ernest and Mpondo, 2015). The second class of diabetes medication belongs to those drugs that stimulate beta cells to produce more insulin. Such drugs are Amaryl, Diabeta, Glucotrol, Micronase and Glynase. The third class of diabetes medication that helps slows the breakdown of sugar and starches in the body such as Miglitol and Acarbose (Nwaokoro, Okorie, Oputa, Emerole, Nwawume and Nwufo, 2014). Some other Drugs that are currently employed in the management of diabetes mellitus in Nigeria include Biguanides (e.g. Metformin), Sulphonylureas (e.g. Chlorpropamide, gliclazide), Alpha-Glucosidase inhibitors (e.g. Acarbose), DPP-4 inhibitors and parenteral glucose lowering agents (Dia betic Association of Nigeria, 2013; Ogbera and Ekpebegh, 2014). Another clinical way of monitoring and managing the level of blood sugar in respect to diabetes is the Hemoglobin (HbA1c) test. It is a reliable method of having a window retrospectively of how glycemic control has been in recent weeks (Adebayo, 2015).

WHO targets to help prevent type 2 diabetes and its complications are as follows; achieve and maintain healthy body weight, be physically active - at least 30 minutes of regular, moderate-intensity activity on most days, early diagnosis can be accomplished through relatively inexpensive blood testing, treatment of diabetes involves lowering blood sugar and the levels of other known risk factors that damage blood vessels and tobacco cessation is also important to avoid complications. (WHO, 2008).

2.4 Knowledge, beliefs, perceptions and attitudes relating to diabetes mellitus

2.4.1 Knowledge relating to diabetes mellitus

Patients' knowledge about DM and appropriate timely management with respect to the condition are important factors for limiting the complications of the disease (Phillips, Mashigeb and Clarke-Farr, 2011). The lack of knowledge of diabetic patients about the

disease will influence their practices which can lead to systemic and ocular complications **(**Maina, Ndengwa, Njenga and Mucheni, 2011). Adequate knowledge of DM empowers the community about good health seeking behavior, drug compliance and follow up care (Alele and Ilesanmi, 2014).

A study conducted by Achigbu, Oputa, Achigbu, and Ahuche (2015), in a tertiary hospital in Nigeria showed that diabetic patients had good knowledge of the oral agents used in management of their ailment. Educational background might not really have an effect on the knowledge of diabetes, this fact was buttressed through the study conducted by Odenigbo and Inya-Osuu (2012), in Abia state. Odenigbo and Inya-Osuu (2012) reported that people with DM in an urban area of Abia state, Nigeria had poor knowledge of diabetes and its dietary management. Findings of a study among diabetic patients in Egypt showed that 52.3% participants had adequate knowledge regarding diabetes. Furthermore, it was reported that the significant predictors of good knowledge were urban residence, duration of the disease, work and positive family history (El-Khawaga and Abdel-Wahab, 2015).
There have been cases where diabetic patients have been documented to have high knowledge about the disease. For instance, a study in Ethiopia showed that knowledge of patients was high especially on lifestyle modifications brought about by the disease (Abdulkadir, Esayas, Belayneh, Mustefa, Muluneh and Thirumurugan, 2014.). A similar study among patients in Northern Nigeria showed relatively good knowledge on diabetes (Hamoud, Al Ayoubi, Vanama, Yahaya and Usman, 2012).

Factors such as cultural beliefs have also contributed to poor knowledge of diabetics in some cases (Jasper, Ogundunmade, Opara, Akinrolie, Pyiki and Umar, 2014). Studies on diabetes conducted in other African countries such as South Africa showed that knowledge of diabetes including how it could lead to complications was generally poor among patients (Phillips et al. 2011). Alele and Ilesanmi (2014), in their work in southern Nigeria found out that the knowledge of symptoms of diabetes was low. Odili, Isiboge and Eregie (2011), in a study conducted among DM patients in University of Benin Teaching Hospital, Edo state, showed that respondents' knowledge of DM was very poor. Odili et al reported that there were gaps in knowledge on items such as blood glucose monitoring with glycosylated

haemoglobin test and there was a general misconception about the disease. The investigators also noted that duration of diabetes influenced the level of knowledge among patients in that patients who had experienced DM for a longer time had higher knowledge score.

2.4.2 Beliefs, perceptions attitudes relating to diabetes mellitus

In a study conducted by Adejoh (2012) among the Igala in Nigeria, people living with diabetes who had good perception of the disease had better management status compared with those with poor sense of perception. Findings from another study among students in a tertiary institution, in Nigeria showed that negative perception of the disease was obvious among some of the respondents in the area of complications of the disease and symptoms. Futhermore, negative perception about physical inactivity as a risk factor for diabetes was more common among female respondents (Okuonghae, Makinde, Umhenin and Erah, 2014). In a study conducted in Rwanda, participants' perceived type 2 diabetes as a chronic condition associated with serious but controllable consquences (Nsereko, Bavuma, Tuyizere, Ufashingabire, Rwakageyo and Yamuragiye, 2013). Nsereko et al further showed that participants who had good beliefs on Illness identity, timeline, and personal control seem to be actively involved in self-care activities. However, those who held beliefs in diabetes time variability had low motivation to perform self-care activities. This buttresses the point that belief of individuals is very key to their health seeking behaviour and the subsequent control of the disease. In a study conducted in South Africa, respondents believed that the consequences of increased blood sugar levels are significant enough to cause complications and they should be avoided (Mshunqane, Stewart and Rothberg, 2012). Findings from a study conducted in Hawaii among adults living with diabetes, revealed respondents' perceived barriers to disease management to include social prejudice, and lack of social support (Fukunaga, Uehara and Tom, 2011).

Alele and Ilesanmi (2014), reported that respondents showed good attitude towards the disease. Their study also goes on to state that there was a significant relationship with higher level of education and good attitude. Similarly, Al-Maskari, El-Sadig, Al-Kaabi, Afandi, Nagelkerke and Yeatts (2013), reported that respondents generally showed good attitude towards DM management but poor attitude towards having the disease.

2.5 Economic cost of diabetes and associated factors

2.5.1 Economic cost of diabetes

It has been documented diabetes cost the global economy about US$500 billion in 2010, and that figure is projected to rise to at least US$745 billion in 2030 with developing countries increasingly taking on a much greater share of the amount (Bloom, Cafiero, Jane-Llopis and Abrahams-Gessel, 2011). In 2014, the cost of direct healthcare for diabetes and its complications was around 11% of total healthcare costs worldwide. This is equivalent to $612 billion, which is greater than the entire GDP of countries such as Nigeria or Sweden. This cost is due both to the high prevalence of diabetes and to the fact that people with diabetes incur higher lifetime healthcare costs (Colagiuri, Kent, Kainu, Sutherland and Vuik, 2015).

According the IDF, an estimated amount of 4 billion USD was spent on diabetes health care in 2013. It is projected that this amount will increase by at least 58% by 2035. This is because the prevalence of diabetes in the continent is expected to be more than double the current figures (IDF, 2013). In comparison, people living in low- and middle-income countries like Nigeria and most African countries pay a larger share of health expenditure. This is because health insurance is non-existent or weak and there is lack of access generally to publicly available medical services (IDF, 2013; Kankeu, Saksena, Xu and Evans 2013).

The Annual National Cost of illness for diabetes mellitus in Nigeria, a developing economy may be about ₦226,152,196,630.00 ($1,521,014.644) which is about ₦225 billion annually while annual average cost of illness was determined to be ₦47, 924.95 ($319.50), representing 88% of annual per capita income. (Giwa and Tayo 2014). In a similar study conducted in 2014 where annual national direct cost of illness for type 2 patients was determined to be in the range of ₦262 billion (US$1 639 122 840.00), while that of type 1 is estimated to be ₦18 billion (US$112 537 001.25). The average direct cost of illness per patient with type 2 diabetes alone was ₦45 531.19 (US$284.57), while that of type 1 diabetes mellitus alone was ₦100 032.89 (US$625.21) (Suleiman and Festus, 2014).

Direct costs of diabetes include the cost of drugs, diagnostic/monitoring tests, transportation and personnel (Giwa and Tayo, 2014). Indirect costs of diabetes relate, primarily, to

absenteeism due to illness, early retirement due to diabetes, losses in productivity (which is also known as the cost of presenteeism) and dependence on social benefits. Additional elements of indirect cost relate to premature mortality and carer costs borne by family members (Kanavos, Aardweg and Schurer**,** 2012). American Diabetes Association, (2012), defined absenteeism as the number of workdays missed due to poor health which in this case is due to DM. A work conducted on productivity finds that people with diabetes have higher rates of absenteeism than the population without diabetes (Fu, Qiu, Radican and Wells, 2009).

2.5.1.1 High Cost of Diabetes Mellitus

Summation of the double costs of diabetes care entails costs of treatment and costs of disability which impedes the ability of the diabetic person to be economically viable and generate income to pay for treatment, makes diabetes management very expensive and a serious challenge to national economic development and health budgets (Oguejiofor, Odenigbo and Onwukwe, 2014). In a developing country like Nigeria, the economic burden of the disease is predominantly being borne from out-of-pocket expenses of people who may be living below the poverty line (Suleiman and Festusm, 2014).

It has been estimated that an Insulin requiring individual for any form of diabetes will spend at least 29% of his monthly income on Insulin (Ogbera and Ekpebegh, 2014). In a study carried out among diabetic patients at the Federal Medical Centre, Abeokuta, majority of patients (75%) were not able to do the test, principally due to cost issues as most of them have to pay out of pocket for their health needs, which include multiple medications and testing. In the absence of health insurance, this is financially burdensome (Adesina, Oduniyi, Olutunde Ogunlana, Ogunkoya, Alalade, Otubogun and Adesina, 2012).

It has been stated by Ogbera, Fasanmade, Ohwovoriole, and Adediran (2006) the mean costs for successfully treating a patient with Diabetic Mellitus Foot ulceration in Nigeria is 181581.0 Nigerian Naira (NGN), which approximately equivalent to 1200 US dollars , this amount is unaffordable by most hospital patients as about 60% of the population live below the poverty line. (As cited by Desalu, Salawu, Jimoh, Adekoya, Busari and Olokoba, 2011).

2.5.2 Factors contributing to cost of diabetes

Urban residence and increasing socioeconomic status are risk factors for new onset diabetes among elderly Nigerians. These social factors may be proxies for lifestyles that increase the likelihood of developing the disorder (Balogun and Gureje, 2013). A factor that might be contributing heavily to the cost of diabetes per patient could be poor knowledge of the disease among some categories of health care providers. They might not know the full aetiology of the disease and might not be able to correctly advise and provide care for diabetic patients.

In a study conducted among nurses by Odili and Eke (2010), indicated that the knowledge of the nurses sampled as regards diabetes mellitus was less than satisfactory; areas of knowledge deficits included dietary management and signs of acute complications of diabetes as well as proper foot care. Various studies on the part of the patients, socio-economic status have been highlighted as one of defining factors in health care. For example, in a study conducted in 2010, it was found that knowledge of complications of the disease such as eye problems, amputations, stroke, and kidney damage was poor among individuals with low education level (Amoo and Greene, 2010).

If patients are not getting enough income to manage their health, it might predispose them to complications which are far more difficult and expensive to manage; this was shown in a study carried out among DM patients in the south-eastern part of Nigeria in 2010. Income of study participants was very significant in their inability to procure diabetes supplies (like self-management materials such as strips, recommended diet), medications and appointment keeping (Nwankwo, Nandy and Nwankwo, 2010). Inadequate Health care delivery for diabetes management was also identified by Nwankwo et al. (2010), as one of major factors hindering lifelong management of the condition.

It has been shown that poor adherence to medication is common in type 2 diabetic patients, with adherence rates varying from 30% to 90%. This trend is likely to lead to an increased complication risk due to poor glycaemic control (Nwaokoro, Okokon, Nwaokoro, Emerole, Ibe, Onwuliri, Oputa and Chukwuocha, 2014). Non-refill of prescriptions due to relatively

high cost of medications remains the most important reason for medication non-adherence (Adisa and Fakeye, 2014).

Adherence to anti-diabetic drugs that might reduce the burden of complications is influenced by demographic, psychological, social factors, health care provider, medical system, disease and treatment related factors (Ujjinappa, Gowda, Kumaraswamy and Ujjinappa, 2013). In a study carried out in Kenya, marital status, level of education, monthly income, presence or absence of diabetes complication and age were the factors affecting diabetes self-managements practices (Berhe, Alemayehu Bayeray Kahsay and Gebru, 2013).

2.6 Health seeking behaviour of diabetes patients

Health seeking behaviour are set of actions taken to protect, promote and maintain the health of an individual (Olasunbo and Ayo, 2013). Agofure, Oyewole, and Okandeji-Barry (2015), also stated that health seeking behavior are *'all voluntary actions and activities embarked upon by an individual to prevent, detect, treat or manage diseases at any stage either asymptomatic or symptomatic.'*

In a study conducted by Ma'aji, Kola-Olaniyan and Abdullahi (2014), patient's adherence with most of the diabetic regimen was found to be low. The patient-physician relationship was found to be poor. The investigators opined that this poor relationship may be the cause of patient's lack of knowledge about the disease. The identified factors hindering health seeking behaviour in a Nigerian study were socio-demographic factors such as gender, age, marital status, educational level and occupation while health care providers-related barriers inluded obstacles were poor attitude of health workers, irregular diabetes education in clinics , limited number of nutrition education sessions or inability of the patients to estimate the desired quantity of food, lack of reminder post cards or phone calls about upcoming patient appointments and delayed start of appointment or time wasting in clinics (Okolie, Ehiemere, Ezenduka, and Ogbu, 2010).

Lack of knowledge, financial barriers, non-adherence to medication regimen, socio-cultural barriers such as self-medication with local herbs, and lack of privacy during doctors' consultation were found to be related to poor diabetes management among Type 2 diabetics

in Nigeria (Yusuf, Obe, and Joseph, 2008). A study conducted to explore the facilitators and barriers to self-management of diabetes among 38 urban African-American adults revealed the following barriers: pain associated with glucose monitoring, nutritional habits, memory failure, and perceived lack of personal control over diabetes (Chlebowy, Hood, and LaJoie, 2010). In a study conducted in Uganda, healthcare was mainly sought from nurses and physicians in the professional sector. It was also documented that females used more free-of-charge governmental institutions. Respondents' perception about health care failure to manage DM or related complications led many, particularly women, to seek alternative treatment from complementary alternative medicine practitioners. The same study also showed that living conditions, including healthcare organisation and gender, seemed to influence health seeking behaviour (Hjelm and Atwine, 2011). Imran, Jauhari, Chaudhry, Uddin, Bengali, Uddin, Huq and Jaffer (2015) in a qualitative study conducted among south Asian DM patients in America, reported that Cultural factors thwarting self-care included fasting during Ramadan and adhering to traditional social roles, especially among women.

In a study conducted in Bostwana among Type 2 DM patients, Relatively high rate of non-adherence to both diet and exercise recommendations by patients suffering from type 2 diabetes mellitus was reported by Ganiyu, Mabuza, Malete, Govender and Ogunbanjo (2012). Ganiyu et al (2012) went on to highlight the main reasons for non-adherence to diet as poor self-discipline, lack of information and the tendency to eat out while the main reasons for non-adherence to exercise were lack of information; the perception that exercise exacerbated the illness and lack of an exercise partner.

Faria, Rodrigues, Zanetti, Araújo and Damasceno (2013) have opined that despite evidences of the importance of a regular physical exercise practice and the adoption of a balanced eating plan, it may be difficult to to achieve this in cases of elderly patients and in those with comorbidities such as angina and arthritis.

2.7 Theoretical framework

The theoretical framework used to facilitate the design of this study is the Health Belief Model (HBM). The model is used to throw light on perceptions or set of beliefs that could influence people's preventive health behaviours and possible factors which account for non-adherence with recommended health related actions. It was developed in the 1950s by a group of U.S. Public Health Service social psychologists who wanted to explain why so few people were participating in programs aimed at preventing and detecting diseases (Rosentock, Derryberry and Carriger, 1959).

The HBM is seen as an intra-personal level theory because the underlying concept of the theory is that behaviour towards health is majorly determined by personal beliefs or perceptions about a disease (Jack, Grim, Gross, Lynch and Mclin, 2010). The model also focuses on Individuals' perceptions of the threat posed by a health problem, the benefits of avoiding the threat, and factors influencing the decision to act. The HBM is by far one of the most commonly used model in health education and health promotion (Glanz, Rimer and Lewis, 2002).

The health belief model is characterized by six major constructs and they are explained as follows;

Perceived susceptibility: this construct explains the individual's opinion regarding his or her personal chances of developing a condition. It examines the individual's perceptions about how likely the behaviours they partake in are going to lead to a negative health outcome. It is the first construct and must be treated before change in behavior can occur.

Perceived severity: this shows an individual's opinion about the seriousness of a specific health condition and its consequences. Perceived severity addresses how serious the disease that a person is vulnerable to can be. This construct is usually based on medical information or experience of the disease. At this level, HBM seeks to increase awareness of how serious the outcomes of behaviours can be in order increase the quality of one's life.

Perceived benefits: this refers to the patient's belief in the efficacy of the advised or recommended action to reduce risk or seriousness of impact. It could better be explained that perceived benefits are the beliefs that individuals have about what they stand to gain health wise if they change their behaviour to encourage better health status. This could include better quality of life and reduction in cost of maintenance.

Perceived barriers: These are majorly obstacles that are in the way of adopting a recommended health-related behaviour by individuals. At this stage barriers such as cost of management, risk of psychological problems are some of the barriers that could dissuade individuals from changing their behaviour. Perceive benefits must out-weigh perceived barriers so that adoption of better attitudes and behaviours can occur.

Cues to action: These are reminders or prompts to enable individuals take actions consistent with an intention. It could be described as anything that triggers a decision to adopt a new behaviour. It could also be explained as reasons why an individual realises that he could be threatened by a disease condition. This ranges from advertisements in the media to personal communications with health professionals, family members, relatives and peers.

Self-efficacy: This was the construct that was added last to the health belief model. It is also a key concept that drives Albert Bandura's social cognitive theory. Bandura defines perceived self-efficacy as an individual's judgment of his or her capabilities to organize and execute courses of action required to attain designated types of performances (Champion and Skinner, 2008).

2.7.1: Application of HBM to the study

Perceived Susceptibility – this tenet basically points towards the beliefs of individuals about the risk of complications of diabetes and the progression of the disease. When patients with DM do not believe that they are at risk of complications, they tend not to be conscious of the behaviours needed to decrease the burden of the disease and as such naturally engage in bad practices which do more harm than good. This could be corrected when information and awareness about populations(s) are at risk are provided.

This construct was used to develop Knowledge and perception questions such as; question 11 *"What are the risk factors of diabetes?"* and perception questions such as question 18.2 *"Diabetes is not a serious health challenge",* question 18.6 *"Complications can arise from diabetes if it is not well controlled"*

Perceived Severity: This is the belief about the seriousness of a condition and its consequences. In this case, it brings to fore how individuals perceive the severity of DM, its impact and consequences for individuals, families and country.

Individuals who are living with the disease at the early stages and see diabetes as not serious could continue without changing their lifestyle to aid management. This could eventually exacerbate the progression of the disease and result into complications. But those who are influenced by what they read about the multifaceted effects of the disease could manage it better by making good modifications to lifestyle which will result into good quality of life. To this end, how individuals perceive the severity of DM goes a long way in determining how serious they will get in making efforts to stop the effects of the condition. To correct the unfavourable perception about the severity, the consequences of diabetes could be reinforced in media campaigns and health care facilities.

This construct was used in designing questions such as question 14: *"What are the health problems that could result from diabetes?*" and perception questions relating to productivity such as question 21.1: *"Diabetes limits the number of working hours of sufferers"* question 21.4: *"Diabetes management makes sufferers absent themselves from work occasionally"*

Perceived Benefits: This explains beliefs about what individuals stand to gain if they live a healthy lifestyle, and follow the recommended treatment plan – for those living with the condition. It is with this construct that individuals start asking questions such as "will adherence to the recommended dietary plan help in slowing down the progression of the disease?" "Will lifestyle modifications help in preventing the occurrence of the disease?"

For those who believe that engaging in certain practices will be beneficial to their health; they tend to adopt these new behaviours. Therefore, if a diabetic patient believes in the benefit of a recommended dietary plan for example, it is very possible that such patient will

adhere to the plan. As a result, to correct the inadequacies relating to the beliefs of an individual about this construct, benefits of adopting healthy behaviour could be emphasised. This construct was used to develop questions such as question 13 "*What are the measures that can be used to prevent complications of diabetes?"* and question 17 *"appropriate dietary habit for a diabetic patient"* which if practiced well will lead to good health.

Perceived Barriers – This explains the individual's evaluation of obstacles that will prevent change in behaviour; if there are barriers, it is very possible that an individual will not adopt change. Most times to address this construct, the perception of benefits by individuals must offset perception of barriers for adoption of a good behaviour. For example, beliefs of individuals about the material and psychological costs of taking action which includes direct and indirect cost of treatment might make it difficult for a typical diabetic patient to visit the hospital for care where information about his condition is available. However, if the patient believes in the benefits of having good health which will result in productivity through better management, it is very possible that the patient will seek ways in overcoming the obstacle of cost through strategies such as social support and eventually adopt a good health seeking behaviour. Perceived barriers could also be mitigated with health promotion strategies such as social support to offer reassurance, provision of vital information and reminders and assistance in cash or kind.

This construct was used in design questions on perceptions relating to cost of management of the disease found in question 19 of the instrument and others such as question 20.1: *"It is expensive to prepare my food separately from that of family members.",* question 33: *"Are you earning enough to help you manage your condition well?"* as well as factors prevent respondents from visiting hospitals, use of drugs and dietary habit found in question 41.

Cues to Action – This includes factors that activate or help initiate the readiness of individuals to change. These factors are majorly events, people or materials that a vital in reinforcing the message of change and aiding the adoption of a new behaviour. For example, it is very possible that individuals living with DM will adhere better to different forms of care such as visit to the hospital and personal glucose monitoring if the spouse, friends, children

and relatives are involved. Social support could be encouraged in this regard to help in assisting diabetic patients to adopt or maintain health behaviours.

This was used in designing questions on use of glucometer for those who do not know how to use it and this can be found in question 39c. It also helped in designing question 29 *"Does anyone accompany you to the hospital when you are attending the diabetes clinic?"*

Modifying factors – This is not one of the six constructs of the health belief model but it is vital in deterring behaviour. They are majorly variables that influence personal perceptions. They are inherent individual characteristics that could determine the decision of an individual. These factors include variables such as marital status, duration of experience of diabetes condition, education level and ethnic group. An individual who has a low education level might have poor practice because he has not been exposed to the necessary skills that will enable him make an inform decision about his health. These factors were used in designing the socio-demographic characteristics of the instrument used in this study.
All the questions referred to in this section can be found in the instrument in appendix I. A diagrammatic presentation of the application of the HBM is shown in figure 2.1

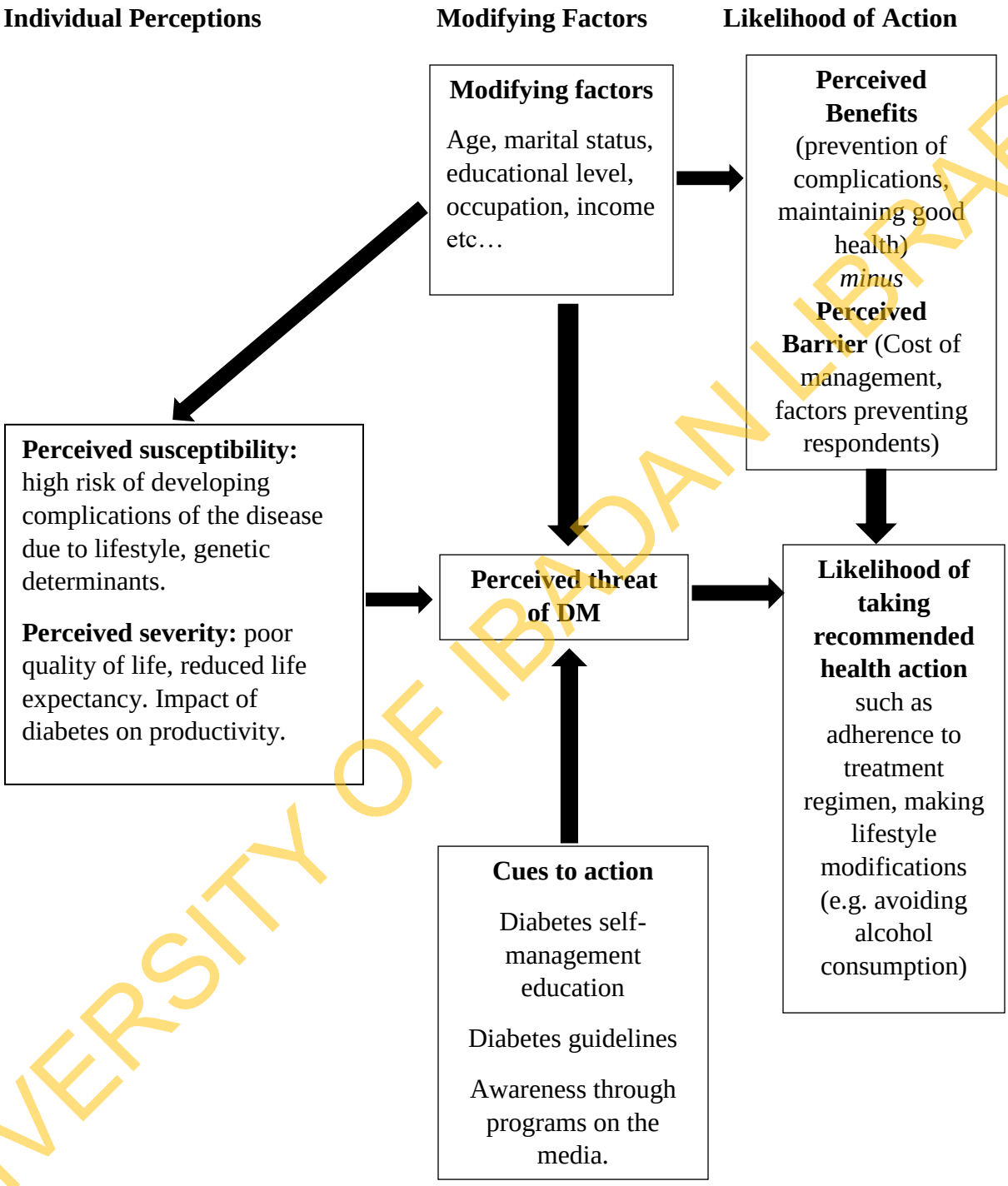


Figure 2.1 Source: Stretcher and Rosentock (1997) Health Belief Model applied to the study

CHAPTER THREE

METHODOLOGY

This chapter presents the study design and the description of the study area. The other components of the methodology include the study population, sample size determination and sampling technique, inclusion and exclusion criteria, validity and reliability, data collection process, ethical consideration, data management and analysis and limitations of the study.

3.1 Study design and scope

The descriptive cross sectional study design was adopted. The study focused on diabetic patients attending University College Hospital, Ibadan, Oyo State, Nigeria.

3.2 Description of the study area

The study was carried out at the University College Hospital in Ibadan, Nigeria. The hospital is a 900-bed tertiary hospital located in Ibadan North local government are of Oyo state. The University College Hospital, Ibadan was established in November 1952 in response to the need for the training of medical personnel and other healthcare professionals for the country and the West African Sub-Region. The tertiary hospital is affiliated with the University of Ibadan and serves as a major tertiary referral centre in Nigeria.

Ibadan North local government where the hospital is located is one of the 11 Local Government Areas in Ibadan. In the North it is bounded by Akinyele Local Government and in the West by Ido Local Government, Ibadan south West and also Ibadan South East Local Government. Ibadan North LG shares a boundary in the East with Ibadan North East and Lagelu Local Governments. Apart from UCH and University of Ibadan, Ibadan Poly is another tertiary institution located in the local government.

The hospital at inception in 1948, prior to the act that formerly established it in 1952 had two clinical Departments (Medicine and Surgery). Since then the hospital has evolved to accommodate 60 Departments all together. The hospital has 52 service and clinical departments and runs up to 75 consultative out-patient clinics a week in 45 specialty and sub-specialty disciplines.

The study was carried out at the Medical Outpatient unit (MOP) of the hospital. Several specialty clinics are run in the MOP weekly including endocrinology where most diabetic patients are seen. This is in addition to some other medical conditions such as hypertension. Some of the health care services rendered in the MOP are records of patients, consultation and dispensing of drugs.

The clinic for diabetic patients takes place every Monday and a second clinic on alternate Fridays. The clinic starts at 8am and four consultants are in charge of diabetic patients in the unit. The MOP also houses the secretariat of the Diabetic Association where DM patients also show up for support meetings and beneficial services.

3.3 Study population

The study population consisted of diabetic patients attending the University College Hospital. This included patients who attend different clinics in the hospital but have diabetes as their major ailment. The population consist of respondents of different socio-demographic characteristics.

3.4 Inclusion Criteria and Exclusion Criteria

The respondents who met the criteria for this study were consenting diabetic patients who attended University College Hospital Ibadan for care. Non consenting diabetic patients and other patients who do not suffer from diabetes were excluded from the study.

3.5 Sample size determination and sampling procedure.

The sample size for this study was estimated from the records of the hospital**.** From the records at the Medical Out patients unit, the population of the diabetic patients attending clinic in University College hospital Ibadan from January 2014 to August 2015 was estimated to be 200. Thus the sample size of this study will be determined using (Yamane, 1967) sample size formula below:

$$n = \frac{N}{1+N(e)^2}$$

Where:

n = required sample size

N = Estimated population of diabetic patients at UCH (200)

e = degree of error tolerance at 5%

$$n = \frac{200}{1+200(0.05)^2}$$

$$n = \frac{200}{1.5}$$

n = 133.3

Adjusting the sample size for 20% non-response rate:

$$n_f = \frac{n}{1-NR}$$

Where:

NR = Non-response rate of 20%

n_f = Adjusted sample size due to non-response

$$n_f = \frac{200}{1-20\%}$$

n_f = 166.3.

Though the original sample size for this study was 166, the researcher collected data from all consenting respondents during the period of the study so as to make the findings of this study more generalizable to the general population.

3.5.1 Sampling technique

Purposive sampling technique was adopted for this study. To this end, 207 consenting patients attending the diabetic clinic on different clinic days between 7th September and 28th September, 2015 were selected for the study.

3.6 Method and instrument for data collection

The Semi-structured interview method was used facilitated by use of semi-structured interviewer administered questionnaire. As shown in the appendix i, the instrument contained five sections which were labelled A-E. Section A contain questions on respondents' socio demographic details. Section B contains knowledge of respondents on diabetes. Questions on perception of diabetic patients are contained in section C. Questions on the direct and indirect cost of diabetes are contained in section D while section E was used to measure the health-seeking behaviour of respondents.

3.7 Validity and reliability of instrument

Validity of the instrument

Validity was ensured through extensive literature review to identify necessary variables that would be included in the instrument for measurement. The draft instrument was given to the investigator's supervisor for review. An expert from the Department of Health Policy and Management, Faculty of Public Health, University of Ibadan, was also consulted to help in reviewing the instrument with specific reference to the issues relating to economic cost. The draft questionnaire was then translated into Yoruba (the local language spoken by most people in the study area) by someone who is versed in both English and Yoruba. The Yoruba version was then given to yet another person equally versed in both Yoruba and English to translate back to English. The inconsistencies and errors in translation observed as a result of this process were addressed/corrected.

Reliability of the instrument

The draft instrument was pretested among similar diabetic patients at the Ring Road General Hospital, Ibadan located in Ibadan South West local government area. Copies of the instrument were pretested among 10% of the total sample size (166.3) which amounted to 16 respondents. After the pre-test the data were checked for completeness, sorted and cleaned. A coding guide was developed and used to facilitate the entry of the data into the computer. Subsequently, the data were analysed using descriptive statistics.

The data were then subjected to Cronbach Alpha statistical test. Cronbach's alpha is a measure of internal consistency, that is, how closely related a set of items are as a group. In

this test a result showing a correlation coefficient greater than 0.50 is said to be reliable and the closer the value of the reliability test to 1, the more reliable is the instrument. In this study, the Cronbach alpha score obtained was 0.72. This thus confirmed its high degree of reliability. The result of the pre-test was used to adjust or modify questions that were ambiguous to respondents.

3.8 Recruitment of research assistants

Six Research Assistants (RAs) were recruited and trained for the study. The candidates were fluent in both English and Yoruba Languages. During the training they were guided through the different sections of the research instrument. They were also taught how to ask questions without causing any emotional or psychological harm to respondents. Training methods such as demonstrations and role-plays were used to practice the interview process. The RAs were taught how to obtain informed consent from respondents and the importance of valid data. They were taught how to review an administered questionnaire for completeness after an interview session. The RAs were involved in the pre-test exercise. This exercise created an opportunity for them to acquire practical experiences related to data collection.

3.9 Data Collection Process

The Six (6) trained research assistants comprising of 3 males and 3 females helped in the administration of the questionnaire at the site of the study. The data collection process was carried out over the course of three weeks, September 7th – September 28th on Mondays and alternate Fridays which were diabetic clinic days at UCH. The administration of the research instrument lasted for four hours on a typical data collection day from 7am to 11am.

The data collection process involved the following steps; visits to the unit where diabetic patients attend clinic in the hospital, identification of necessary gatekeepers such as the consultants at the clinic, the officials of the diabetic association and matrons in the clinic for formal introduction and to seek for permission to conduct the study. Rapport was established with an eligible respondent after greetings. This was followed by disclosure of the nature and objectives of the study. The possible inconveniences that maybe involved were also disclosed. Either written inform consent or verbal consent was obtained from the consenting participants. Questionnaires were then administered to the respondents while they were

waiting for receive care. Finally, after each interview session, the administered questionnaire was reviewed for the purpose of completeness.

3.10 Ethical consideration

The study was submitted to the UI/UCH ethics review committee for ethical approval (see appendix). Informed consent was obtained from respondents before questionnaires were administered (see appendix for informed consent form). Ethical issues like confidentiality, right to decline interview at any stage and non-exposure to risk were discussed with each respondents before the interview session. Only respondents who gave informed consent were recruited into the study. They were informed that participation is voluntary and that data collected would be used mainly for research purposes.

In order to assure respondents of confidentiality of the information that was supplied, names of respondents were not required, only identification numbers were assigned to the questionnaires by the investigator for proper recording. The research did not require the conduct of invasive procedures. However, there was the probability that some of the respondents found some of the questions uncomfortable to answer. Participation in the study was strictly voluntary. As a result, participants were free to withdraw from the study at any time.

3.11 Data Management and Analysis

All the administered questionnaires were checked one by one and edited for purpose of completeness and accuracy. A serial number was written on each copy of the questionnaire for easy identification, recall of any instrument with problems for correct data entry and analysis. A coding guide was developed after a careful review of responses to facilitate coding and data entry. The copies of the questionnaire were coded and entered into the computer using the serial numbers that had been pre-assigned to each questionnaire. A template was designed on the Statistical Package for the Social Sciences (SPSS version 22) software for entry of the coded data and analysis. The data entered into the computer were analysed using descriptive statistics and inferential statistics such as Chi-square test, Fisher's exact test and t-test at $P = 0.05$.

Respondents' knowledge were measured on 36-point scale (see appendix III for the knowledge scale). Knowledge Score (KS) of ≤ 18 were rated as poor knowledge. The KS of 19-25 were rated

as fair knowledge while KS ≥26 were rated good knowledge. The health seeking behaviour of respondents was measured on a 19-point scale using selected questions (see appendix IV for the Health Seeking Behaviour scale). Health Seeking Behaviour Score (HSBS) of 0-10 was rated as poor health seeking behaviour and 11-19 was rated as good health seeking behaviour. The generated results are presented in the tables and charts in chapter four.

3.12 Limitation of study

The limitation was that there was recall problem on the part of some of the respondents with special reference to items that had to do with cost. An attempt was made to ameliorate this problem through series of probing questions. Some occasions, the respondents were persuaded respectfully to show receipts of items such as drugs if they had it on them during the interview session. Significant others who followed some to the clinic were also useful in providing useful information relating to cost. However, there is no way to accurately verify the claims of the respondents including the significant others.

Another limitation was that indirect cost should have been calculated by obtaining indirect expenditures as oppose to how it was done in this study. The method used for determining indirect cost in this study involved eliciting information on the social burden and pattern of absenteeism. This method does not show the precise indirect cost to patients.

CHAPTER FOUR

RESULTS

4.1 Socio-Demographic Characteristics of Respondents

The socio-demographic characteristics of respondents are presented in table 4.1a. More than half (56.0%) of the respondents were female while the rest (44.0%) were males. The ages of the diabetic patients ranged from 38 to 87 years and the mean age was 64.23±10.05 years. Some respondents (37.2%) fell within the 61-70 years age bracket. Few (27.1%) of the respondents were ≥71 years of age. Respondents aged ≥61 years (64.3%) topped the list. Recipients of tertiary education (38.2%) topped the list followed by those with secondary edcuation (27.1%). Traders accounted for 41.1% followed by those who were retired (37.7%).

Majority (76.3%) of the respondents were married, 19.3% were widowed, 3.4% were divorced while other categories such as single and separated constituted 1.0%. Most (91.0%) respondents were Yoruba. Majority (71.0%) of the respondents were Christians while 29.0% were Muslims.

Table 4.1b shows respondents' supplementary sources of outcome that less than half (42.8%) of respondents depend on their children as supplementary sources of income while a closer number (35.7%) of respondents have other businesses as supplementary sources of income.

Figure 4.1 dipicts the different categories of respondents according to their average monthly income. More (26.2%) of the respondents fell into the the income bracket of 40,001-60,000 naira, (22.6%) earned between 20,001 and 40,000 naira, 17.9% of respondents earned below 20,000 naira. Fewer (14.9%) respondents fell into the income bracket of 60,001-80,000, 10.3% earn above 100,001 naira while 8.2% fell into the income bracket of 80,001-100,000.

Table 4.1a: Socio-demographic characteristics

N=207

Demographics	No	%
Sex		
Male	91	44
Female	116	56
Age* (in years)		
≤50	27	13.0
51-60	47	22.7
≥61	133	64.3
Level of education		
No formal education	20	9.7
Primary education	52	25.1
Secondary education	56	27.1
Tertiary	79	38.2
Occupation		
Civil servant	26	12.6
Trader	85	41.1
Retired	78	37.7
Others**	18	8.6
Marital Status		
Single	1	0.5
Married	158	76.3
Divorced	7	3.4
Widowed	40	19.3
Separated	1	0.5
Ethnic group		
Yoruba	189	91.3
Hausa	3	1.4
Igbo	13	6.3
South south ethnic group (Edo and Delta)	2	1.0
Religion		
Christianity	147	71.0
Islam	160	29.0

*Mean age = 64.2±10.0, Median = 65, Range = 38-87

**Unemployed 4(1.9%), Clergy 3(1.4%), Tailor 2(1.0%), Publisher 1(0.5%), Caterer 1(0.5%), Teacher 1(0.5%), Driver 1(0.5%), Artist 1(0.5%), Farming 1(0.5%), School secretary 1(0.5%), Artisan 1(0.5%), Self-employed 1(0.5%).

Table 4.1b: Respondents' supplementary sources of income

N=56

Sources	No	%
Children	24	42.8
Business/Pension	20	35.7
Pension and children	5	8.9
Dependent on relatives	3	5.4
Others*	4	7.2

*Farmer-1(1.8), Block industry-1(1.8), Solicitor-1(1.8), Tailor-1(1.8)

N=199

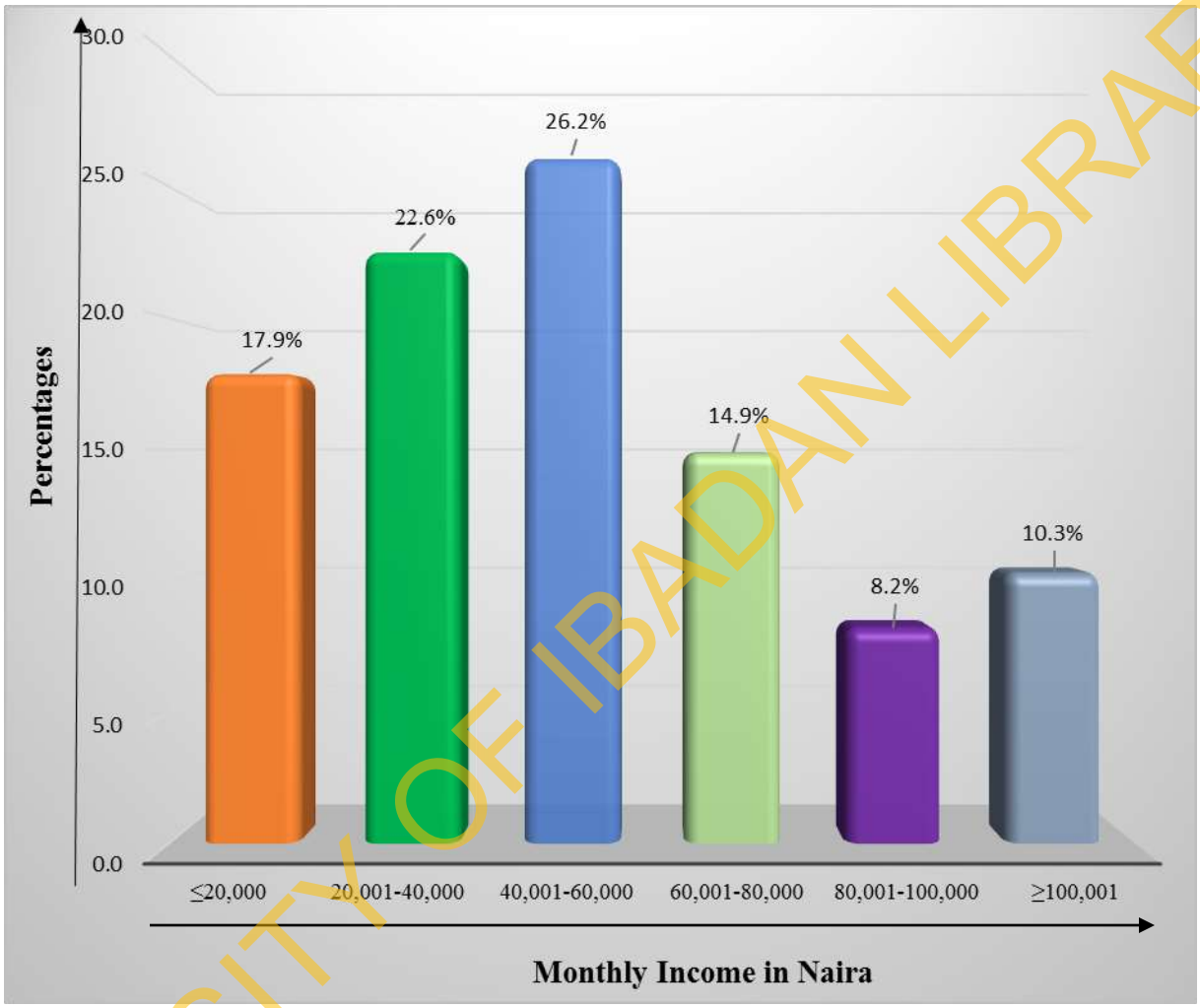


Figure 4.1: Reported average monthly income (in naira)

4.1.1: Duration of experience of diabetes among the respondents

The duration of experience of diabetes among respondents by gender is presented in table 4.2. Generally, More patients had been experiencing the disease by each of the listed duration. For instance, 59.0% of the females compared with males (49.0%) had been experiencing DM for ≤5 years. Slightly over half (51.5%) of the females compared with 48.5% males had had the disease for 6-10 years. Equal proportion of the males (50.0%) and females (50.0%) had been experiencing DM for ≥16 years (see table for details). Overall, the results showed that there was no significant relationship between duration of experience of DM and gender.

Table 4.2: Respondents' Duration of experience of diabetes by gender/sex

N=207

Duration in years	Gender differential		X^2	df	P-value
	Male (%)	Female (%)			
≤5	41(41.0)	59(59.0)	1.778	3	0.620
6-10	32(48.5)	34(51.5)			
11-15	6(35.3)	11(64.7)			
≥16	12(50.0)	12 (50.0)			

*Mean duration = 7.7±6.6 years

**Not significant (P>0.05)

4.2: Respondents' knowledge on diabetes

Respondents' knowledge on risk factors of diabetes was presented in table 4.3. Majority (83.1%) stated correctly that high intake of sugar can lead to the occurrence of the disease. Over half of the respondents (57.5%) correctly stated that sedentary lifestyle or lack of physical exercise as a possible cause of DM. the proportion of respondents who linked old age and heredity to DM were 55.1% and 55.1% respectively. A large proportion (73.8%) correctly stated that DM cannot be caused by supernatural forces

Table 4.4 shows respondents' knowledge relating to symptoms of DM. Most (92.9%) of the respondents correctly reported that excessive thirst was a symptom of DM. similarly, respondents who correctly identified frequent urination, tiredness and delay in healing of wounds as symptoms of DM were 98.0%, 79.7% and 70.2% respectively. A little over half (50.7%) and 61.4% stated as false the notion vomiting and rashes were a symptoms of DM respectively.

Respondents' knowledge relating to measures for preventing complications of DM was highlighted in table 4.5. Most (94.6%) of respondents correctly identified regular physical exercise as a measure to prevent DM while 96.1% also reported that adherence to recommended dietary/food intake as a preventive measure. Majority (89.4%) stated correctly that checking of blood sugar level was a preventive measure as well as adherence to recommended drug prescription (93.2%) and going for follow-up care as recommended by health care providers (90.4%).

Table 4.6 depicts respondents' knowledge about complications that could result from diabetes. Hypertension, blindness and leg ulcers were correctly identified as possible complications of DM by 87.4%, 85.0% and 81.6% respectively. Majority (61.8%), (67.1%) reported as false the notion that cancer and HIV/AIDS respectively are possible complications of DM.

Respondents' knowledge on medical tests for DM was shown in table 4.7. Majority (81.4%) of the respondents correctly identified urine examination as a medical test for DM. Similarly,

most (94.2%) identified blood sugar test as a medical test for DM while (92.5%) correctly identified glucometer is a medical device used for home blood glucose monitoring by people living with diabetes. However, 59.0% reported as false the notion that stool examination was a medical test for DM.

Table 4.8 shows respondents' knowledge on appropriate dietary habit for a diabetic patient. Majority (72.0%) said a diabetic patient can take all kinds of food but in small amount, few (19.3%) stated a diabetic patient should only take special food while 6.8% reported that DM patients can take all kinds of food in any amount.

Table 4.3: Respondents' knowledge on the risk factors of diabetes mellitus

Risk factors	Responses			Total
	True (%)	False (%)	Don't Know (%)	
Old age	114(55.1)*	57(27.5)	36(17.4)	207
Heredity	114(55.1)*	61(29.5)	32(15.4)	207
Obesity	81(39.5)*	70(34.2)	54(26.3)	205
Sedentary lifestyle/lack of physical exercise	119(57.5)*	46(22.2)	42(20.3)	207
High consumption of sugar	172(83.1)*	20(9.7)	15(7.2)	207
Too much alcohol consumption	89(43.2)*	65(31.6)	52(25.2)	206
Malnutrition	28(13.7)	117(57.4)*	59(28.9)	204
Supernatural forces	7(3.4)	149(73.8)*	46(22.8)	202

*correct responses

Table 4.4: Respondents' knowledge on the symptoms of diabetes mellitus

Symptoms	Responses			Total
	True (%)	False (%)	Don't Know (%)	
Excessive thirst	189(92.7)*	7(3.4)	8(3.9)	204
Frequent urination	203(98.0)*	2(1.0)	2(1.0)	207
Tiredness	165(79.7)*	22(10.6)	18(8.7)	205
Rashes	11(5.3)	125(61.4)*	68(33.3)	204
Sign of fainting/collapsing	117(56.5)*	61(29.5)	29(14.0)	207
Vomiting	48(23.7)	103(50.7)*	52(25.6)	203
Delay in healing of wounds	144(70.2)*	37(18.1)	24(11.7)	205

*correct responses

Table 4.5: Respondents' knowledge relating to measures for preventing complications of diabetes

Preventive Measures	Responses			Total
	True (%)	False (%)	Don't Know (%)	
Regular physical exercise	193(94.6)*	5(2.5)	6(2.9)	204
Adherence to recommended dietary/food intake	199(96.1)*	5(2.4)	3(1.5)	207
Checking of blood sugar level	185(90.2)*	11(5.4)	11(5.4)	205
Eye test	96(47.1)*	65(31.9)	43(20.7)	204
Adherence to recommended drug prescription	193(93.7)*	7(3.4)	6(2.9)	206
Go for follow-up care as recommended by health care providers	187(90.3)*	11(5.3)	9(4.4)	207
Avoiding alcohol intake	102(50.0)*	56(27.5)	46(22.5)	204

*correct responses

Table 4.6: Respondents' knowledge on health problems or complications that could result from diabetes

Health problems	Responses			Total
	True (%)	False (%)	Don't Know (%)	
Hypertension	181(87.9)*	10(4.9)	**15(7.2)**	206
Visual impairment	176(85.4)*	10(4.9)	20(9.7)	206
Leg ulcers	169(82.0)*	17(8.3)	20(9.7)	206
Kidney failure	104(50.2)*	39(18.9)	64(30.9)	207
Cancer	8(3.9)	128(61.8)*	71(34.3)	207
Heart problems	125(60.4)*	30(14.5)	51(24.6)	206
HIV/AIDS	13(6.4)	137(67.1)*	54(26.5)	204

***correct responses**

Table 4.7: Respondents' knowledge on medical tests for diabetes

Tests for DM	Responses			Total
	True (%)	False (%)	Don't Know (%)	
Urine examination	166(81.4)*	16(7.8)	22(10.8)	204
Blood sugar test	194(94.2)*	5(2.4)	7(3.4)	206
Stool examination	21(10.3)	121(59.0)*	63(30.7)	205
Chest examination	34(16.7)	109(53.4)*	61(29.9)	204
Eye test	110(55.8)*	63(32.0)	24(12.2)	197
Glucometer**	185(92.5)*	9(4.5)	6(3.0)	200

***Correct responses**

**This a medical device used for home blood glucose monitoring by people living with diabetes

Table 4.8: Respondents' knowledge on the appropriate dietary habit for a diabetic patient

N=204

Appropriate dietary habit for DM patients	**No**	**%**
Taking all kinds of food in any amount	14	6.8
Taking all kinds of food but in small amount*	149	72.0
Taking only special food	40	19.3
Always skipping meals as a way of controlling the disease	1	0.5

*****Correct response

4.2.1: Levels of knowledge relating to DM among respondents

The levels of knowledge relating to DM among respondents is shown in table 4.9. Respondents' mean knowledge score was 25.0±4.8. The respondents' knowledge score ranged between 5 and 33. Poor knowledge was represented by 0 to 18 points, 19 to 24 points represented fair knowledge while 25 to 36 points represented good knowledge. Majority (64.4%) of the respondents had good knowledge score. Few (26.6%) had fair score while 12.0% had poor knowledge of diabetes mellitus.

Table 4.9: Levels of knowledge relating to DM among respondents

Level of knowledge (in points)	**No (%)**
Poor Knowledge (0-18)	25 (12.0)
Fair Knowledge (19-24)	55 (26.6)
Good Knowledge (25-36)	127(64.4)
Total	**207(100.0)**

***Mean Knowledge score** = 25.0±4.8

4.2.2: Distribution of Knowledge scores by sex, age, level of education and marital status

The distribution of knowledge scores according to sex is shown in table 4.10. Majority (60.4%) of the female respondents had good knowledge compared to few (31.0%) who had fair knowledge. Similarly, more (62.6%) males had good knowledge compared to 20.9% who had fair knowledge. The chi-square test showed that there is no significant association between sex of respondents and the knowledge score as the p-value was greater than 0.05.

Table 4.11 shows the distribution of knowledge scores according to age. Majority (62.4%) of the respondents who were ≥61 years of age had good knowledge compared to 23.3%, 14.3% who had fair and poor knowledge respectively. More (61.7%) respondents who fell within the 51-60 years age group had good knowledge while few (27.7), (10.6) had fair and poor knowledge. More than half (55.6%) of the respondents aged ≤ 51 years had good knowledge, 40.7% had fair knowledge while 3.7% had poor knowledge. The Fisher's exact test showed that there is no significant association between age of respondents and the knowledge score as the p-value was greater than 0.05.

The distribution of knowledge scores according to level of education is presented in table 4.12. Majority (64.3%) of the respondents who had secondary school education had good knowledge compared to 25.0%, 10.7% who had fair and poor knowledge respectively. A little over half (53.8%) of respondents who had primary school education had good knowledge few (25.0%), (21.2%) had fair and good knowledge. Below half (45.0%) of respondents who had no formal education had good knowledge, 40.0% had fair knowledge while 15.0% had poor knowledge. The Fisher's test showed that there is no significant association between level of education of respondents and the knowledge score as the p-value was greater than 0.05.

Table 4.13 shows the distribution of respondents' knowledge by marital status. Majority (65.2%) of the respondents who were married had good knowledge while few (23.4%), (11.4%) had fair and poor knowledge respectively. Half (50.0%) of the respondents who were widowed had good knowledge, 40.0% had fair knowledge while 10.0% had poor

knowledge. The Fisher's exact test showed that there is a significant association between marital status of respondents and the knowledge score as the p-value was lesser than 0.05.

Table 4.10: Distribution of Knowledge scores by sex

N=207

Gender	Knowledge scores (in points)			X^2	df	P-value
	Poor (<18) No(%)	Fair (19-24) No(%)	Good (25>) No(%)			
Male	15 (16.5)	19 (20.9)	57 (62.6)	4.63	2	0.099*
Female	10 (8.6)	36 (31.0)	70 (60.4)			

*Not significant (P>0.05)

Table 4.11: Distribution of Knowledge scores by age

N=207

Age group	Knowledge scores (in points)			*X^2	df	P-value
	Poor (<18)	Fair (19-24)	Good (25>)			
	No(%)	No(%)	No(%)			
≤50	1(3.7)	11(40.7)	15(55.6)	4.609	4	0.328**
51-60	5(10.6)	13(27.7)	29(61.7)			
≥61	19(14.3)	31(23.3)	83(62.4)			

*Fisher's exact test was used

**Not significant (P>0.05)

Table 4.12: Distribution of Knowledge scores by Level of education

N=207

Level of education	Knowledge scores (in points)			*X^2	df	P-value
	Poor (<18) No(%)	Fair (19-24) No(%)	Good (25>) No(%)			
No formal education	3(15.0)	8(40.0)	9(45.0)	9.357	6	0.144**
Primary education	11(21.2)	13(25.0)	28(53.8)			
Secondary education	6(10.7)	14(25.0)	36(64.3)			
Tertiary	5(6.3)	20(25.3)	54(68.4)			

*Fisher's exact test was used

**Not significant (P>0.05)

Table 4.13: Distribution of respondents' knowledge scores by Marital Status

N=207

Marital Status	Knowledge scores (in points)			*X^2	df	P-value
	Poor (<18) No(%)	Fair (19-24) No(%)	Good (25>) No(%)			
Single	1(100.0)	0(0.0)	0(0.0)	16.77	8	0.04**
Married	18(11.4)	37(23.4)	103(65.2)			
Divorced	2(28.5)	1(14.4)	4(57.1)			
Widowed	4(10.0)	16(40.0)	20(50.0)			
Separated	0(0.0)	1(100.0)	0(0.0)			

*Fisher's exact test was used

**Significant (P<0.05)

4.3: Respondents' perception of diabetes mellitus

Table 4.14 showed the general perception of diabetes among respondents. Few (39.6%) of the respondents disagreed with the statement "*People living with diabetes should eat all kinds of food to get well and stay healthy*" while 25.6% did not agree with the statement "strict *adherence to recommended drugs alone is necessary to prevent complications of diabetes mellitus*". Similarly More than half (60.9%) of the respondents disagreed with the notion that diabetes can be cured.

Specific perception relating to cost of management of diabetes among respondents was presented on table 4.15. Majority (62.3%) of the respondents believe drugs prescribed at the hospital were too expensive to purchase. Similarly, less than half (45.9%) agreed that the amount spent on diabetes management by patient is quite affordable. Majority (76.2%) of the respondents disagreed that self-management of diabetes is a better option than clinical care because of cost while few (20.8%) agreed with the statement. more (66.2%) respondents disagreed with the notion that having a personal glucometer is not necessary because of the cost.

Table 4.15 shows the specific perceptions relating to social burden of DM among respondents. A little above half (50.7%) disagreed with the statement *"It is expensive to prepare my food separately from that of family members"* Similarly, 53.1% disagreed with the notion that diabetes make one a big burden or problem in the family.

Specific perceptions relating to productivity showed the following response presented in table 4.17. More than half (56.5%) of the respondents believed diabetes limits the number of working hours of sufferers similarly, 55.6% agreed that diabetes management makes sufferers absent themselves from work occasionally.

Table 4.14: General perception relating to diabetes among respondents

Perception statement	Agree (%)	Disagree (%)	Undecided (%)	Total
People living with diabetes should eat all kinds of food to get well and stay healthy	121(58.5)	82(39.6)*	4(1.9)	207
Diabetes is not a serious health challenge	50(24.3)	148(71.8)*	8(3.9)	206
Diabetes is a disease that can be treated	188(91.3)*	14(6.8)	4(1.9)	206
Strict adherence to recommended drugs **alone** is necessary to prevent complications of diabetes mellitus	147(71.0)	53(25.6)*	7(3.4)	207
Diabetes is a disease that can be cured	48(23.3)	126(61.2)*	32(15.5)	206
Complications can arise from diabetes if it is not well controlled	192(93.2)*	8(3.9)	6(2.9)	206

*Favourable perceptions (i.e. perceptions likely to promote appropriate health seeking behaviour/ adherence to treatment regimen)

Table 4.15: Specific perception relating to cost of management of diabetes

Perception statement	Agree (%)	Disagree (%)	Undecided (%)	Total
The drugs prescribed at the hospital are too expensive to purchase	129(62.6)*	69(33.4)	8(4.0)	206
The recommended food/diet for people with diabetes is too expensive to prepare everyday	96(46.4)	101(48.8)*	10(4.8)	207
Amount spent on diabetes management by patient is quite affordable	95(45.9)	101(48.8)*	11(5.3)	207
Self-management of diabetes is a better option than clinical care because of cost.	43(20.9)	157(76.2)*	6(2.9)	206
Having a personal glucometer is not necessary because of the cost.	61(29.5)	137(66.2)*	9(4.3)	207

*Favourable perceptions (i.e. perceptions likely to promote appropriate health seeking behaviour/ adherence to treatment regimen)

Table 4.16: Specific perceptions relating to social burden of diabetes mellitus

Perception statement	Agree (%)	Disagree (%)	Undecided (%)	Total
It is expensive to prepare my food separately from that of family members.	100(48.3)	105(50.7)*	2(1.0)	207
Diabetes make one a big burden or problem in the family.	87(42.1)	110(53.1)*	10(4.8)	207
Having diabetes in a particular household affects the emotional health of family members.	92(44.4)	104(50.2)*	11(5.3)	207
Diabetes could affect the plans of the family.	111(53.6)	93(44.9)*	3(1.5)	207

*Favourable perceptions (i.e. perceptions likely to promote appropriate health seeking behaviour/ adherence to treatment regimen)

Table 4.17: Specific perceptions relating to productivity among respondents.

Perception statement	Agree (%)	Disagree (%)	Undecided (%)	Total
Diabetes limits the number of working hours of sufferers	117(56.5)*	79(38.2)	11(5.3)	207
Diabetes makes one less productive	108(52.2)*	88(42.5)	11(5.3)	207
Diabetes restricts the type of jobs sufferers can engage in	105(51.0)*	92(44.6)	9(4.4)	206
Diabetes management makes sufferers absent themselves from work occasionally	115(55.6)*	77(37.2)	15(7.2)	207

*Favourable perceptions (i.e. perceptions likely to promote appropriate health seeking behaviour/ adherence to treatment regimen)

4.4: Direct cost of diabetes mellitus

Table 4.18 shows the direct cost of DM among respondents. Majority (79.5%) fell in the category of respondents that spent between 101-500 naira for transport per visit to the hospital. The mean amount spent on transport per week was ₦ 367.2±276.1 with the median cost as ₦300.0. Majority (76.3%) spent ≤5,000 naira per week on recommended diet while few (17.5%) spent 5,001-10,000 naira on the same item. The mean amount spent on recommended diet was ₦5.255.4±3616.1 with the respondents spending a median cost of ₦4,500.0.

On the money spent on oral agents/medications per month, more than half (54.8%) of the respondents spent between 501 and 1500 naira while few (19.8%) spent ₦501 naira on the item. the mean amount spent by respondents on oral agents/medications was ₦1352.6±1048.7 and the median amount spent was ₦1250.0.

A little over half (52.6%) spent 600 naira on blood sugar test per visit while few (28.5) spent 400 naira on the same test. The mean amount spent by respondents on blood sugar test was ₦524.1±87.1. The median cost was ₦600.0. Majority (76.3%) spent 1,250 naira on consultation per visit while 21.3% of the respondents reported that they spent 900 naira on consultation as well. The mean amount spent by respondents on blood sugar test was 1176.3±144.1 while the median cost was ₦1,250.0. The overall direct mean cost was ₦7577.7±4071.8 while the overall direct median cost was ₦6950.0.

When asked the question "Do you have other health problems as a result of diabetes?" majority (76.8%) said no while few (21.3%) said yes. The health problems or challenges experienced by respondents apart from DM is presented in table 4.19 Majority (64.0%) of the respondents reported that they are suffering from High BP/Hypertension together with diabetes 10.7% reported eye problem while 8.5% reported unhealed injury.

Figure 4.2 shows money spent to manage DM and other health challenges. Less than half (45.5%) respondents spent between 1,000 naira and 5,000 naira while few (25.0%) of respondents spent ≥10,001 naira. The mean amount spent was ₦8835.2±6609.4 while the median was ₦6500.0.

Table 4.18: Direct cost of diabetes mellitus among respondents

Services and cost (in naira)***	No	%
Transport per visit (N=176)**		
≤100	16	9.1
101-500	140	79.5
≥501	20	11.4
$\overline{X}$ **Cost**: 367.2±276.1		
Median Cost: 300.0		
Recommended diet per week (N=177)		
≤5,000	135	76.3
5,001-10,000	31	17.5
≥10,001	11	6.2
$\overline{X}$ **Cost:** 5.255.4±3616.1		
Median Cost: 4500.0		
Oral agents/medications per week* (N=197)		
≤501	39	19.8
501-1,500	108	54.8
1,501-2,500	36	18.3
≥2,501	14	7.1
$\overline{X}$ **Cost:** 1352.6±1048.7		
Median cost: 1250.0		
Blood sugar test per visit (N=137)**		
400	39	28.5
500	26	19.0
600	72	52.6
$\overline{X}$ **Cost:** 524.1±87.1		
Median cost: 600.0		
Consultation fee per visit (N=207)**		
900	44	21.3
1,200	1	0.5
1,250	158	76.3
1,300	4	1.9
$\overline{X}$ **Cost:** 1176.3±144.1		
Median cost: 1250.0		

***Oral agents/medications item was recalculated from monthly cost to weekly cost.

**Cost of item per visit are also viewed as cost per week as visits to the clinic are made weekly

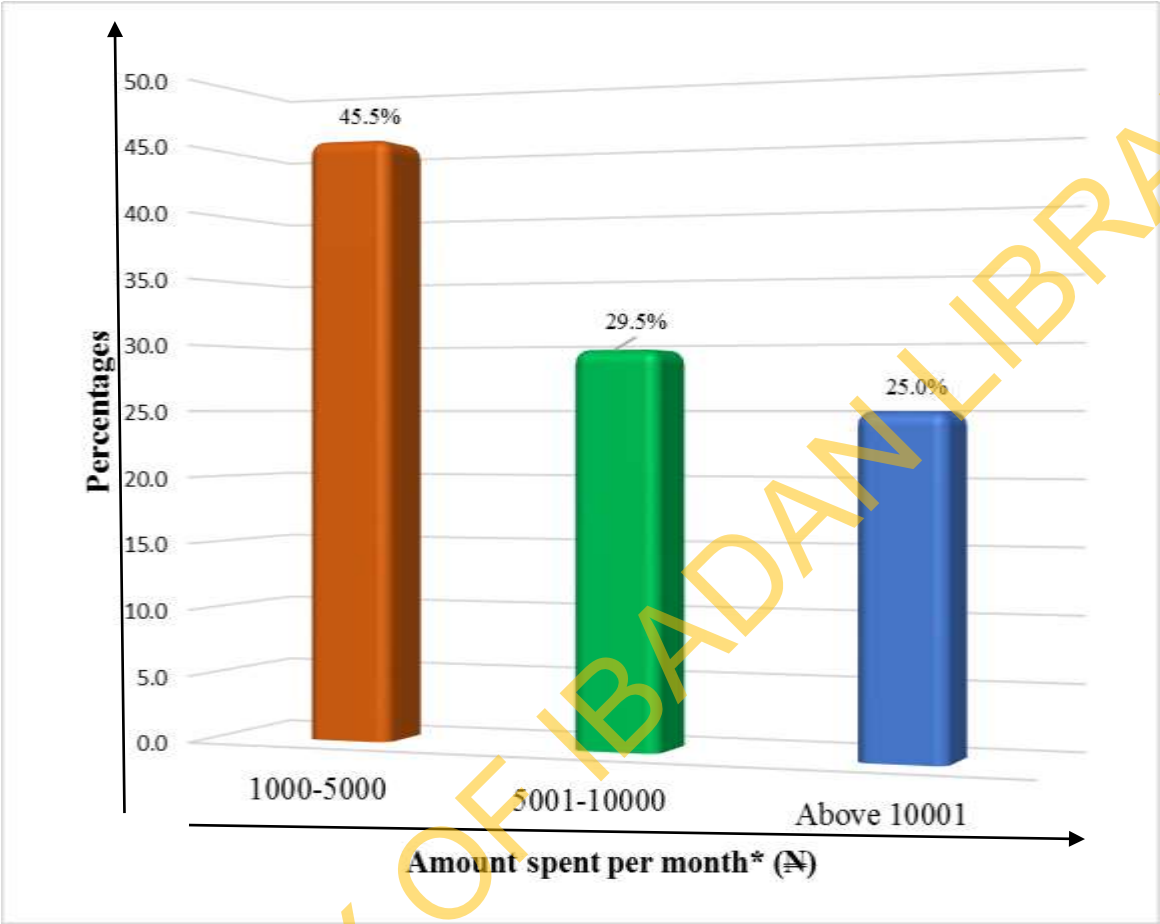
***Overall direct $\overline{X}$ cost: ₦7577.7±4071.8, overall direct median cost: ₦6950.0.

Table 4.19: **Health problems or challenges experienced by respondents apart from DM**

N=47

Health challenges experienced	No	%
High BP/hypertension	30	64.0
Eye problem	6	12.8
Unhealed injury	4	8.5
Glaucoma	2	4.2
Hypertension and kidney problem	2	4.2
Ear abscess with delayed healing	1	2.1
Knee pain	1	2.1
Eye and body pain	1	2.1

N=44



***Mean= ₦8835.2±6609.4, Median=₦6500.0**

Figure 4.2: Money spent to manage DM and other health challenges

4.4.1: Indirect cost of diabetes mellitus

The number of days respondents visited the clinic for diabetic care in the month preceding the study is presented in table 4.20. Majority (80.2%) of the respondents reported that they visited the clinic for diabetic care just one day in the last one month while 9.7%, 7.7% of respondents reported that they have visited the clinic ≥4 days and 2 days respectively.

Table 4.21 shows the mode of transportation among respondents to health care facility. Most (85.0%) respondents reported that they take public form of transportation to the hospital while 14.5% take private form of transportation to the hospital. More than half (57.3%) of the respondents who use public means of transportation were females while 53.3% of respondents who use private means of transportation were males. On the number of minutes it takes respondents to get to the hospital for care, little below half (49.3%) spent between 31-60 minutes while a few (38.3%) spent ≤30 minutes. The mean number of minutes it takes respondents to get to the health care facility was 51.04±30.29.

Table 4.22 shows the socio-economic burden of DM among respondents. Very few (24.6%) reported that someone accompanied them to the hospital for diabetic care while more than half (58.8%) stated that those who accompany them were employed.

The pattern of absenteeism from work due to DM is shown in table 4.23. Majority (63.6%) of the respondents reported that they are occasionally absent from work because of DM while few (35.8%) respondents reported that they are rarely absent from work.

Table 4:20: **Number of days visited clinic for diabetic care in the last one month preceding the study by respondents**

N=207

Number of days	No	%
1	166	80.2
2	16	7.7
3	5	2.4
≥4	20	9.7

*Mean=1.5±1.4, Median=1.0

Table 4.21: Mode of transportation among respondents to health care facility

Mode of transportation	No	%
Mode of transportation (N=206)		
Use of public means of transport	**176**	**85.0**
Male	75	42.6
Female	101	57.3
Use of private means of transport	**30**	**14.5**
Male	16	53.3
Female	14	46.7
Time taken to get to hospital in minutes* (N=201)		
≤30	77	38.3
31-60	99	49.3
61-90	11	5.5
≥91	14	7.0

*Mean=51.0±30.3, Median=45.0

Table 4.22: Socio-economic burden of DM among respondents

Socio-economic burden of DM	No	%
Whether anyone accompany respondent to the hospital when going for diabetes care (N=207)		
Yes	51	24.6
No	156	75.4
Employment status of persons that accompany respondent (N=51)		
Employed	30	58.8
Not employed	21	41.2

Table 4.23: Pattern of absenteeism from work due to DM among the respondents

N=151

Pattern of absenteeism	No	%
Always	1	0.6
Occasionally	96	63.6
Rarely	54	35.8

4.4.1.1: Distribution of respondents who are accompanied to the hospital for care by age

Table 4.24 shows the distribution of respondents who are accompanied to the hospital for care by age. Most (92.6%) of the respondents who were ≤50years reported that nobody accompanied them to the hospital for care while 7.4% of the same age reported that somebody accompanied them to the hospital. Majority (66.2%) of the respondents who were ≥61 years of age reported that nobody accompanied them to the hospital compared to 33.6% of that stated that somebody accompanied them to the hospital for care. The Fisher's exact test was used to test for association between ages and whether respondents were accompanied to the hospital as frequencies in some cells were less than 5. The association was significant as the p-value was less than 0.05.

Table 4.24: Distribution of respondents who are accompanied to the hospital for care by age

N=207

Age group	Whether anyone accompany patients to the hospital for care		*X^2	df	P-value
	Yes(%)	No (%)			
≤50	2(7.4)	25(92.6)	17.75	2	P=0.00**
51-60	4(8.5)	43(91.5)			
61-70	45(33.8)	88(66.2)			

*Fisher's exact test was used.

**Significant (P<0.05)

4.4.1.2: Time lost in health facility while accessing care

The time lost per place in the health facility while accessing care is shown in table 4.25. Most (93.4%) reported that they spent less than 30 minutes before they were attended to at the records department and the mean time spent was 39.3±28.7. Half (50.0%) of the respondents spent less than 30 minutes on tests while less than half (48.7%) spent between 31-60 minutes on tests. The mean number of minutes spent was 37.9±19.9.

More than half (56.4%) spent ≤60 minutes waiting see the doctor while few (32.5%) spent between 61-120 minutes. The mean time spent while waiting to see the doctor was 93.4±60.6. During consultation, majority (62.0%) of the respondents spent ≤60 minutes while few (33.7%) spent between 31-60 minutes. The mean time spent during consultation was 37.8±23.2.

More (63.6%) respondents spent between 1-30 minutes at the dispensary while few (36.4%) spent between 31-60 minutes on the same process the mean time was 32.2±17.6. overall, less than half (48.8%) of respondents fell within the group that spent 120-240 minutes in the hospital while (13.5%) respondents fell within the group that spent 1-120 minutes. The total mean time spent by respondents was 221.5±83.7 and this translates to almost four hours (3.7 hours).

Table 4.25: Time lost by respondents per place in health facility while accessing care

Time lost in minutes per place	No	%
Number of minutes spent at records post (N=198)		
≤60	184	93.4
61-120	12	6.1
121-180	1	0.5
$\overline{X}$ time	39.3±28.7	
Number of minutes spent to undergo routine tests (N=156)		
≤30	78	50.0
31-60	76	48.7
≥61	2	1.3
$\overline{X}$ time	37.9±19.9	
Number of minutes spent waiting to see the doctor(N=206)		
≤60	116	56.4
61-120	67	32.5
121-180	11	5.3
≥181	12	5.8
$\overline{X}$ time	93.4±60.6	
Number of minutes spent on consultation with doctor (N=205)		
≤30	127	62.0
31-60	69	33.7
≥61	9	4.3
$\overline{X}$ time	37.8±23.2	
Number of minutes spent to (N=154)		
1-30	98	63.6
31-60	56	36.4
$\overline{X}$ time	32.2±17.6	
Total minutes spent by respondents in hospital (N=207)		
1-120	28	13.5
120-240	101	48.8
241-480	76	36.7
≥481	2	1.0
$\overline{X}$ time	221.5±83.7	

4.5: Health seeking behaviour of diabetes patients as a result of direct and indirect cost of diabetes

Respondents' perception of adequacy of income used to manage DM is shown in table 4.26. Majority (69.6%) reported that they were earning enough to manage their diabetic condition while very few (29.6%) reported that they were not. Table 4.27 shows the frequency of drug use per week among respondents. Majority (77.6%) of the respondents stated that they take their drugs every day while 11.6% stated that they take their drugs twice in a week.

Frequency of hospital visit for diabetic care is shown in table 4.28. Few (32.9 reported that they visited hospital every two months, 26.7% reported that they visit monthly while 11.7% said they visit more than two times a week very few (9.2%) stated that they visit twice in a month .

Table 4.29 shows the pattern of hospital appointment keeping among respondents. Majority (96.1%) reported that they meet up with hospital appointments while very few (3.9%) said they do not. Out of the respondents that said they do not meet up, Majority (75.0%) gave lack money as their reason for not meeting up while few (25.0%) respondents gave strike has their reason for not meeting up.

The alternative sources of care among respondents is shown in table 4.30. Majority (63.3%) of the respondents claim they do not visit any other hospital apart from the University College Hospital (UCH). Few (21.7%) respondents said they visit state-owned hospital asides UCH while 13.5% reported that they visit private hospital asides UCH.

Table 4.31 shows respondents' use of glucometer. Majority (75.8%) said they own personal glucometer for blood sugar monitoring while (24.1%) said they do not have. Out of the respondents that have it, 63.8% reported that they know how to use it. More than half (60.0%) respondents said their children help them in using the glucometer while others few (20.0%) stated that their spouse help them in using the glucometer. Little above half (50.9%) reported that they use the glucometer always while 45.9% reported that they make use of the glucometer occasionally.

Typologies of barriers which have adverse influence on adherence to diabetic care are presented in table 4.32. Half (50.0%) respondents gave strike as their reason while 37.2%

respondents gave money as their reason. Most (94.7%) gave money as their reason for not using prescribed drugs as expected while all (100.0%) stated that money is the reason for not eating recommended food as expected

Table 4.26: Respondents perception of adequacy of income used to manage DM

N=207

Adequacy of income	No	%
Yes	144	69.6
No	53	29.6
Don't know	10	4.8

Table 4.27: Frequency of use of DM medications per week among respondents

N=205

Frequency of use	No	%
Once	16	7.8
Twice	24	11.7
Thrice	1	0.5
More than three times	5	2.4
Everyday	159	77.6

Table 4.28: Frequency of hospital visit for diabetic care by respondents

N=206

Frequency of visit	No	%
Everyday	1	0.5
Once a week	1	0.5
≥Two times	24	11.7
Twice a month	19	9.2
Monthly	55	26.7
Once in two months	68	33.0
Once in three months	9	4.3
Quarterly	20	9.7
Once in six months	7	3.4
On appointment only	2	1.0

Table 4.29: Pattern of hospital appointment keeping among the respondents

Variable	No	%
Whether keep hospital appointments (N=207)		
Yes	199	96.1
No	8	3.9
Reasons for failure to keep hospital appointments (N=8)		
Lack of Money	6	75.0
Strike	2	25.0

Table 4.30: Alternative sources of care for DM among respondents

N=207

Alternative sources	No	%
PHC Centre	2	1.0
Private Hospital	28	13.5
State-Owned Hospital	45	21.7
Faith-based	1	0.5
None	131	63.3

Table 4.31: Respondents' use of glucometer

Use of glucometer	No	%
Whether own a Glucometer? (N=207)		
Yes	157	75.8
No	50	24.2
Whether know how to use a glucometer? (N=157)		
Yes	132	84.1
No	25	15.9
Persons who help patients without glucometer to use glucometer at home? (N=25)		
Children	15	60.0
Spouse	5	20.0
Relative	4	16.0
Friends	1	4.0
Frequency of use of the glucometer? (N=157)		
Always	80	50.9
Occasionally	72	45.9
Rarely	5	3.2

Table 4.32: Typologies of barriers which have adverse influence on adherence to diabetic care

Typology of barriers	No	%
Barriers preventing respondents from visiting hospital for care (N=32)		
Strike	16	50.0
Money	12	37.6
Mild sickness	1	3.1
Work	1	3.1
Scarcity of fuel	1	3.1
No assistance	1	3.1
Barriers to use of prescribed drugs (N=19)		
Money	18	94.7
When exhausted	1	5.3
Barriers for not eating recommended food as expected (N=14)		
Money	14	100.0

4.6: Categorisation of health seeking behaviour among respondents and mean comparison with direct cost

Table 4.33 shows the categorization of health seeking behaviour among respondents. Majority (87.4%) of respondents had good health seeking behaviour as their health seeking behaviour score fell within the 11-19 bracket while few (12.6%) had poor health seeking behaviour. The mean score of respondents was 13.7±2.8.

Comparison of respondents' mean direct cost by health seeking behaviour categories is shown in table 4.34. The mean direct cost was more among respondents with poor health seeking behaviour (₦10,559.9±6278.4) compared to the mean direct cost among respondents with good health seeking behaviour (₦7149.3±3468.5). The t-test showed that there was a statistically significant difference between the means of direct cost reported for the two health seeking behaviour categories.

Table 4.33: Categories of health seeking behaviour among respondents

N=207

Categories*	Points	No	%
Poor health seeking behaviour	0-10	26	12.6
Good health seeking behaviour	11-19	181	87.4

*Mean=13.7±2.8

Table 4.34: Comparison of respondents' mean direct cost by health seeking behaviour of respondents

N=207

Categories	No (%)	Mean (in Naira)	SD	t	df	P-value
Poor health seeking behaviour	26(12.6)	10,559.9	6278.4	4.148	205	0.000**
Good health seeking behaviour	181(87.4)	7149.3	3468.5			

**Significant (P<0.05)

CHAPTER FIVE

DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS

This study was conducted to investigate the knowledge, perception, economic cost and health seeking behaviour relating to diabetes mellitus among diabetic patients receiving care at UCH, a tertiary health care facility. This chapter will focus on the following findings: socio-demographic information; knowledge of respondents on diabetes mellitus; respondents' perception on diabetes mellitus; direct and indirect cost of diabetes; and health seeking behaviour of respondents. Other sub-sections are implication of findings for health promotion and education, conclusions and recommendations.

5.1 Social demographic characteristics of respondents

The study revealed that more than half (56.0%) of the respondents were female. Ekpenyong, Akpan, Ibu and Nyebuk, (2012) as well as Chukwu, Ezebuiro, Samuel and Nwachukwu, (2013) had similar finding. Ekpenyong et al, (2012) conducted their study among civil servants in Eastern Nigeria while the other study (Chuckwu et al, 2013) was conducted among DM patients in Enugu state. The preponderance of females might be because generally more females often seek help for their health compared to their male counterparts (Vogel, Wester and Larson, 2007; AHRQ 2012; ACAAI, 2015; Lubega, Musinguzi, Omiel and Tumuhe, 2015). A possibility might also be that the prevalence of the disease is higher among females than males. It is to be noted that Akinjinmi, Adeyooye, Akingbade and Okerentugba (2014) whose study was conducted among volunteering participants from three communities in Ogun state. Akinjinmi et al in their study noted that there were more males (1.89%) with DM than females (1.19%). The fact that only volunteers participated in the study might have led to the finding. The finding of Akinjinmi et al is also similar to that of Shah and Afzal (2013) whose study was conducted among different Muslim populations of Manipur, India. Shah and Afzal reported 17.5% for males and 15.3% for females.

The ages of the respondents in this study ranged from 38 to 87 years with a mean of 64.2±10.1 years. This was similar to the study conducted by Kyari, Tafida, Sivasubramaniam, Murthy, Peto and Gilbert (2014) on prevalence and risk factors for diabetes and diabetic retinopathy in Nigeria. Kyari et al in their study, they noted that the age range was from 40-80+ years and a lower mean age (55.9 ±12.4). A mean age of 57.1±12.3 was reported by Chinenye, Uloko, Ogbera, Ofoegbu, Fasanmade, Fasanmade and Ogbu (2012) in a study conducted among diabetic out-patients in seven tertiary hospitals in Nigeria. It is to be noted that diabetes mellitus (especially the Type 2 form of the disease) is more prevalent in the adult populations (IDF, 2013). Over one third (37.2%) of the respondents were 61-70 years age. This is different from the studies conducted in Abeokuta, Nigeria (Akinjinmi et al, 2014) and Uganda (Namusisi, Sekandi, Kasasa, Wasswa, Kamara, Medard, Mihayo, Gitta and Mukanga, 2011.) where the highest prevalence of diabetes was found to be in the age group of 40-59 years in the Abeokuta study and 48 – 57 years in the Uganda study. Cultural and environmental factors might be responsible for the variation.

Many (41.1%) of the participants in this study were traders. A similar finding was recorded by Nwaokoro, Okokon, Nwaokoro, Emerole, Ibe, Onwuliri, Oputa and Chukwuocha, (2014) in a study conducted among type 2 diabetic out-patients attending Federal Medical Centre, Owerri, Imo State, Nigeria and Agofure, Oyewole and Okandeji-Barry (2015) who conducted their study also among type 2 diabetic out-patients attending Central Hospital, Warri, Delta state, Nigeria. This may be due to the fact that the study location (UCH) is a strategic place that is not far from major markets. It should be noted that lately, commerce is a major occupation among residents of Ibadan as a result of scarcity of blue and white collar jobs. Most respondents (48.3%) had had diabetes for less than 5 years. This is in tandem with the findings of studies conducted by Achigbu, Oputa, Achigbu, and Ahuche (2015) in Owerri and Abdulkadir, Esayas, Belayneh, Mustefa, Muluneh and Thirumurugan (2014.) among type 2 diabetic patients attending Adama Hospital Medical College, Oromia region, Ethiopia. The mean duration of living with diabetes from this study was 7.7±6.6 years. This is slightly similar to the 8.8 ± 6.6 years reported by Chinenye et al. (2012) in a study conducted in Nigeria.

5.2 Knowledge of respondents on diabetes mellitus

Majority of the participant had good knowledge of diabetes. Specifically, they gave right answers on items such as risk factors of DM, symptoms of DM, complications of DM, measures for preventing the complications of DM, medical tests for DM, and appropriate dietary habit. The good knowledge of risk factors of DM is in congruent with the study conducted by Zuhaid, Zahir and Diju (2012). Good knowledge of symptoms of DM in this study is similar to the findings of the studies by Thungathurthi, Thungathurthi and Kumar (2012) and that of Alele and Ilesanmi (2014). Thungathurthi et al (2012) conducted their study among DM patients in India while Alele and Ilesanmi (2014) conducted their study among adults in Edo state, Nigeria.

Good knowledge on complications of DM such as lifestyle modification and participation in physical excercise was recorded in a recent study conducted by Abdulkadir et al, (2014.). The knowledge of dietary habit recorded in this study is not different from the findings of Achigbu et al. (2015). Achigbu et al. conducted their study among diabetes patients in a tertiary clinic in southeast Nigeria.

However, some questions were not answered well; For instance, majority (56.8) either disagreed or did not know whether alcohol consumption was a risk factor for DM. Similarly, on the aspect of measures taken to prevent complications, 52.6% either disagreed or did not know if routine eye test was a measure aimed at preventing occular complications of DM. The findings of this study are similar to what was noted in a South Africa-based study by Phillip, Mashigeb and Clarke-Farr (2012). These observations showed that respondents were not overwhelmingly clear about these issues.

In this study, it was noted that overall, 64.4% respondents had good knowledge of DM. This is different from the study conducted by Jasper, Ogundunmade, Opara, Akinrolie, Pyiki and Umar (2014) and Dussa, Parimalakrishnan and Sahay, (2015). They reported that respondents' knowledge of DM was poor in their study. A possible reason or factor which account for the high level of knowledge of DM in the study is that UCH patients are always provided with patient education on the disease. More females had good knowledge and this is

similar to what was noted by Zuhaid et al. (2012) in a study conducted in Pakistan. It was found out that there was a significant relationship between marital status of respondents and their knowledge. It was further revealed that the proportion of respondents with good knowledge was more (65.2%) among those that were married. The reason for this result could be the motivation to know more so as to make informed decisions about the management of DM. This motivation could be as a result of the need to be healthy so as to discharge the duties that come with being married.

5.3 Respondents' perception of diabetes mellitus

The perception of respondents reported in this study was generally favourable in that their perception of various items is likely to promote appropriate health-seeking behaviour. The participants had favourable perception relating to cost of management of diabetes and social burden of the disease. This is in line with what was found in a previous study conducted by Adejoh (2012) among people living with DM in Kogi state, Nigeria. Nsereko, Bavuma, Tuyizere, Ufashingabire, Rwakageyo and Yamuragiye (2013) in their study which was conducted in Rwanda also reported a similar finding. Perceptions of the social burden and productivity related to DM were generally favourable and this is consistent with the study conducted by Fukunaga, Uehara and Tom (2011).

Slightly over half (53.1%) of the respondents did not share the view that diabetes can make one a big burden or problem in the family; about half (50.2%) also disagreed with the view that having diabetes affects the emotional health of members in a household. This was contrasting to the study conducted by (Fukunaga et al, 2011) among working adults with diabetes in Hawaii. These are all favourable perceptions that have potential for protecting sufferers from psychological problems. Perceptions are behavioural antecedents; so they are very important in the design of appropriate health education interventions. An understanding of the perceptions of DM patients will provide some clues to the health-seeking behaviours of the candidates of DM.

5.4: Direct cost of diabetes mellitus

This study showed that the amount spent on items relating to diabetes mellitus is huge. This fact is reflected in cost items such as transportation, diet, oral agents and consultation fees. Out of the items measured, recommended diet accounted for the largest cost with the mean

amount spent on recommended diet being 5,255.4±3616.1 naira which is equivalent to 26.4 US Dollars. This is in contrast to the findings obtained in the study conducted in Pakistan by Hussain, Naqvi, Khan, Rizvi, Alam, Abbas and Akram, (2014). Hussain et al showed that patients spent more on medicines per visit at 1,100 Pak Rupees which is equivalent to 10.5 US Dollars. The finding is also different to the study conducted by Odili and Okwuanasor (2012) among DM patients in Benin, Edo state. Odili and Okwuanasor reported that diagnostic cost was the highest at 7,517.0±7655.3 naira which is equivalent to 37.7 US Dollars. This difference might be because most of the respondents of the mentioned study were just diagnosed which was not the case in this study. Respondents who participated in this study were being monitored and routinely requested to undergo one test or the other and were permanently on prescribed medications.

It was also documented that majority (63.8%) respondents identified hypertension as the other health challenge they are suffering from as a result of diabetes. This is finding is similar to the findings from a study conducted among DM patients in two tertiary hospitals in Imo state (Adogu, Chineke, Ewuzie, Enwere and Egenti 2015) and the results of the study by Shal and Afzal (2013) conducted in Pakistan. It was obtained from both studies that hypertension was found to be the most common co-morbidity with 45.6% reported from the Nigerian study and 32.7% for the study done in Pakistan.

5.4.1 Indirect cost of diabetes mellitus

This study showed that respondents visit hospital for care of their condition often. In fact, majority (80.2%) of respondents had visited the hospital at least once in the month preceding the study. This is a positive health seeking behaviour which should be promoted among diabetic patients as the habit helps to prevent associated complications. It was also reported that nearly half (49.3%) of respondents spent at least 31-60 minutes to get to the hospital. This item has potential for affecting the health-seeking behaviour and productivity of respondents in terms of work and other engagements.

The time lost while waiting to receive one service or the other is another burden of the disease. Few respondents stated that they were accompanied by someone to the hospital for care. Of this proportion more than half were employed. The implication of this is that cost of transportation will probably double for these set of respondents in that cost of transportation

should be considered for the patient and the person who accompanied the patient to the health facility for care also productivity will be adversely affected. Similarly, nearly half (48.8%) of respondents spent between 2-4 hours each time they come to the hospital for one reason or the other. Time lost this way leads to absenteeism which is a major indicator of indirect cost. These measures (such as absenteeism, reduced productivity) are in line with what was obtained from measures highlighted by Kirigia et al. (2009), Chatterjee et al. (2011) , Giwa and Tayo (2014) and WHO (2015). Fu, Qiu, Radican and Wells (2009) have reported that absenteeism is greatly associated with diabetes mellitus. The actual measurement of the indirect cost of DM could be problematic. This is so because it is difficult to accurately quantify it in monetary terms. WHO (2015), had recently stated that *"Estimating the cost to society of this loss of productivity is not easy"*. In addition, over-reporting or under-reporting adversely affects the estimation of indirect cost.

5.5 Health seeking behaviour of respondents

Generally, respondents had good health seeking behaviour in that majority adhered to practices that encourage better management of their condition. In this study, majority (76.8%) reported that they took their medications every day. This is similar to the study conducted by Ogbonna, Ogbonna, Ejim, Uzodinma, Soni and Oparah (2015) among DM patients in a tertiary hospital in Nigeria. Ogbonna et al (2015) noted that 73.5% of the respondents reported that they took their medications every day. Most (96.1%) of the respondents in this study reported that they meet hospital appointments, a practice which Adibe, Aguwa, Ukwe, Okonta and Udeogaranya (2009) also reported in the study conducted by them among diabetic patients in South-East Nigeria. Majority (75.0%) who could not meet up with appointments cited financial constraints as a major reason. A reason such as this was reported by Yusuf, Obe, and Joseph, (2008) in their study conducted among type 2 DM patients in UCH, Ibadan.

Most Respondents who participated in this study all sought for help solely from professionals; primarily, from health care staff in public health facilities (primary, secondary or tertiary) or private health care facilities. This is congruent with findings reported by Hjelm and Atwine (2011) in their study conducted in Uganda among persons living with diabetes.

This might be due to the favourable perception of the respondents about the severity of the disease. Respondents who reported that they sought for help from other facilities apart from the study location might have done for a variety of reasons which include incessant strikes by hospital workers and lack or inadequate financial resources.

Majority (75.8%) reported that they own a glucometer. This is indicative of the practice of self-care or self-monitoring of sugar level in the blood by respondents. When used effectively, a glucometer can provide DM patients with a warning sign in terms of when the blood sugar level is too high or too low.

Majority (87.4%) of the respondents had good health seeking behaviour. This could be due to a lot of factors such as the knowledge level of respondents about the disease which has been shown to be good. Another factor that could have aided the good behaviour of individuals towards their health is the financial aspect. Inferential statistics showed that the mean direct cost was higher among the few respondents who had poor health seeking behaviour while it the cost was lesser among those with good health seeking behaviour. Therefore, affordability of services and cost related to the treatment of DM is could influence how patients seek for care.

5.6 Implication for Health Promotion and Education

The findings of this study have implications for health promotion and education. Some of the challenges identified in this study were unfavourable perception relating to the social burden of diabetes mellitus and loss of productivity. The huge out-of-pocket expenditure among respondents as well as the huge time lost while waiting to receive care in health care facilities. Health promotion and education strategies can be used to tackle some of the challenges identified in this study. Possible health promotion strategies that can be used include social support, training and advocacy. These strategies will be discussed one by one starting with social support.

Social support

Social support include physical and emotional comfort shared by family members, friends, co-workers, and significant others. Social support involves emotional, instrumental, appraisal and informational support. Emotional support refers to demonstrations of love and caring, esteem and value, encouragement, and sympathy (Thoits, 2012) while instrumental support

involves provision of tangible aid and services such as gifts of money, moving furniture, food, assistance with cooking, or child care that directly assist a person in need (Heaney and Israel, 2008). Social support is said to be appraisal when there is provision of information for self-evaluation purposes which is also constructive feedback and affirmation (Heaney and Israel, 2008). Informational social support entails provision of facts or advice that may help a person solve problems (Jack, Grim, Gross, Lynch and Mclin, 2010). Social network of diabetic patients which include significant others such as friends, spouse, children and siblings can provide support for patients in terms of love and care to help patients manage the stress from the disease (Thoits, 2012).

Social support could be important in providing tangible aid to diabetic patients in form of money to help with direct cost associated with the disease and assistance with work (Ozbay, Johnson, Dimoulas, Morgan, Charney and Southwick, 2007) that could exacerbate the disease condition. Friends and relatives could also be beneficial in reinforcing some of the vital information relating to the disease. For example, relatives, friends or the spouse could advice a patient on the importance of daily exercise, dietary intake and adherence to clinical appointments. Finally, the social network of diabetic patients could be important in providing information that is useful for self – evaluation purposes. The diabetic association is a major social network of DM patients and could provide social support by improving on the follow-up of and overall welfare of patients. The association could also help in attracting pharmaceutical companies to sell diabetic drugs at a lesser price compared to what is available on the market.

Training

Diabetic association officials at the facility level could be trained by trained experts from the federal ministry of health or the state ministry of health to help in sustaining or improving on the good knowledge of diabetic patients noted in this study. The reason why the association officials are important in this regard is as a result of the influence they have over other diabetic patients. This may be because the association is one of the strongest support groups around. To this end, a training curriculum could be designed to facilitate the training. Training could be in form of seminars, workshops or conference. The association officials that have been trained can then conduct a step-down training for their members. This will go

a long way in sustaining the gains that have been made in terms of knowledge and inadequacies that remains.

Health workers handling diabetic patients in health facilities can be trained on how to manage time and be effective at the same time. For example, health workers at the Records Department could be taught better ways to make documentation faster. Methods such as improved electronic documentation could be employed to reduce waiting time at that department.

Advocacy

The reported long waiting time at the clinic which leads to loss of productivity could be addressed through advocacy. Advocacy involve actions designed to generate policies and gain support for a particular health goal. This is often aimed at defending a group of people or improvement of their status (Obar, Zube and Lampe, 2012). Advocacy could be done through methods such as media advocacy and lobbying by interest groups (e.g. non-governmental organisations and civil groups). This will be important in formulating and implementing policies targeted at reducing waiting time at health care facilities. The advocacy effort should target policy makers who influence decisions (such as the Minister for health, commissioner for health, lawmakers heading health committees, leadership of health facility management boards etc.). This could be done by making advocacy visit to these individuals; the problem of waiting time in hospital will be explained and the need for policies could be highlighted. A sustained health campaign through media outlets such as radio, television and even the internet could be useful in bringing to light the problem to the notice of policy makers. As a result, appropriate pressure on relevant stakeholders in the health sector could yield the necessary patient-friendly policies which will be helpful in reducing waiting time at health care facilities.

5.7 Conclusion

The study investigated the knowledge, perception, economic cost and health seeking behaviour relating to DM among patients attending University College Hospital, Ibadan. Oyo state. The level of knowledge was generally good, though findings revealed that there were some gaps in respondents' knowledge relating to the disease. it was shown in this study that

more than half of the respondents did not know or disagreed that routine eye test was one of the tests used in preventing complications of DM. Findings from this study also showed that more respondents did not know or agree with the notion that alcohol consumption is a measure used in preventing complications of DM. The proportion of respondents with good knowledge was more among those that were married than any other group under marital status and findings also showed a significant relationship with knowledge. Participants of this study showed favourable perception but were not clear about the enormity of the social burden of diabetes and effects of the disease on productivity.

The assessment of the direct cost to respondents reveals that DM is an expensive disease to treat especially in a depressed economy such as that of Nigeria. The indirect cost of diabetes is equally a serious burden of the disease. The huge amount of time expended on seeking for care is a serious challenge to the patients and their relatives. Generally, patients had good health seeking behaviour. This is a practice that should be sustained through the use of a variety of health education strategies.

5.8 Recommendations

1. The direct and indirect cost of diabetes mellitus is huge. Many patients managing this disease cannot afford to take care of themselves alone. Social support is one strategy that should be used to enable patients get one form of assistance or the other. Relatives and significant others could help with this as well as support groups in the health facilities.

2. Health education strategies such as patient education and clinic-based counselling are needed to address the gaps in knowledge relating to DM among the respondents. They can also be used to tackle the identified unfavourable perceptions relating to DM.

3. Health promotion and education strategies such as advocacy and training should be used to enhance the capacities of health service providers to reduce waiting time in hospitals. The advocacy could be targeted at policy makers to help design policies that will compel health workers to deliver fast and efficient services to patients. Training could be used to upgrade the knowledge of health workers by exposing them to new and better techniques of patient management.

4. The importance of routine clinical monitoring of DM patients through the conduct of tests should be stressed or made known to patients as part of counselling services provided to patients. This is more so because it has potential for purging DM patients of the perceived burden associated with being treated every now and then.

5. In a resource constrained country like Nigeria, efforts should be made by the government to encourage other forms of cost coverage such as insurance schemes and affordable medical plan. In primary health care facilities, use of other modes of payments such as payment with farm produce could be looked into as it will go a long way in ensuring care of population living with diabetes as this will help reduce the burden of cost.

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APPENDIX I

QUESTIONNAIRE (ENGLISH VERSION)

KNOWLEDGE, PERCEPTION, ECONOMIC COST AND HEALTH SEEKING BEHAVIOUR RELATING TO DIABETES MELLITUS AMONG PATIENTS ATTENDING UNIVERSITY COLLEGE HOSPITAL, IBADAN. OYO STATE.

Good day sir/madam. My name is Adetunji Adetayo a post-graduate student at the University of Ibadan Department of Health Promotion and Education, Faculty of Public Health. Presently, I am carrying out a research work titled: knowledge, perception, economic cost and health seeking behaviour relating to diabetes mellitus among patients attending University College Hospital, Ibadan. Oyo state. I request your permission to participate in the study, your participation is voluntary and honest responses will be greatly appreciated.

All information obtained from you will be treated privately and confidentially. The knowledge gained will contribute to efforts focused on the reduction of the burden of diabetes

Instruction: Please kindly indicate by ticking the appropriate box below to indicate or show your willingness to participate or not. Would you like to participate? Yes ☐ No ☐

Serial no_____ Date_____

SECTION A: SOCIAL DEMOGRAPHIC CHARACTERISTICS

Please tick (√) any of the response that apply to you in the boxes ☐ provided or complete the blank spaces provided as applicable.

1. Gender 1 Male ☐ 2 Female ☐
2. Age (as at last birthday) (in years) _____
3. Level of education 1.No formal education ☐ 2. Primary education ☐
   3. Secondary education ☐ 4.OND ☐ 5. HND ☐ 6.NCE ☐ 7.B.Sc ☐
   8. Postgraduate ☐
4. Occupation (1) Civil Servant ☐ (2) Trader ☐ (3) Retired ☐
   (4) Others (Specify) _____
5. Other supplementary sources of income (i.e. from all sources) _____
6. Average monthly income (in naira) _____
7. Marital Status 1. Single ☐ 2. Married ☐ 3.Divorced ☐ 4.Widowed ☐
   5. Separated ☐ 6.Cohabiting ☐
8. Ethnic group 1. Yoruba ☐ 2.Hausa ☐ 3. Igbo ☐
   4 others (specify) _____
9. Religion 1. Christianity ☐ 2 Islam ☐ 3 Traditional ☐
   4. others please specify_____
10. How long have you had diabetes? (in years) _____

SECTION B: KNOWLEDGE OF PATIENTS ON DIABETES

Please tick (√) 'Yes', 'No' or 'Don't know' for the responses corresponding to the questions listed below or or complete the blank spaces provided as applicable.

S/N	Question	Response	Tick (√) one		
			True	**False**	**Don't Know**
11	What are the risk factors of diabetes?	(a) Old age			
		(b) Heredity			
		(c) Obesity			
		(d) Sedentary lifestyle/Lack of physical exercise			
		(e) High consumption of sugar			
		(f) Too much alcohol consumption			
		(g) Malnutrition (not eating well)			
		(h) Supernatural forces			
		(i) Others (please specify) _____			

12	What are the symptoms of diabetes?	(a) Excessive thirst			
		(b) Frequent Urination			
		(c) Tiredness			
		(d) Rashes			
		(e) Sign of fainting/Collapsing			
		(f) Vomiting			
		(g) Delay in healing of wounds			
		(h) Others (please specify) _____			
13	What are the measures that can be used to prevent complications of diabetes?	(a) Regular physical exercise			
		(b) Adherence to recommended dietary/food intake			
		(c) Checking of blood sugar level			
		(d) Eye test			
		(e) Adherence to recommended drug prescription			
		(f) Go for follow-up care as recommended by health care providers			
		(g) Avoiding alcohol intake			
14	What are the health problems that could result from diabetes?	(a) Hypertension			
		(b) Blindness/Not seeing clearly			
		(c) Leg Ulcers			
		(d) Kidney failure			
		(e) Cancer			
		(f) Heart problems			
		(g) HIV/AIDS			

15	Which test can be used to find out whether someone has diabetes or not?	(a) Urine examination			
		(b) Blood sugar test			
		(c) Stool examination			
		(d) Chest examination			
		(e) Eye test			
16	Glucometer is a medical device used for home blood glucose monitoring by people living diabetes				

17. Which of the following statements is true about the appropriate dietary habit for a diabetic patient (please tick (√) the one that is appropriate)

a. A diabetic patient can take all kinds of food in any amount ☐
b. A diabetic patient can take all kinds of food but in small amount ☐
c. A diabetic patients should only take special food ☐
d. A diabetic patient should always skip meals as a way of controlling the disease. ☐

SECTION C: PERCEPTION OF PATIENTS

Please indicate your answer by ticking (√) the appropriate answer

18 General perception relating to diabetes

S/N	Statement	Tick (√)one		
		Agree	**Disagree**	**Undecided**
18.1	People living with diabetes should eat all kinds of food to get well and stay healthy			
18.2	Diabetes is not a serious health challenge			
18.3	Diabetes is a disease that can be treated			
18.4	Strict adherence to recommended drugs alone is necessary to prevent complications of diabetes mellitus			
18.5	Diabetes is a disease that can be cured			
18.6	Complications can arise from diabetes if it is not well controlled			

Please indicate your answer by ticking (√) the appropriate answer

19 Perception of cost of management of diabetes

S/N	Statement	Tick (√)one		
		Agree	**Disagree**	**Undecided**
19.1	The drugs prescribed at the hospital are too expensive to purchase			
19.2	The recommended food/diet for people with diabetes is too expensive to prepare everyday			
19.3	Amount spent on diabetes management by patient is quite affordable			
19.4	Self-management of diabetes is a better option than clinical care because of cost.			
19.5	Having a personal glucometer is not necessary because of the cost.			

Please indicate your answer by ticking (√) the appropriate answer

20.0 Perception of social burden of Diabetes Mellitus

S/N	Statement	Tick (√)one		
		Agree	**Disagree**	**Undecided**
20.1	It is expensive to prepare my food separately from that of family members.			
20.2	Diabetes make one a big burden or problem in the family.			
20.3	Having diabetes in a particular household affects the emotional health of family members.			
20.4	Diabetes could affect the plans of the family.			

Please indicate your answer by ticking (√) the appropriate answer

21.0 Perception relating to Productivity.

S/N	Statement	Tick (√)one		
		Agree	**Disagree**	**Undecided**
21.1	Diabetes limits the number of working hours of sufferers			

21.2	Diabetes makes one less productive			
21.3	Diabetes restricts the type of jobs sufferers can engage in			
21.4	Diabetes management makes sufferers absent themselves from work occasionally			

SECTION D: DIRECT AND INDIRECT COST OF DIABTES

Please tick (√) any of the response that apply to you in the boxes ☐ provided or complete the blank spaces provided as applicable.

DIRECT COST

22. Approximately how much do you spend on diabetes management with special refence the following?
    a. Transport to and from the health facility per vist to the hospital (₦) _____
    b. Recommended diet per week (₦) _____
    c. **Diabetes Drugs;**
       Insulin injection per month (₦) _____
       Oral agents/medications per month (₦) _____
    d. **Tests;**
       Blood sugar per visit to the clinic (₦) _____
       $HbA1_c$ (Haemoglobin test) (₦) _____
       Lipid profile (₦) _____
       Blood pressure check per visit to the clinic (₦) _____
       BMI per visit to the clinic (₦) _____
    e. Consultation fee per visit to the clinic (₦) _____
    f. Other charges (please specify) (₦) _____
23. Do you have other health problems as a result of diabetes? 1) Yes ☐ (2) No ☐ (3) Don't know ☐ (*If yes go to Q24, if no go to Q26*)
24 Mention the health problems or challenges referred to in question 23_____
25. Approximately how much have you spent to manage the health problem(s) together with diabetes in the last one month? _____

INDIRECT COST

26. How many days have you visited the clinic for your diabetic condition in the last one month? _____
27. What form of transportation do you take to the hospital? _____
28. How many hours does it take you to get to the hospital from your place of residence? _____
29 Does anyone accompany you to the hospital when you are attending the diabetes clinic? (1) Yes ☐ (2) No ☐ *(If yes go to Q30, if no go to Q31*)
30 If yes, is he/she employed? (1) Yes ☐ (2) No ☐ (3) Don't Know ☐
Q31 For employed or self-employed respondents, Skip to Q32 for unemployed
31. How often are you absent from work because of diabetes? (1) Always ☐ (2) Occasionally ☐ (3) Rarely ☐

32. How many minutes do you spend on average before you are attended to and how many minutes does the whole process take?
Card _____Tests_____Waiting to see the doctor_____
Consultation_____Dispensary of drugs_____
Total time_____

SECTION E: HEALTH SEEKING BEHAVIOUR OF DIABETES PATIENTS

Please tick (√) any of the response that apply to you in the options provided or complete the blank spaces provided as applicable.

33. Are you earning enough to help you manage your condition well? (1.) Yes ☐ (2.) No ☐ (3.) Don't know ☐
34. How often do you take diabetic drugs in a week? (1) Once ☐ (2) Twice ☐ (3) Thrice ☐ (4) More than Three times ☐ (5) Everyday ☐
35. How often do you visit hospital for care of your diabetic condition? (1) Once in a week ☐ (2) Twice in a month ☐ (3) More than two times in a month (4) Monthly ☐ (5) More than one month ☐ (6) any other please specify _____
36 Do you meet up with hospital appointments? (1.) Yes ☐ (2.) No ☐
37. If no, why? _____
38. Where else do you seek for care apart from your usual hospital? (1) PHC Center ☐ (2) Private Hospital ☐ (3) State owned hospital ☐ (4) Faith-Based ☐ (5) None ☐
39 a. Do you have a glucometer? (1.) Yes ☐ (2.) No ☐
b. If yes, do you know how to use it? ? (1.) Yes ☐ (2.) No ☐
c. If no, who helps you to use it at home? (1) Husband/wife ☐ (2) Children ☐ (3) Relatives ☐ (4) Friends ☐ (5) others specify_____
40. How often do you make use of the glucometer? (1) Always ☐ (2) Occasionally ☐ (3) Rarely ☐ (4) Don't make use of it ☐
41. Which factors often prevent you from doing the following?
a. Visiting the hospitals for care as expected? _____
b. Taking your drugs as recommended?_____
c. Eating recommended food as expected_____

Thank you for participating

APPENDIX II

QUESTIONNAIRE (Yoruba Version)

IMO, ERO, IYE OWO ATI IHUWASI AYEWO ILERA TI O JOMO ITO SUGA LAARIN ALAISAN TO NWA SI UNIVERSITY COLLEGE HOSPITAL, IBADAN. IPINLE OYO.

A ki yin Sir/Ma. Oruko mi ni Adetunji Adetayo, akeko ni dipatimenti igbega ati eko ilera ti fakuliti ilera awon ara ilu ti ile eko giga yunfasiti Ibadan. Mo n Se iwadi to da lori "**imo, ero, iye owo ati ihuwasi ayewo ilera ti o jomo ito suga laarin alaisan to nwa si university college hospital, ibadan. Ipinle Oyo."** Mo fe beyin fun aiye lati kopa ni nu iwaadi yi. Ikopa yin je atinuwa, idahun ooto yoo je gidigidi abe.

Gbogbo alaye ti a gba lowo yin la ma bo lasiri. Imo la ti iwaadi yi yoo tiwon si akitiyan lojutu lori idinku ti eru ti atogbe.

Itonisona: Jowo fihan ninu apoti to wani sa le yi pe be ni abi be ko boya e faramo lati kopa ninu iwaadi yi Beeni

Beeni ☐ Beeko ☐

IPA A: ALAYE NIPA ARA RE

Jowo ko ami maaki eyikeyi ninu awon esi ti o waye fun nyin ninu awon apoti ti a pese tabi pari ofo awon alafo ti a pese

1. 1. Okunrin ☐ 2. Obinrin ☐
2. Ojo ori ni iye odun (ni ojo ibi to kẹhin) _____
3. Ipo Iwe kika 1. Mi o kawe ☐ 2. Ile iwe alakobere ☐ 3. Ile iwe mewa 4.OND ☐ 5. HND ☐ 6.NCE ☐ 7.B.Sc ☐ 8. Postgraduate ☐
4. Iru ise ti o nse? 1. Ise ijoba ☐ 2.Karakata ☐ 3. Osise feyinti ☐ 4.Awon omiran (so ni pato) _____
5. Owo osooṣu _____
6. Awon orisun owo miiran ti e ni _____
7. Ipo igbeyawo 1. Emi nikan / Mi o gbeyawo ri ☐ 2. Moti gbéyàwó ☐ 3. Ilemoṣu ☐ 4. Opó ☐ 5. Niya ☐ 6. Gbe papo ☐
8. Eya wo ni o? 1. Yoruba ☐ 2. Hausa ☐ 3. Igbo ☐ 4. Awon omiran (so ni pato) _____
9. Esin wo ni o? 1. Kristiẹniti ☐ 2. Musulumi ☐ 3.Esin Ibile ☐ 4. Awon omiran (so ni pato) _____
10. O to igbawo ti o ti ni aisan ito suga? (ni odun) _____

IPA B: IMO NIPA ITO SUGA

Jowo pari ofo awon alofo ti a pese ni isale

S/N	Ibeere	Idahun	Fala (√) si kan		
			Ooto	**Iro**	**Mi o mo**
11	Kini awon okunfa to jemo ilera to le jasi aisan ito suga	(a) Ojo ori Agba			
		(b) Iran de iran			
		(c) Isanraju			
		(d) jijoko lai na ra			
		(e) jije Suga			
		(f) Oti mimu			
		(g) Aijeun de de			
		(h) Ohun ajeji			
		(i) Awon o miran (so ni pato) _____			
12	Ki ni apeere aisan ito suga?	(a) oungbe			
		(b) Ito ni gbogbo igba			
		(c) Rire ara			
		(d) Rashes			
		(e) Ami didaku			
		(f) Ki enyan bi ounje			
		(g) Idaduro iwosan egbo			
		(h) Awon o miran (so ni pato) _____			
13	Ki ni awon ikan ti a le fi dina awon aisan ti o je abajade ito suga ?	(a) Ere idaraya			
		(b) Jije ounje to to dede			
		(c) Yite suga inu eje wo			

		(d) Ayewo oju			
		(e) Lilo ogun bo se to ati bo se ye.			
		(f) Lilo si ile iwosan fun itoju			
		(g) Yiyera fun oti mimu			
14	Kini awon aisan ti o le je abajade arun ito suga?	(a) Hypertension			
		(b) Aisan oju			
		(c) Adaijina ese			
		(d) Aisan kidirin			
		(e) Jejere			
		(f) Aisan okan			
		(g) Arun HIV			
15	Kini awon ayewo ti a fi lemo eni ti o ni aisan ito suga	(a) Ayewo ito			
		(b) Ayewo suga inu eje			
		(c) Ayewo igbe			
		(d) Ayewo aya			
		(e) Ayewo oju			
16	Glucometer je ero ti a file ye suga inu eje wo ni le				

17. Ewo ninu awon koko oro yi lo je ooto nipa ihuwasi ni pa ounje jije (jowo fala (√) si eleyi to dara ju lo)

a. Eni to n se aisan ito suga le je gbogbo ounje ni ye ki ye ☐
b. Eni to n se aisan ito suga le je gbogbo ounje sugbon niwon ba ☐
c. Oniru ounje ti eni to n se aisan ito suga le je ☐
d. Eni to n se aisan ito suga le fo jije ounje lati toju aisan ito suga ☐

IPA C : IRO AWON ALAISON NIPA ITO SUGA

Wonyi ni awon gbolohun ti o ro mo ito suga, so boya o faramo, o ko faramo, abi o ko mo

18 Ero to jo mo gbogbo ikan nipa Ito suga

S/N	Koko oro	Mo Faramo	Mi o faramo	Mi o mo
18.1	Awon to ngbe pelu aisan ito suga gbodo je gbogbo iru ounje lati ni ilera to pe ye.			
18.2	Ito suga je aisan ti o le			

18.3	Ito suga je aisan ti a le sakoso sugbon ko se wosan.			
18.4	Lilo ogun niyanju nikan lo to lati denna ilolu ito suga.			
18.5	Won le wo aisan ito suga san patapata pelu ito suga			
18.6	Ilolu le je abajade aisan ito suga ti won ba bojuto daada.			

Wonyi ni awon gbolohun ti o ro mo owo itojuito suga, so boya o faramo, o ko faramo, abi o ko mo

19 Ero to jo mo owo itoju ito suga

S/N	Koko oro	Mo Faramo	Mi o faramo	Mi o mo
19.1	Ogun ito suga ti won ko fun awon alaisan ni ile iwosan ti won ju lati ra.			
19.2	Ounje ti won ni ki awon to n saisan ito suga ma je ti won ju la ti ma se lojojumo.			
19.3	Iye owo ti wo n na lori aisan ito suga kere gaan.			
19.4	Isakoso ara nipa aisan ito suga daara ju isakoso ni ile iwosan nitori iye owo.			
19.5	Ki eyan ni ero ti won fi n yera wo fun suga ko se koko nitori iye to je			

Wonyi ni awon gbolohun ti o jo mo wahala ti aisan ito suga sokunfa si ebi ati ara, so boya o faramo, o ko faramo, abi o ko mo

20 Ero to jo mo wahala ti aisan ito suga sokunfa si ebi ati ara

S/N	Koko oro	Mo Faramo	Mi o faramo	Mi o mo
20.1	Lati se ounje mi ko yaato si ti awon ti molebi mi nitori aisan yi won.			
20.2	Aisan ito suga je ki eyan je isoro ninu molebi			
20.3	Ito Suga maan je imolara fun awon molebi.			
20.4	Aisan ito suga le da eto ebi ru			

Wonyi ni awon gbolohun ti o jo mo jomo ise awon to ni aisan ito suga, so boya o faramo, o ko faramo, abi o ko mo

21.0 Ero to jo mo ise awon to ni aisan ito suga.

S/N	Koko oro	Mo Faramo	Mi o faramo	Mi o mo
21.1	Aisan ito suga maan sokunfa didinku ninu wakati ise.			
21.2	Aisan ito suga kin je ki eyan sise daada.			
21.3	Oloju ise ti awon alaisan le se nitori aisan ito suga			
21.4	Itoju ara nipa aisan ito suga kin je ki eyan wan i bi se.			

IPA D: IYE OWO ITOJU AISAN ITO SUGA

Jowo ko ami maaki eyikeyi ninu awon esi ti o waye fun nyin ninu awon apoti ti a pese tabi pari ofo awon alafo ti a pese

IYE OWO TO KAN ALAISAN TAARA

22. Bi elo ni o n na lori itoju aisan ito suga nipa awon ikan wonyi;
    a. Owo moto alo ati abo si ile iwosan (₦) _____
    b. Owo ounje (₦) _____
    c. **Ogun Ito Suga;**
       Insulin injection (₦) _____
       Ogun ito suga (₦) _____
    d. **Ayewo;**
       Suga inu eje (₦) _____
       HbA_{1c} (Haemoglobin test) (₦) _____
       Lipid profile (₦) _____
       Ifunpa (₦) _____
       BMI (₦) _____
    e. La ti ri dokita (₦) _____
    f. Awon owo omiran (Jowo so ni pato) (₦) _____
23. N je oni awon aisan omiran nipa aisan ito suga ? (1) Beeni ☐ (2) Beeko ☐ (3) Mi o mo ☐ (*To ba je beeni, lo si Q24, to ba je beeko, lo si Q26*)
24 Daruko awon aisan ti o toka si ni Q23_____
25. Bi e lo ni o ti na lori awon aisan wonyi pelu aisan ito suga ni osu to ko ja? _____

IYE OWO TI O KAN ALAISAN TAARA

26. Ojo melo lo ti lo si ile iwosan fun itoju aisan ito suga ni osu to ko ja? _____
27. Bawo ni o se maan de ile iwosan? _____
28. Wakati melo ni o maan lo ki o to de ile iwosan? _____

29 Se enikeni maan tele e lo si ile iwosan fun itoju?
(1) Beeni ☐ Beeko ☐ *(to ba je beeni, lo si Q30, to ba je beeko, lo si Q31)*

0 To ba je beeni, se eni na je osise? (1) Beeni ☐ (2) Beeko ☐
(3) Mi o mo ☐

Q31 fun awon to n sise, Lo si Q32 fun awon ti o sise

31. Bawo ni o se maan pa ise je si nitori aisan yi? (1) Gbogbo igba ☐
(2) E kan kan ☐ (3) Osowon ☐

32. Iseju melo ni o maan lo ki won to da e loun nipa awon iikan wonyi;
Kaadi_____Ayewo_____diduro lati ri dokita_____
Ijumosoro pelu dokita_____Rira ogun_____
Gbogbo iseju_____

IPA E: IHUWA SI AWON ALAISAN ITO SUGA NIPA ITOJU

Jowo ko ami maaki eyikeyi ninu awon esi ti o waye fun nyin ninu awon apoti ti a pese tabi pari ofo awon alafo ti a pese

33. Se o n pa owo ti oto fun e lati toju ara re nipa aisan yi? (1.) Beeni ☐
(2.) Beeko ☐ (3.) Mi o mo ☐

34. Bawo ni o se maa nlo ogun atako ito suga re si lose? (1) Ekan ☐ (2) Emeji ☐
(3) Emeta ☐ (4) Opoju emeta ☐ (5) Ojojumo ☐

35. Bawo le se nlo si ile iwosan si? (1) Ekan lo se ☐ (2) E meji losu ☐
(3) opoju emeji losu ☐ (4) Osoosu ☐ (5) Awon omiran (so ni pato) _____

36. Se o maan lo si ile iwosan deede ? (1) Beeni ☐ (2) Beeko ☐

37. To ba je beeko, ki nidi? _____

38. Nibo lo tun maa nlo fun itoju yato si ile iwosan yi? (1) PHC Center ☐
(2) Ile iwosan aladani ☐ (3) Ile iwosan ipinle ☐ (4) Igabgbo ☐
(5) Ko si ☐

39 a. N je o ni ero to n fi ye suga inu eje wo (glucometer) (1) Beeni ☐ (2) Beeko ☐
b. To ba je beeni, se o mo lo? (1) Beeni ☐ (2) Beeko ☐
c. To ba je beeko, ta lo n maan ba e lo? (1) Oko/Aya ☐ (2) Awon omo ☐
(3) Awon ebi ati ara ☐ (4) Awon ore ☐ (5) Awon omiran (so ni pato) _____

40. Bawo lo se maa nlo ero iyerawo si? (1) Gbogbo igba ☐ (2) E kan kan ☐
(3) O sowon ☐

41. Ki ni awon nkan ti o je ki o se iwonyi ;

(a) Lo si ile iwosan bo se ye _____

(b) Lo ogun bo se ye_____

(c) Jeun bi o se ye_____

E se pupo

APPENDIX III

Scoring of Knowledge scale

QN	Knowledge Item	Correct response (√)		Assigned score
		True	False	
11	**Risk factors**			
	Old age	√		1
	Heredity	√		1
	Obesity	√		1
	Sedentary lifestyle/Lack of physical exercise	√		1
	High consumption of sugar	√		1
	Too much alcohol consumption	√		1
	Malnutrition (not eating well)		√	1
	Supernatural forces		√	1
12	Symptoms of DM			
	Excessive thirst	√		1
	Frequent Urination	√		1
	Tiredness	√		1
	Rashes		√	1
	Sign of fainting/Collapsing	√		1
	Vomiting		√	1
	Delay in healing of wounds	√		1
13	**Measures that can be used to prevent complications of diabetes**			
	Regular physical exercise	√		1
	Adherence to recommended dietary/food intake	√		1
	Checking of blood sugar level	√		1
	Eye test	√		1
	Adherence to recommended drug prescription	√		1
	Go for follow-up care as recommended by health care providers	√		1
	Avoiding alcohol intake	√		1

14	**Health problems that could result from diabetes**			
	Hypertension	√		1
	Blindness/Not seeing clearly	√		1
	Leg Ulcers	√		1
	Kidney failure	√		1
	Cancer		√	1
	Heart problems	√		1
	HIV/AIDS		√	1
15	**Tests for DM**			
	Urine examination	√		1
	Blood sugar test	√		1
	Stool examination		√	1
	Chest examination		√	1
	Eye test	√		1
16	**Use of glucometer**	√		1
17	**Appropriate dietary habit for a diabetic patient**			
	A diabetic patient can take all kinds of food in any amount			0
	A diabetic patient can take all kinds of food but in small amount	√		1
	A diabetic patients should only take special food			0
	A diabetic patient should always skip meals as a way of controlling the disease			0
Total				36

Categorisation of knowledge score	**Points**	**Code**
Poor	**<18**	1
Fair	**19-24**	2
Good	**>25**	3

36-point scale.

APPENDIX IV

Scoring of Health seeking behaviour scale

QN	Health Seeking Behaviour Item	Response	Assigned score	Highest score per item
34	How often do you take diabetic drugs in a week	Once	1	
		Twice	2	
		Thrice	3	
		More than three	4	
		Everyday	5	5
35.	How often do you visit hospital for care of your diabetic condition	Everyday	10	
		Once a week	10	
		≥Two times	9	
		Twice a month	8	
		Monthly	7	
		Once in two months	6	
		Once in three months	5	
		Quarterly	4	
		Once in six months	3	
		On appointment only	10	10
36.	Do you meet up with hospital appointments	Yes	1	1
		No	0	
40.	How often do you make use of the glucometer	Always	3	3
		Occasionally	2	
		Rarely	1	
		Don't make use of it	0	
Total				19
Categorisation of health seeking behaviour score		**Points**	**Codes**	
Poor health seeking behaviour		0-10	1	
Good health seeking behaviour		11-19	1	

19-point scale

APPENDIX V

Informed consent form for respondents (English version)

Name of investigator: Adetayo ADETUNJI

Name of Institution: University of Ibadan

Title of the Research: Knowledge, Perception, Economic cost and Health seeking behavior relating to diabetes mellitus among patients attending University College Hospital, Ibadan, Oyo state

Greetings, my name is Adetayo ADETUNJI, I am a post-graduate student of the Department of Health Promotion and Education, Faculty of Public Health, University of Ibadan. I am carrying out a research on the *"Knowledge, Perception, Economic cost and Health seeking behavior relating to diabetes mellitus among patients attending University College Hospital, Ibadan, Oyo state".* The information collected during the study will be useful in future as it will contribute to efforts focused on the reduction of the burden of diabetes

Purpose of research: The purpose of this study is to investigate Knowledge, Perception, Economic cost and Health seeking behaviour relating to diabetes mellitus among patients attending University College Hospital, Ibadan, Oyo state**.**

Procedure of the research: you are invited to participate in this study. If you accept to be involved in this study, you shall be asked questions on your knowledge, perception, economic cost and health seeking behaviour as regards diabetes mellitus. The interview will be conducted privately. If you do not wish to answer any of the questions included in the survey, you may ask to move on to another question.

Expected duration of research and of participant(s)' involvement: In total, the respondents are expected to answer the questions at the time of administration of the instrument. The administration of this instrument will last for about 10 minutes.

Risks: There are no risks associated with the research study.

Benefits: Overall, the knowledge gained from this study will contribute to efforts focused on the reduction of the burden of diabetes mellitus

Confidentiality: All information collected will be treated as anonymous. It will not be linked to the respondent in any way.

Alternative to participation: If any one chooses not to participate it will not affect them in any way.

Statement of person giving consent:
Now that the study has been well explained to me and I fully understand the content of the study process, I hereby agree to allow my child/ward to be part of the study.

DATE: _____ SIGNATURE: _____

Detailed contact information including contact address, telephone, fax, e-mail and any other contact information of researcher(s), institutional HREC and head of the Institution.

This research has been approved by the Ethics Committee of the University of Ibadan and the Chairman this committee can be contacted at Biode Building, Room 210, 2nd Floor, Institute for Advanced Medical Research and Training, College of Medicine, University of Ibadan, Ext: 2451, E-mail: uichirc@yahoo.com. In addition, if you have any question about your .

Mr Adetayo Adetunji

Address: Department of Health Promotion and Education, Faculty of Public Health, University College Hospital Ibadan.

08108000806

E-mail: adetunjidiran@gmail.com

Or

Dr. F. O Oshiname

Address: Department of Health Promotion and Education, Faculty of Public Health, University College Hospital Ibadan.

08035001060

E-mail: foshiname@yahoo.com

APPENDIX VI

Informed consent form (Yoruba version)

Iwe ifowoso awon olukopa

Oruko Oluwadi: Adetayo ADETUNJI

Ile-iwe: University of Ibadan

Oruko iwadi: Imo, ero, iye owo ati ihuwasi ayewo ilera ti o jomo ito suga laarin alaisan to nwa si university college hospital, Ibadan. Ipinle Oyo.

Mo ki yin o, oruko mi ni Adetayo ADETUNJI, mo je omo ile-iwe eko giga ti dipatimenti igbega ati eko ilera ti fakuliti ilera awon ara ilu ti ile eko giga yunfasiti Ibadan. Mo nse iwadi lori *"Imo, ero, iye owo ati ihuwasi ayewo ilera ti o jomo ito suga laarin alaisan to nwa si university college hospital, Ibadan. Ipinle Oyo".* Alaye to ba je yo nipa iwadi yi, yio wulo ni ojo iwaju gegebi ipetele alaye lati pero awon agbekale eto lati boju to aisan ito suga

Idi iwadi: yi ni lati se Imo, ero, iye owo ati ihuwasi ayewo ilera ti o jomo ito suga laarin alaisan to nwa si university college hospital, Ibadan. Ipinle Oyo.

Igbese Iwadi: Ti e ba gba la ti ko pa ninu iwadi yi, aa bi yin ni awon ibeere to jomo imo yin, ero yin, owo ti e na fun itoju ati ihuwa yin si itoju gbogbo elyi to jomo aisan ito suga. Iwadi yi ni a o se ni bonkele. Ti eyin ko ba fe lati dahun awon ibeere ti afi si inu iwe ibeere na, e le so fun w ape ki ani so ni awon ibeere miran.

Iye akoko ti alero wipe iwadi naa yi o gba ati ilowosi awon oludahun wa: Gbogbo oludahun yio lo bi iseju mewa ni idiawon ibeere won yi.

Ewu: Ko si ewu ipalara kokan ti o le ti inu iwadi yi wa, sugbon ti awon ibeere kookan ba niyin lara lati dahun, e ni oreofe lati ma dahun awon ibeere na.

Anfani: Ko si anfaani kiakia fun yin sugbin awon alaye ti aba ri gba ninu iwadi yi yio wulo lati se awon agbekale ti yio boju to aisan ito suga

Igbekele: Gbogbo alaye ti a ba ri gba ninu iwadi yi ni ako ni fi oruko si sugbon. Awon idahun yin ko ni se fi lati wadi yin. Ati wipe oruko yin ko ni jade ninu abajade iwadi yi

Atinuwa: Ko pon dan dan fun yin lati kopa ninu iwadi yi ti e ko ba fe, e si le dawo ikopa yin duro nigba ti o ba wu yin.

Oro Ifowosi Lati Enu Olukopa

Ni bayi ti won ti salaye ise iwadi yi fun mi, ti mo si ti ni oye gbogbo ohun ti o wa ninu ise iwadi naa: mo gba lati kopa ninu ise iwadi yii

Date: _____ Sign:

_____

Ise iwadi yii ni awon igbimo to n se akoso ise iwadi ni University Ibadan ti fi owo si. E si le kan si alaga igbimo yii ni Biode Building Room T10, 2nd floor, Institute of Advance Medical Research and Training, College of Medicine, University of Ibadan. Tel.08032397993 E-mail: uiuchirc@yahoo.com. Ni afikun, ti e ba ni ibere kankan lori kikopa ninu ise iwadi yii, e le kan si ;

Mr Adetayo Adetunji
Address: Department of Health Promotion and Education, Faculty of Public Health, University College Hospital Ibadan.
08108000806
E-mail: adetunjidiran@gmail.com
tabi
Dr. F. O Oshiname
Address: Department of Health Promotion and Education, Faculty of Public Health, University College Hospital Ibadan.
08035001060
E-mail: foshiname@yahoo.com

APPENDIX VII

Ethical Approval

INSTITUTE FOR ADVANCED MEDICAL RESEARCH AND TRAINING (IAMRAT)
College of Medicine, University of Ibadan, Ibadan, Nigeria.

Director: **Prof. Catherine O. Falade,** MBBS (Ib), M.Sc. FMCP, FWACP
Tel: 0803 326 4593, 0802 360 9151
e-mail: cfalade@comui.edu.ng lillyfunke@yahoo.com

UI/UCH EC Registration Number: **NHREC/05/01/2008a**

NOTICE OF FULL APPROVAL AFTER FULL COMMITTEE REVIEW

Re: Knowledge, Perception and Economic Cost relating to Diabetes mellitus among patients attending the University College Hospital, Ibadan, Oyo State

UI/UCH Ethics Committee assigned number: UI/EC/15/0196

Name of Principal Investigator: **Adetayo Adetunji**

Address of Principal Investigator: Department of Health Promotion & Education, College of Medicine, University of Ibadan, Ibadan

Date of receipt of valid application: 09/07/2015

Date of meeting when final determination on ethical approval was made: **20/08/2015**

This is to inform you that the research described in the submitted protocol, the consent forms, and other participant information materials have been reviewed and *given full approval by the UI/UCH Ethics Committee.*

This approval dates from **20/08/2015 to 19/08/2016.** If there is delay in starting the research, please inform the UI/UCH Ethics Committee so that the dates of approval can be adjusted accordingly. Note that no participant accrual or activity related to this research may be conducted outside of these dates. *All informed consent forms used in this study must carry the* UI/UCH EC *assigned number and duration of* UI/UCH EC *approval of the study.* It is expected that you submit your annual report as well as an annual request for the project renewal to the UI/UCH EC early in order to obtain renewal of your approval to avoid disruption of your research.

The National Code for Health Research Ethics requires you to comply with all institutional guidelines, rules and regulations and with the tenets of the Code including ensuring that all adverse events are reported promptly to the UI/UCH EC. *No changes are permitted in the research without prior approval by the* UI/UCH EC *except in circumstances outlined in the Code. The* UI/UCH EC *reserves the right to conduct compliance visit to your research site without previous notification.*

UI/UCH EC APPROVED

Professor Catherine O. Falade
Director, IAMRAT
Chairperson, UI/UCH Ethics Committee
E-mail: iruchec@gmail.com

Research Units • Genetics & Bioethics • Malaria • Environmental Sciences • Epidemiology Research & Service • Behavioural & Social Sciences • Pharmaceutical Sciences • Cancer Research & Services • HIV/AIDS