ECONOMIC BURDEN, PAYMENT STRATEGIES AND PAYMENT COPING MECHANISM AMONG TYPE2 DIABETIC PATIENTS ATTENDING A TERTIARY HEALTH INSTITUTION IN ABIA STATE, SOUTH EAST NIGERIA

BY
EKPEMIRO, J. N
REGISTRATION NO: PG/MSC/07/47026

DEPARTMENT OF NURSING SCIENCES
FACULTY OF HEALTH SCIENCES AND TECHNOLOGY
UNIVERSITY OF NIGERIA
ENUGU CAMPUS

JULY, 2014.

ECONOMIC BURDEN, PAYMENT STRATEGIES AND PAYMENT COPING MECHANISM AMONG TYPE2 DIABETIC PATIENTS ATTENDING A TERTIARY HEALTH INSTITUTION IN ABIA STATE, SOUTH EAST NIGERIA

BY
EKPEMIRO, J. N
REGISTRATION NO: PG/MSC/07/47026
M.SC RESEARCH DISSERTATION,

PRESENTED TO
THE DEPARTMENT OF NURSING SCIENCES, FACULTY OF HEALTH SCIENCES AND TECHNOLOGY, UNIVERSITY OF NIGERIA ENUGU CAMPUS

IN PARTIAL FULFILLMENT FOR THE AWARD OF MASTER OF SCIENCES DEGREE IN NURSING

SUPERVISOR: DR (MRS) OKORONKWO, I. L

JULY, 2014.

APROVAL PAGE

This is to certify that approval has been given to this dissertation titled ñEconomic burden, Payment Strategies and Payment coping Mechanisms among Diabetic Patients attending a Tertiary Health Institution in Abia State, South- East Nigeriaò for the award of Master of Science degree in Nursing sciences to Ekpemiro, Jessie Nwasoka, Registration Number PG/MSC/07/47026 of Department of Nursing Sciences, Faculty of Health Sciences and Technology, University of Nigeria Enugu Campus.

_____ _____

Dr, (Mrs.) Okoronkwo, I.L Date
(Supervisor)

_____ _____

Dr. (Mrs.) Okolie UChe Date
(HOD, Department of Nursing Sciences UNEC)

_____ _____

Prof. Onwujekwe, O.E Date
(Dean Faculty of Health Sciences and Technology UNEC)

_____ _____

External Examiner Date

CERTIFICATION

This is to certify that this Project is original work by EKPEMIRO, JESSIE .N, Department of Nursing sciences, University of Nigeria Enugu Campus.

_____ _____

Ekpemiro J.N Date

Student

_____ _____

Dr. (Mrs.) Okoronkwo, I.L Date

Supervisor

DEDICATION

This Project is dedicated to the most High God who gave me the grace to go through this programme.

ACKNOWLEDGEMENT

My gratitude is to God Almighty who sustained me throughout the period of working on this project. I immensely appreciate my painstaking supervisor Dr. (Mrs.) Okoronkwo, I.L for her kind guidance throughout this training period and her diligence in supervising this work.I am indebted to Prof. Onwujekwe and Dr. (Mrs) Anarado A.N for their kind heartedness in validation of the instrument, reading and correcting this project despite their tight schedules.

I am thankful to the P.G co-ordinator Dr. (Mrs) Ehiemere, I.O and all the lecturers in the Department of Nursing for their diligence in teaching, reading and correcting this work.I heartily appreciate my husband, Dr. U.C Ekpemiro and my precious children especially Ekpemiro Chinedum Sopuruchi for their profound motivation, support, prayers, sourcing literature and typesetting most of the preliminary aspects of this project. I am very thankful to my sisters and friends, Ednah Okwor, Hope Opara, Chineme Chukwudi, Ugochi Onuoha, Dr & Dr (Mrs) Caleb Ezeano and Ego Okam for their encouragement to continue and complete this programme, constructively critiquing this work, assisting in computer work, sourcing for competent analyst and prayer support.

I also appreciate Dr. (Mrs.) Pat. Okpala and her household for their wonderful prayer support and hospitality throughout this programme, God will never forget your labours of Love which you wrought on my account.

I am grateful to my Research Assistants: Anyanwu, Lilian, Onuigbo Elizabeth and Sis Kem O for their wonderful commitment and sacrifice during the data collection period.I am sincerely grateful to the Management Board of FMC Umuahia for the opportunity given me to complete this programme. May each and every one of you be blessed.

TABLE OF CONTENTS

LIST OF TABLE

ABSTRACT

Diabetes is a chronic life- long illness that affects the quality of life, requiring close monitoring and control. Diabetics have high risk for high economic burden (direct and indirect health costs) and catastrophic expenditure where healthcare costs are paid out of pocket. This study determined the economic burden and assessed the payment strategies and payment coping mechanisms of type 2 diabetic patients attending Out- Patient Department of Federal Medical Centre (FMC) Umuahia, Abia State, South East Zone, Nigeria, July, 2011 to June, 2012. Literature were reviewed global and in Nigeria using the Cost- of- illness (COI) framework. Five objectives guided the study and three hypotheses were tested at 0.05 level of significance using Chi-square statistics. Cross-sectional descriptive survey design was used to study a sample of 308 diabetics selected from Population of 1224 type2 Diabetic patients managed at FMC Umuahia. The instrument for data collection was the questionnaire. Reliability of the instrument determined with Cronbach alpha method which yielded a coefficient of 0.40, 0.80, 0.75 and 0.68 sections A- D respectively. Data were analysed using descriptive and inferential statistics and presented in frequencies, percentages, means and standard deviation. The major findings were direct cost of type 2 DM of ₦52,104.28 and indirect cost of ₦139,659.60. The mean monthly catastrophic type 2 diabetic costs in this study were direct cost 20.35%, indirect cost 54.55% and overall catastrophe of 37.45%. Diabetics from all socio-economic status group suffered catastrophic expenditure at 40%, 30% and 10% non-food expenditure, but the poorest socioeconomic status group had the highest incidence. At 40% threshold catastrophic expenditure by socio economic status were 44.6%, 27.4%, 17.8% and 13.9% poorest (q1) to the least poor (q4) respectively. At a variable threshold of 10% for the poorest and 30% for the least poor the catastrophic costs were 83.8% and 36.1% respectively. Private funding (Out of Pocket spending and instalment payment) were the major payment strategies used. The major payment coping mechanisms used were own money (earmarked savings and earnings), behavioural payment coping mechanisms (instalment purchase of drugs) and social support (family and friends paid). There was significant relationship between socio-economic status and catastrophic type 2 DM costs ($p < 0.05$). Social support (community based insurance), health insurance and prepayment, disposal of assets, community based support and cost saving/evading behaviours were significantly related to socio-economic status of the respondents. It was concluded that the economic burden of type 2 DM is high and that people living with type 2 DM pay using private funds and incur catastrophic expenditure. In order to reduce catastrophic expenditure, policies that will make services free at the point of delivery are advocated. This will reduce incidence of DM complication, morbidity and mortality from type 2 DM as well as reduce productivity losses.

CHAPTER ONE

INTRODUCTION

Background to the Study

Diabetes mellitus (DM) is a group of chronic medical condition in which the body metabolism is deranged either due to none or insufficient production or the body does not properly respond to insulin; a hormone produced by the beta cells of islets of Langahans in the pancreas (Adebayo, 2009). Insulin enables cells to absorb glucose in order to turn it to energy. DM interferes with the intermediary metabolites as a result of absolute or relative deficiency of Insulin, producing a persistent hyperglycaemic state. The persistent hyperglycaemia demands intensive care thus increasing the cost of care. Diabetes mellitus is a growing ñepidemic and pandemicò (WHO, 2002; Adebayo, 2009). WHO, (2008) estimates that more than 180 million people worldwide have diabetes in 2008 and in 2009, the prevalence rose to 246million. Globally, 285million people had DM in 2010, projected to double by 2030 (Bilikis, 2012). A diabetes prevalence of 20.8million (7% of population) for Nigeria is considered high (Kiriga and Barry 2008; Odeleye 2008) and Nigeria having the largest prevalence of DM in African region in 2011 (International Diabetes Federation IDF, 2012) is a concern.

Diabetes affects the quality of life of individuals/families; having a 5-fold risk of cardio-vascular diseases and 3-fold of stroke. It is the third cause of death from disease and complications (Ikheiemoje, 2006; Smeltzer, Bare, Hinkle & Cheever 2008) and the second of the 4 killer Non communicable diseases (Sridhar, 2011). Diabetes affects all socio-economic groups but the low income groups are more affected (Smeltzer, et al. 2008). In Nigeria and other Sub-Saharan Africancountries,the active productive age groups (30-45years) are mostly affected (Azevedo & Allai, 2008; Obayendo, 2008). Type2 diabetes which used to be of adult onset is occurring much earlier due to obesity and lifestyle changes. Studies have shown

that the earlier the onset of diabetes, the earlier the onset of complications with consequent higher direct and indirect cost of care (economic burden) (Ikhesiemoje, 2006; Smeltzer et al. 2008; Idemyor, 2010).

Economic impact of healthcare expenditure on individuals challenged with illness especially where prepayment system is absent is a growing concern (Xu, et al. 2007; Onoka, Onwujekwe, Hanson & Uzochukwu, 2010). This could be worse for patients with Diabetes Mellitus, a chronic metabolic disorder requiring life-long treatment. The medical costs for diabetics are high because they visit the health facilities 2-3 times more than non-diabetics (Chang & Javitt, 2000). Diabetic patients incur increasing costs of care paid out of pocket and absents from work often (Zhang, et al. 2010) (indirect cost).

D.M exerts a heavy burden on individual and society in terms of increasing healthcare costs. The burden borne depends on the purchasing power of individuals, social insurance policies of the nation they live (Zhang, et al 2010) and amount of care received (IDF, 2005). WHO, (2005) postulated that where health care is funded privately, individuals lack ability to pay and there is no mechanism to pool financial risk as in Nigeria, catastrophic spending is high. Catastrophic Healthcare expenditure is very high healthcare spending beyond which individuals begin to sacrifice consumption of basic needs. It is equal to or in excess of 40% of non-subsistence income consumption (WHO, 2005); that is income available after basic needs have been met (non food expenditure) but countries could set their thresholds based on their peculiarities. In Nigeria private funding is more than 90%. More than 70% of the population live below $1 a day and prepayment mechanism for pooling risk is lacking (Soyibo, 2004; WHO, 2005; UN Report 2006; Onwujekwe, et al. 2009). Diabetics in Nigeria have high risk for catastrophic expenditure not only because they visit the health facilities 2 to 3 times more than non diabetics but most times present late with complications, pay out of pocket (OOPS) and healthcare cost is increasing. Excessive reliance on OOPS

exacerbates the already inequitable access to quality care and exposes households to the financial risks of expensive illnesses like DM (Soyibo, 2004). High cost of care force individuals to adopt payment coping mechanisms which are short term strategies used to cope with the costs of healthcare (Adams & Ke, 2008). It has also been recognised that financing healthcare with payment coping mechanism further increases the total cost and generates óhiddenô poverty (Adams & Ke, 2008; Oyakale & Yusuf, 2010).

The economic importance, complications and death tolls are compelling national governments to pay more attention to the impacts of D.M (Azevedo & Allai, 2008; Cummings 2010; Sridhar, 2011). Diabetes mellitus is one of the priority Non Communicable Diseases(NCDs) discussed by the United Nations General Assembly, September, 2011, because of its recognised health, economic and development importance. Nigeria lost to these, 4.5million in human resources in 2009 (Osotimehin, 2009), loses about $400 million per annum in national income from premature death (WHO, 2010) and incurs direct costs of about $800 million annually (Chukwu, 2011) posing a major challenge to the actualisation of sustainable development in the 21st century, especially in developing countries with consideration to their rates of morbidity and mortality.

Although Nigerian government provided exemption for treatment of malaria in under-5s and pregnant women (Federal Ministry of Health, 2003), there is no exemption for diabetes; a growing epidemic with largely increasing healthcare costs especially with its late diagnosis in Nigeria and some other Sub Saharan African countries. The problems of living with diabetes are most acutely experienced by patients and their immediate families (Adams & Ke, 2010), who also provide 95% the care (IDF Clinical guidelines Task Force, 2005). They experience the greatest impact of lifestyle changes that directly affect their quality of life. Evidenced-based data is needed to move D.M into the national health policy agenda for targeted intervention. Unfortunately, there is paucity of data on the magnitude of the economic burden

borne by diabetic Patients, their payment strategies and payment coping mechanisms in Nigeria. There is therefore need to ascertain the economic burden borne by diabetic patients and payment coping mechanisms from people who are experiencing the illness and incurring the costs (Willen & Willkie, 2006). This study therefore investigated the economic burden, payment strategies and payment coping mechanisms of diabetic patients attending a tertiary health institution in Abia State, South-East Nigeria.

Statement of the Problem

DM Type2 is preventable and controllable but increasing healthcare cost is a major challenge in accessing quality health care in Nigeria(Soyibo, 2009). Every year more than 150 million individuals face financial catastrophe and more than 100 million individuals are pushed into poverty as a direct result of paying for health care (Xu et al. 2007). This could be worse for diabetic patients in Nigeria who not only require life- long treatment, make frequent visits to the health facilities but the three conditions that predicts financial catastrophe are prevalent in Nigeria; (Healthcare paid out of pocket (90%) (Soyibo 2009), poverty (70%) (UN Report, 2006) and lack ofprepayment mechanisms to pool risks)(Njoku, Ohagwu & Okaro 2010); making affordability of the high cost of care often associated with chronic illness difficult.

These could hinder access to quality care leading to increased morbidity, mortality and productivity losses which spells ill for national development as the active productive age group are mostly affected in West African Sub- region (Obayendo, 2008). The investigator as a nurse clinician observed that some patients came for follow-up appointment without investigation results, keep irregular appointments and report backwith severe complications. Some dischargedpatients await bill settlement for weeks because of inability to pay.

One is bordered that despite the UN in 2011 raising the status of NCDs to that of HIV/AIDS, TB and Malaria because of their economic andhealth importance, there is neither support, norfinancial risk protection (exemption) for DM which is presently assuming an epidemic

proportion (7%) of Nigerians and presence of development partners and Non- governmental organisation (NGOs) have not been felt in DM care (Sridhar, 2011).There is dearth of data on the magnitude of economic burden borne by Diabetics and their payment coping mechanisms in Nigeria.The researcher was persuaded to assessthese among Type2 diabetics, with a view of providing evidenced-based dataforintervention on the economic burden of diabetes mellitus through appropriate policy decision making.

The Purpose of the Study

This study determined the economic burden incurred and assessed payment strategies and payment coping mechanisms used by diabetics attending the Federal Medical Centre Umuahia.

Objectives of the Study

The objectives of this study were to:

- Determine the direct cost of care borne by patients in treatment of diabetes mellitus.
- Assess the indirect cost incurred by diabetics in accessing care for the disease.
- Assess the catastrophic cost to different socio-economic status groups of diabetics.
- Identify the various payment strategies used by diabetics.
- Identify payment coping mechanisms used by diabetic patients and their families in treating the disease.

Research Hypotheses

- There is no significant difference between socio-economic groups and catastrophic D.M costs.
- There is no significant difference between socio- economic groups and payment strategies used by the diabetics.

- There is no significant difference between socio- economic groups and payment coping mechanisms used by the diabetics.

Significance of the Study

The findings will expose the magnitude of the economic burden of diabetes from the perspective of the people living with diabetes (PLWD) and provide evidence to support advocacy positions to provide risk protection for diabetics and the other NCDs.

The findings from the study will be used to attract support from governmental and non-governmental organisations and agencies to support diabetic care.

It will also aid understanding of the economic impact of diabetes and challenge both administrators and clinicians to plan and implement qualitative and cost effective care that will reduce length of hospitalization and frequency of patientsô visits thus curb cost of diabetes care.

The findings can aid decision making on resource allocation to diabetes and other non-communicable diseases, prioritizing research funding and justifying funds for existing health problems and new (emerging) epidemics like diabetes.

It can also form an empowering instrument for the diabetics to pool their resources together, form strong support groups and ask for government support in terms of subsidy for treatment, exemption or securing insurance policy for diabetics as a social responsibility. Knowledge of cost incurred by individuals with diabetes will help clinicians and educators to provide useful advice to diabetics about controlling and reducing burden of diabetes on individual levels through effective self management. Understanding the magnitude of economic burden of D.M will provide basis for intervention on economic burden in terms of cost of illness and catastrophic costs. Understanding payment strategies and payment coping mechanism will provide evidence-base for improved financing, attention and co-ordination.

Scope of the Study

The study covered all diagnosed diabetics who have been receiving treatment from Federal Medical Centre Umuahia within the past one year (2011/2012). Both males and females within the age bracket of 31-65 years were studied (hosts West African peak prevalence (31-50) and age of onset of increasing incidence of DM complications 65years). The study involved outpatients attending FMC Umuahia.

Operational Definition of Terms

For the purpose of this study the following terms were defined as follows;

- Economic burden refers to direct, indirect and catastrophic healthcare costs incurred in managing diabetes mellitus.
- In this study direct cost refers to cost related to diagnoses, drugs, investigations, follow up costs, travel cost, etc. Indirect cost refers to monetary value of time spent travelling, waiting time in hospitals, time spent without working, time accompanying relative, time lost through premature death or premature retirement measured against the daily wage rate for individuals. Catastrophic healthcare expenditure of diabetes refers to spending on diabetic care of 40% or above of oneôs non-subsistence (non-food) consumption expenditure. That is income available after basic needs have been met (WHO, 2005). For this study catastrophic expenditure thresholds 40%, 30% and 10% were used for all classes then 10% and 30% were considered for the poorest and the least poor respectively.
- **Payment strategies** are methods of payment for healthcare that could be used by the diabetics: out-of ï pocket (oops) cash and carry, refund after payment, health insurance, exemption from payment, community based insurance (ñisusuò) , NGOS , deferred payment, installmental payment, in-kind payment, pre-payment (off front payment) etc

- **Payment coping mechanisms** are the various means diabetics utilize in meeting up with the cost of medical care example own money (earmarked savings/earnings), money borrowed/loan, someone else paying, community based support, sale of household assets, gifts, appeal for support /begging, sale of land, temporary stoppage of childrenôs education, Government support (social welfare waiver), cutting down on minimum consumption expenses ,diabetes association social support, including cost saving/cost evading behaviours like skipping appointment when feeling strong (deferred visit), skipping of doses of drugs to last longer, use of alternative treatment methods etc.
- **Type2 Diabetic patients** are individuals with physicianôs diagnosed diabetes mellitus except gestational D.M.
- **Socio-economic status** refer to the categorization of respondents into different classes based on the acquisition of household assets like radio, television, bicycle, motorcycle, air conditioner, electric fan, fridge, generator, gas cooker and car and their food and other household expenditure on an assets based socio-economic status (SES) index. It was used as proxy for income.

CHAPTER TWO

LITERATURE REVIEW

This chapter presented the concepts, related literature to the study and framework that formed the basis of study. It was presented under the following subheadings: concept of diabetes mellitus, economic burden of diabetes mellitus, payment strategies in healthcare, payment coping mechanism for diabetes mellitus, Conceptual frame work for the study, empirical studies and **s**ummary of literature.

Concept of Diabetes Mellitus (DM)

Diabetes mellitus is a group of chronic metabolic disorders in which the body either does not produce enough or does not properly respond to insulin; a hormone produced by the beta cells of islets of Langerhans of the pancreas (Adebayo, 2009).Insulin enables cells to absorb glucose in order to turn it into energy. American Diabetic Association describes diabetes as a group of metabolic disorder characterized by increased level of glucose in the blood as a result of defect in insulin secretion or improper insulin action often due to autoimmune reaction. Where there is absolute or relative insulin deficiency accumulation of glucose in the blood results. (Adebayo, 2009).

It is a disorder primarily of carbohydrate metabolism in which sugar in the body are not oxidised to produce energy due to lack of pancreatic hormone; insulin. The accumulation of sugar leads to abnormal high levels (200mg/dl and above) in the blood (hyperglycaemia).When the renal threshold of glucose is also exceeded (180mg/dl) sugar appears in urine (glycosuria). In this state, the body uses fat and protein as alternative sources of energy leading to the disturbance of acid/base balance, the accumulation of ketones in the blood stream (ketosis) (Hornby, 2007). Diabetes is, therefore, a syndrome or group of diseases rather than one disease leading to the prolonged hyperglycaemic state.

Clinical manifestation of diabetes depends on the patientsô level of hyperglycaemia. The classical features of all types of diabetes include but not limited to the ñ3PSôô (polyuria, Polydipsia and Polyphagia). Polyuria (excessive urination) occurs as the body tries to get rid of excess glucose in the blood by excreting it in urine. This can also lead to dehydration as sugar carries with it water in large volume. Polydipsia (excess thirst) occurs as a result of excess fluid loss associated with osmotic diuresis. Polyphagia (increased hunger), results from the catabolic state induced by insulin deficiency and the breakdown of proteins and fats. Other symptoms include: weight loss despite increase in calorie intake, fatigue and weakness. The use of alternative sources of energy for daily living requires more utilization of energy thus leaving the patient fatigued. Sudden vision changes, tingling or numbness in the hands or feet, dry skin, skin lesion or wounds that are slow to heal, and recurrent infections are features. Dehydration and often serious disturbance in blood levels of potassium and keto-acidosis could lead to coma and death if prompt and intense treatment is not executed. Type 2 diabetes is more subtle in onset and can escape notice for many years. Patient can develop hyperglycaemic hyperosmolar non-ketotic syndrome (HHNS). (William & Hopper, 2004; Smeltzer et al, 2008; Obayendo, 2008)

There are basically three (3) types of diabetes, although some authors classify diabetes resulting from complications of other diseases differently. The types are type 1, type 2, and gestational diabetes. This study is confined to type2 DM.

Type2 Diabetes

This forms about 90-95% of all diabetes. It was formally known as adult onset or maturity onset diabetes, ketosis resistant, stable diabetes or non-insulin dependent diabetes (NIDDM) (Odeleye, 2008; Smeltzer et al 2008). Age at onset is usually above 30 years. The client is

usually obese at diagnosis. About 80% of type 2 diabetics are obsessed. (Ikhisemoje, 2006; Smeltzer et al., 2008)

The two main problems related to insulin in type 2 diabetes are insulin resistance and impaired insulin secretion. Insulin resistance refers to decrease tissue sensitivity to insulin. Normally insulin binds to special receptors on cell surfaces and initiates a series of reactions involved in glucose metabolism. In type 2 diabetes, these intracellular reactions diminish making insulin less effective at stimulating glucose up take by the tissue and at regulating glucose release by the liver. The exact mechanism leading to insulin resistance and impaired insulin secretion is unknown. Numerous theories have been put forth. For example, some authorities stipulate that central obesity and fat concentration around the waist in relation to abdominal organs (not subcutaneous fat) is known to predispose individuals to insulin resistance. Abdominal fat is said to be active hormonally. It secretes a hormone called adipokines that may impair glucose tolerance. (Adebayo, 2009)

Although type 2 diabetes may go unnoticed for some years because the symptoms are typically mild, non-existent or sporadic, severe long term complications can occur. Type2 diabetes has enough insulin to prevent fat breakdown and the consequent keto-acidosis but uncontrolled type2 diabetes has a second problem; hyperglycaemic, hyperosmolar non ketotic syndrome (HHNS). It is a serious diabetic state in which hyper-osmolarity and hyperglycaemia predominate, with alterations of the sensorium. Ketosis is usually minimal or absent. Persistent hyperglycaemia causes osmotic diuresis which results in loses of water and electrolytes. With glycosuria and dehydration, hypernatremia and increased osmolarity occur. HHNS occurs more often in older people (50-70) who have type2 DM. In HHNS, the insulin level is too low to prevent hyperglycaemia and subsequent osmotic diuresis, but it is high enough to prevent fat breakdown. Patients with HHNS may tolerate Polyuria and Polydipsia until neurologic changes prompts them to seek treatment. Because of possible

delay in therapy, hyperglycaemia, dehydration and hyperosmolarity may be more severe in type2 DM. (Adebayo, 2009)

Other common complications of type2 diabetes include but not limited to renal failure, vascular diseases, including coronary artery diseases, loss of sensation or pain related to diabetic neuropathy, vision damage due to diabetic retinopathy, liver damage from non alcoholic steato-hepatitis, and heart failure from diabetic cardiomyopathy (Adebayo, 2009). All these have implications for the clientsô quality of life and economic burden. Health and economic losses associated with DM are incalculable (Idris 2009). It is expensive to treat, but generally preventable and controllable if detected early. Stressing the importance of early identification and treatment of diabetes, Odeleye, (2008) emphasised that type2 diabetes is a serious and costly health problem for which early diagnosis and treatment is necessary to prevent long term complications

Risk Factors\Causes of Diabetes

The causes of diabetes continue to be a mystery. Although both genetic and environmental factors such as obesity and lack of aerobic exercise appears to play roles (Obayendo, 2008). It has been observed that type2 DM is familial; if both parents have type 2 DM there is a chance that nearly all their children will have type2 diabetes. In identical twins if one develops type 2 DM the chance is nearly 100% that the other twin will develop it. Increasing age has been identified as a diabetes risk factor. Although diabetes may occur at any age, 80% of cases occur after 50 years thus incidence increases with age. Gender has also been implicated in type2 diabetes. It is commonly seen in elderly males but strong evidence of developing type2 diabetes in females with polycystic ovarian syndrome and multiple pregnancies have been observed. (Adebayo, 2009)

Obesity and fat distribution is seen as a major risk factor to type2 due to associated increased insulin resistance; if body fat is more than 30% (body mass index, BMI) $25m^2$ and above, waist girth 35 inches in women or 40 inches in males the risk increases (Obayendo, 2008). Sedentary life style is a contributory factor. Stress either physical injury or emotional disturbances are frequently blamed as the initial precipitator of diabetes. The disturbances in the corticosteroid or Adreno-corticothrophic hormone therapy may lead to clinical signs of the disease (Smeltzer et al, 2008)**.** Other drugs apart from the hormonal agents that can induce diabetes include; Clozapine (Clozaril), steroids, Thiazide diuretics, alloxan, streptozocin etc. (Potter and Perry, 2005).

Environmental factors implicated in Type2 D.M include poor diet (malnutrition related to diabetes), stress, viral infection, improper nutrition (low protein and fibre, high saturated fat and refined product in take, smoking, alcoholism etc (Obayendo,2008).Studies have shown that certain diseases and syndromes like hypertension, pancreatic tumours have direct relationship with diabetes. There is report of direct relationship between systolic blood pressure (Bp>or= 140/90mmHg) and diabetes (Ikhiesmoje, 2009). Pre-diabetes; a condition in which the blood sugar level is higher than normal but not high enough for the diagnosis of diabetes is a major risk factor. This condition is also called impaired fasting glucose or impaired glucose tolerance. Many people with this status develop type2 diabetes within 10years. (Obayendo, 2008).

Gestational diabetes is also type2 D.M risk factor as women who had D.M in pregnancy may remain diabetic or develop D.M type2 within 10years. These risk factors have implications for effective diabetic management and cost containment (Obayendo, 2008)

Diagnosis of diabetes mellitus

An abnormally high blood sugar level is the basic criteria for the diagnosis of diabetes. Fasting plasma glucose (FPG) levels of 126mg/dl (7.0mmol/L) or higher or random plasma glucose levels exceeding 200mg/dl (11.1mmol/L) on more than one occasion are diagnostic of diabetes. Oral glucose tolerance test and the intravenous glucose test are no longer recommended for routine clinical use (American Diabetic Association, 2004).

The current criteria for diagnosis of diabetes as recommended by American Diabetic Association (ADA, 2004) and International Diabetes Federation (IDF, 2005) are as follows:

- Classic symptoms of diabetes plus plasma glucose concentration equals to or greater than 200mg/dl (11.1mmol/L). Causal is defined as anytime of the day without regard to time since the last meal. (International Diabetes Federation, 2005)
- Fasting plasma glucose (FPG) greater or equal to 126mg/dl (7.0mmol/L). Fasting is defined as no caloric intake for at least 8 hours. FPG of 100-125mg/dl is regarded as pre-diabetes.
- Two hours post load glucose equal to or greater than 200mg/dl (11.1mmol/L) during an oral glucose tolerance test. The test should be performed as described by WHO using a glucose load containing the equivalent of 75g anhydrous glucose dissolved in water. In the absence of clear hyperglycaemia with acute metabolic decompensation these criteria should be confirmed by repeating on a different day. This is not recommended for routine clinical tests. (Obayendo, 2009 ; Smeltzer et al, 2008; IDF 2005)
- Another useful blood test used for diagnosis is glycosylated haemoglobin test (HbAic). Glucose in the blood attaches to haemoglobin in the red blood cells. Red blood cells live 3 months in the body. When the glucose that is attached to the haemoglobin is measured, it gives an average blood glucose level for the previous

three months. Normal value is 4-7%. This is a helpful measurement when blood glucose levels fluctuate and also assist in determining the degree to which a client is following prescribed treatment. (Eniyansoro, 2007; ADA, 2004).

- Research has shown that oral glucose tolerance test is more sensitive than FPG test for diagnose of pre-diabetes but it is less convenient to administer. Blood glucose is checked four (4) times during the test. If two are abnormally high, pre-diabetic is diagnosed. Aside from assessment for diagnostic purpose, ongoing specialized assessment of patient with diabetes and evaluation for complications in newly diagnosed diabetes are important components of care. Use of glucometers/glucotrends to monitor or screen for diabetes are useful tests. These have implications for economic burden of diabetes mellitus.(Smeltzer et al., 2008)

Epidemiology of Diabetes Mellitus

Diabetes is a serious non communicable disease. It affects a greater number of the worldôs population with far reaching health and economic consequences (Adamu, 2003)

The World Health Organisation (2008) estimates that more than 180 million people worldwide have diabetes and Adamu (2003) projected a worldwide prevalence of 320 million by 2010 especially of type 2 diabetes, which he attributes to adoption of western lifestyle , ingestion of highly refined foods, sedentary lifestyle predisposing to obesity, hypertension, heart diseases, kidney damage among others. The consequences of unhealthy lifestyle include, among other things, alarming incidence of diabetes mellitus (Smeltzer et al, 2008)

A multinational research report about one hundred and thirty-four (134) countries with a population of 5.5 billion, of which 15.1million, were adults were living with diabetes. It disclosed that diabetes carries five-fold risk of cardiovascular disease and three-fold of stroke, and a major cause of death by disease and complication (Odeleye, 2008). WHO

(2008) projected that by 2020 chronic diseases will account for almost $^{3}/_{4}$ of all deaths worldwide and that 70% of deaths due to diabetes will occur in developing countries. They also noted that the prevalence of diabetes will increase from 84 million in 1995 to 228 million in 2028 (Murry and Lopez, 2008). A conservative estimate of 15-20% of all hospitalized patients having diabetes and a vast majority of such hospitalization is as a result of co-morbidity and not primarily because of diabetes. Demographic changes trigger the diabetes epidemic. By 2030, if age specific prevalence remains constant, over 82 million cases, will occur in developing countries, while 48 million in developed ones. (Silink, 2005) It is observed that the number of diabetic cases worldwide has significantly increased in the last decade and is associated with reduced life expectancy, increased morbidity and diminished quality life (Zeck & Mc Intyre, 2008). This was corroborated by the World Health Organisation with report that the overall risk of premature death is twice as high among individuals with diabetes as for those without it. The WHO projected that type2 diabetes will increase by 42% in developed countries and by 70% in developing countries and that by 2025 greater than 75% of people with diabetes will reside in the developing countries.

Type2 Diabetes and its complications impose significant economic consequences on individuals, families, health system and countries. Currently, there is a diabetic prevalence of 246 million worldwide and this growing threat is an under-appreciated cause of poverty and hindrance to economic development (WHO, 2009). In United States of America (USA), almost 21 million people live with diabetes and as many as $^{1}/_{3}$ are unaware that they are diabetic (Ikhesiemoje, 2006). Centre for Disease Control (CDC) USA (2005) projected an increase to 30 million by 2030. The result of the research made by Search for DM Study Group of ADA (2010) provides 1.82 cases per 1000 youths (under 20 years) in USA with diabetes. They affirmed that diabetes is one of the leading chronic diseases in childhood and adolescence. Diabetes is observed to be a leading cause of death and disability in USA.

Type2 DM is commoner in older people who are overweight. It is more prevalent in Africans, Hispanic Americans/ Latinos and American Indians (Ikhesiemoje 2006). The prevalence of diabetes in the African region was estimated at 7.02 million in 2000, out of which 6.318 million had type 2. An estimated 2.9 million deaths from diabetes (case fatality of 0.016) have reportedly occurred in the African region. An estimated 20.8 million people in Nigeria (7% of the population) have diabetes. 14.6 diagnosed and 6.2 million have not been diagnosed (Ikhesiemoje, 2006).

Diabetes is the sixth leading cause of death in Nigeria. There is the possibility of under reporting diabetic deaths via death certificate because 65% of deaths among diabetics are attributed to heart diseases and stroke (Adamu, 2003; Ikhesiemoje, 2006; Obayendo, 2008). 1:20 adult deaths in developing countries are diabetes-related. Its health and economic burden is heavy to the point where public health authorities call it ñan epidemicôô that requires urgent attention. Annual incidence of diabetes in Nigeria is 800,000. In rural African countries like Nigeria diabetes-related morbidity and mortality are caused mainly by limited access to insulin and its cost and lack of infrastructure within the healthcare system (Nwankwo et al, 2010; Obayendo, 2008). Diabetes related conditions comprise 15% of entire medical admission and the case fatality rate was 16% in Nigeria. A case fatality of 53% was reported among diabetics with foot ulcers in Lagos University Teaching Hospital, Lagos, Nigeria. (Ogbera, et al., 2007)

Management of diabetes

Diabetes has high health and economic burdens. It is preventable and if detected early much of its life distressing complications that impinge on the quality of life, life expectancy and increased cost could be curbed off. The International Diabetes Federation (IDF) provided a guideline of the management of diabetes which is believed that when effectively

implemented will result to qualitative care for the diabetics worldwide. This will form the basis for this study because it captured diabetic care in all the three levels of prevention. It also took into consideration poverty levels and access to healthcare facilities. It aims at reducing to the barest minimum the health and economic burden associated with diabetes through qualitative care. Basically, diabetes could be managed with diet alone, diet with oral hypoglycaemic agents, diet with insulin or combination of diet, oral hypoglycaemic agents or insulin depending on the severity of the condition. Exercise, education and monitoring of blood glucose levels and early onset of complications are essential aspects of care.

IDF (2005) developed a global guideline that is sensitive to resources and cost effective issues. They adopted an approach called ñlevels of careò. Three levels of care in diabetes management identified by IDF are standard care, minimal care and comprehensive care. They also identified 19 areas that constitute optimal management for diabetes upon which these 3 levels of care should be implemented for the best benefits of diabetics. This is not just in terms of quality of life but costs. The 19 areas coded 01 to 19 are as follows: 01, screening and diagnosis; 02, care delivery; 03, educations; 04, psychological care; 05, lifestyle management ; 06, glucose control levels; 07, self monitoring; 08, clinical monitoring; 09, glucose control-oral therapy; 10,glucose control-insulin therapy; 11, blood pressure control; 12, cardiovascular risk protection; 13, eye screening; 14, kidney damage; 15, foot care; 16, nerve damage; 17, pregnancy; 18, children; and 19, in-patient care. These areas contribute to the direct and/or indirect costs (economic burden) of diabetes at either primary, secondary or the tertiary levels of prevention. The magnitude of the cost depends on the level of care the diabetic receives (IDF, 2005). The three levels of care identified by the IDF are discussed below.

- Standard care ï this is evidence-based care which is cost effective in most nations with a well-developed service base, and with health care funding systems consuming

a significant part of the national wealth. It should be available to all people with diabetes and the aim of any health care system should be to achieve this level of care. However, in recognition of the considerable variations in resources throughout the world, other levels of care have been described to acknowledge low and high resource situations (inequity in the healthcare system).Healthcare delivery system in Nigeria is grossly inadequate to handle the various intricate lifelong management issues of diabetes and its high economic costs. The choice of level of care will likely depend on the payment strategies and coping mechanisms available to the diabetics. (Nwankwo et al., 2010)

- Minimal care is the lowest level of care that one with diabetes should receive. Standard medical resources and fully trained health professionals are often unavailable in poorly funded healthcare system, like Nigeriaôs, where the budgetary allocation for health is lower than 5% of the total budget recommended by WHO in 1988 (Okoronkwo, 2004). Minimal care level aims to achieve with limited and cost effective resources a high proportion of what can be achieved by standard care. Only low cost or high cost-effective interventions are included at this level.
- Comprehensive care levels use the most up-to-date and complete range of health technologies that can be offered to people with diabetes. This aims at achieving best possible outcomes. However, IDF task force on diabetes (2005) states that the evidence base supporting the use of some of these expensive or new technologies is relatively weak. No matter the level of care, IDF (2005), emphasizes that all people diagnosed with diabetes should receive individualized, culture-sensitive care. Collaborative relationship, where patients are actively involved in the consultation and opportunities created for them to ask questions and express concerns should be encouraged. Multidisciplinary team with specific expertise should be maintained by

continuing professional education. This team should provide care around the patient; provide urgent access to diabetes healthcare advice for unforeseen problems. The team should also carry out immediate and ongoing care using a systematic approach. They should offer annual surveillance of all aspects of diabetes control and complication for all diabetes, using an agreed care plan. The team ensure that every diabetic is registered to facilitate recall for annual complication surveillance. Contact should be maintained with patients and consideration for developing the patients as competent self carers, knowing their limitations while working with their local/regional associations. Efficiency in care delivery can reduce hospital stay, prevent or minimize complications and reduce the economic burden of diabetes. IDF also opined that education in the broadest sense underpins diabetes care. Recognition that 95% of diabetes care is provided by the diabetics and their families, every contact between the health team and the diabetic must reflect diabetic education. Currently the terminology of diabetes self management education(DSME) programmes highlight this need, believing that if the diabetic takes self responsibility and effective care of themselves, frequency of acute complications will reduce; number of visits to hospitals will also decrease thus reducing cost of diabetic care. Because the diabetics perform the bulk of care by themselves, evaluation of their economic burden is best ascertained from them.

Education is used in the key areas of diabetes management for example, dietary, exercise, medication (insulin and oral anti-diabetic drugs), lifestyle modification (smoking, alcohol intake etc) and prevention of complication. If the diabetics have good knowledge in these areas and maximize their use, both health and economic burden are likely to reduce.

Patient education should be seen as an integral part of diabetes management from the diagnosis, ongoing basis, at annual reviews and on request. Trained multi-disciplinary team

should provide education to groups or individuals as the case may be. IDF emphasizes that education must be accessible to all people with diabetes taking account of culture, ethnicity, psychosocial and disability issues. The whole aim is to deliver cost effective care and improve the quality of life of diabetics. Although education could help to contain cost, the 19 areas of diabetic management by IDF (2005) attract costs (direct and indirect). For instance glucose control (oral and insulin), clinical monitoring (laboratory and other clinical measurements), self monitoring of glucose, blood pressure control cardiovascular risk protection , eye screening, foot care, assessment of kidney damage etc could attract direct costs while nerve damage, eye damage, heart diseases and psychological trauma(pain) associated with the disease attracts indirect costs. Attendance for inpatient and outpatient care could attract both. It is yet to be determined what proportion of these economic costs of diabetes is borne by diabetics, payment coping mechanisms available to them and how patients from resource limited areas like Nigeria cope with their care (IDF, 2005).

Despite the good interventions of the IDF guideline, optimal diabetic management has not reached many in resource limited areas probably because the healthcare system is grossly inadequate to handle the various intricate lifelong management issues of diabetes (Nwankwo Nandy & Nwankwo, 2010). This calls for effective economic management of health care delivery. Although, extended family, health professionals and co-workers are affected by chronic illness, the problem of living with chronic condition is most acutely experienced by patients and the immediate families. They experience the greatest impact of lifestyle changes and economic burden that directly affect quality of life (Mold, Fryer & Thomas 2004; USA Department of Health and human services 2005)

Concept of Economic Burden of Diabetics Mellitus

Economic burden of Diabetes correlates logically with a classic cost-of-illness (COI) study in which cost of healthcare is usually divided into direct (healthcare cost) and indirect costs (productivity losses) (Rice, 2000; Songer, Ettaro, & economics DM panel, 2000; Russell, 2004). A third category, intangible cost, is usually not included because of measurement difficulty. A major economic burden for countries comes from the high prevalence of diabetes and its complications (Azevedo & Allai, 2008). They reported that economic importance, complications and death toll are compelling government to pay more attention to its impact as thousands of Africans run risks. They asserted that the catastrophic potential of the epidemic (diabetes) will surpass the ravages of HIV/AIDS in the continent and simply overwhelm the resources.

Idemyor, (2010) notes that the majority of the people with diabetes in sub-Saharan Africa are within the economically productive age group of 30-45 years and that the late diagnosis of diabetes in the region among other health system problems leads to early presentation of diabetic complication making its economic cost much higher. Economic cost of Diabetes continues to increase because of increasing health care costs, an aging population and lifestyle issues (Ikhesiemoje, 2006). Diabetes experts observed that more than half of diabetics who are older than 65years are hospitalized each year (Silink, 2005; Odeleye, 2008; Obayendo, 2008; Idris, 2009). Diabetes imposes a large economic burden on individuals and national health system and that the burden borne depends on differences in purchasing power. Huge financial burden on diabetics/families depends on their economic status and the social insurance policies of the countries they live (Zhang et al, 2010). Diabetics in developing countries pay a large share of the costs because of the poor organised system of medical insurance and/or lack of government provision of medical services.

Economic burden of DM on patients, family community and nation is enormous because of limited availability of private medical insurance and absence of a free national health services in most countries of Sub Saharan Africa. This means that the burden of DM is on the patient or the family (Mbaya, 2003). Economic burden of DM will be discussed under direct indirect and catastrophic costs with particular reference to developed and developing countries.

Direct costs

Direct costs are those generated by the resources used in treating or coping with the condition. It includes expenditures on inpatient treatment, physician and other specialist consultation fees, prescriptions, drugs (insulin and oral hypoglycaemic) agents and adjuvants, laboratory tests, medical supplies, employment of extra worker, transportation for treatment etc. It may include cost of co-morbidity attributed to diabetes. (Chang & Javit, 2000; Rice, Kalman, Millerf and Dunmeyer and National Academy of science panel (NASP, 2010).

Direct costs are often easily measured by survey. This measurement could assume any of three designs: Based on a diagnostic category data from general population, cost projection from previous studies and responses from persons with diabetes. This study will assume the individual based approach (Bottom-up). The economic cost of diabetes can be estimated based on cost of individual units of services performed or received. It uses average cost of service estimate and applies the data to the total number of healthcare encounter related to diabetes to arrive at an estimate of cost of diabetes. A complete treatment will encompass all contacts of a patient with the medical system (NASP, 2010). IDF (2005) estimated that annual direct cost of Diabetes worldwide for people aged 20-79 years was about 153 billion international dollars. Silink, (2005) noted that direct medical cost incurred by diabetics 65years and above was a little above half the total expenditure because they visit their

physicians twice as often as those 45- 64 years. Substantial economic burden to society and its citizens are incurred from direct costs of medical care (Chiang & Javit , 2000).

Direct medical costs for diabetes care, including hospitalization, medical care and treatment supplies totalled $ 92 billion in USA in 2002 (ADA). Annual cost of diabetes in USA was $14.4 billion in medical cost and lost income (Tao, Pietropeolo, Atkinson, Schatz and Taylor 2010).

In Canada, Dawnson, Gome, Gerstain, Blancher & Kahler, (2007) noted that the economic cost of Diabetes in 1998 was between $4.76 and $5.23billions. In new diabetes without complications, they reported a cost of $573 million while those with associated complications (cardiovascular diseases) were by far the greatest, at $637 millions. In Norway, there was a total cost of ú293 million (1.4% of the total healthcare expenditure). Pharmaceuticals account for ú95 million (32%), Medical Devices ú40 million (14%), Hospital admissions 21 million (7%). Patientôs expenditure for Acupuncture, physiotherapy and foot therapy were many times higher than expenditure for nutritional guidance (Solli, Jenssen, & Kristiansen, 2010). Zhang et al., (2010) noted that the costs of diabetes in Australia and China for an individual were $2179 and $473 respectively per annum and in India, which has the largest diabetics worldwide, the diabetic cost per person per annum was $7038 and the poorest person with diabetes spends an average of 25% of their total income on healthcare and in the poorest countries diabetics/families bear almost the whole cost of medical care. However, in Taiwan, the total cost of disease borne by each patient with diabetes was US $3065.7 per annum. Total cost of diabetes to society approximates to US $2.96billion approximately 0.8% GDP of Taiwan. The bureau of National Health Insurance alleviates approximately 1/3 of the burden for the patients. Further, in Sudan annual median expenditure for Diabetes was $283 per diabetic in 2006 (Zhang et al., 2010).

In WHO African Region, countries with less than 2000 gross national income per capita, has a diabetes cost of about $5,510,000, in 2005 (Kiriga et al., 2009). They reported a total economic loss of $2,551 in 2000 for WHO African Region. Countries with gross national income (GNI) per capital greater than 8000 international dollar lost $ 11,436, countries with GNI between $2000- $7999 spent $4,770.6 while countries with GNI less than 2000 incurred cost of $2,144.3 per diabetic per year. This shows a heavy economic burden of Diabetes in this region. This demonstrates the huge negative economic impact that diabetes has on the society beyond personal costs of illness and premature death (Kiriga, et al., 2009). The economic expenditure on diabetes in Burundi is less than $10 while in Cote dôvoire, Myanmar, Ethiopia, Liberia, Niger, Guinea Bissau, Madagascar, Eritrea, Sierra Leone, Montengro and Somalia the expenditure is less than $20. Most of these costs could not cover the annual whole sale cost of a generic oral agent capable of preventing acute complications of diabetes (Zhang et al, 2010). In 2001, the average cost of treating patients with DM in Cameroun was 3.5% of National budget for 2001-2002 (Mbaya, 2003).

Diabetes is a very expensive health conditionô and itsô financial implication is too heavy for the high income earners let alone the poor families. Poverty is linked with poor diabetes outcome due to inability to receive adequate care and procure diabetes supplies regularly (Nwankwo, et al, 2010). They noted that the burden of people with diabetes is due to acute and chronic complications like diabetic foot ulceration and these also increase the economic burden of diabetes. Onwujekwe et al, (2010) reported that the monthly cost of treatment ranged from N44.70 in rural areas to N1, 477.00 for the urban. Transportation was N35.30 in urban and N162.30 for the rural areas Southeast Nigeria. The mean cost of treating diabetic foot syndrome in Nigeria is ك180,581.60 (Ogbera, et al, 2007). Diabetic foot syndrome is a major complication of diabetes, that is very difficult to heal and its cost of treatment is

enormous (Adamu, 2003). There is dearth of data on the direct cost of DM in Nigeria (Nwankwo, et al., 2010 ; Magashi, 2011).

Indirect Cost of DM

Indirect costs of diabetes address the potential resources that are lost as a result of one having diabetes. It therefore refers to income forgone because the individual has diabetes (Williams, 2002). It describes the opportunity cost of productivity losses. They include: time absent from work due to illness or attendance to healthcare, inability to work because of disability, cost of transportation, premature retirement because of disability, premature mortality because of acute or chronic complication of diabetes, time off work taken by carers of diabetics, cost of employing extra worker to help in home care of the diabetic etc.

Diabetes is a major global cause of premature mortality and productivity losses. The largest economic burden caused by diabetes is the monetary value associated with disability and loss of life. The losses are relatively larger in poorer countries because of premature deaths due to diabetes which occur earlier (Zhang, et al, 2010). The indirect cost can be measured by using the human capital approach devised by Rice in early 1960s and it assumes that the value of lost work hour is equal to the amount of money which the individual would have been paid to do their work. This is extended to the value of productivity loss as a result of early retirement or premature death from diabetes. Substantial economic burden to society and its citizens are incurred from indirect cost (loss and premature mortality) (Chiang & Javit, 2000).

In 2002, indirect costs including disability payment, time lost from work and premature death, totalled $ 40 billion in USA (ADA, 2002). Solli et al, (2010) report that indirect costs (loss of productivity from job absenteeism accounted for ú 70.1 million (24%), sick leave (ú 16.7 million), Disability support (ú 48.2 million) and other indirect costs (ú 5.3 million). With the inclusion of all diabetes related care (primary and secondary diagnosis) the total expenditure was ú 535 million, about 2.6% of total healthcare expenditure in Norway. Zhang

et al, (2010) reported the net losses in income in India and Tanzania as $236.6billion and $2.5billion respectively. The authors noted that in Tanzania, indirect cost of diabetes, calculated as healthy life days lost by a diabetic because of acute illness, chronic disability and premature death, was 4,100 days per patient.

In rural African countries, most deaths could be attributed to limited access to insulin and its cost and lack of infrastructure. It should be appreciated that these premature death, disability and associated productivity losses have far-reaching consequences for the society, but much more for the diabetics and their families (Nwankwo, et al, 2010). These account for the indirect costs of diabetes. Death from diabetes in Nigeria is widely underestimated, because only a minority of persons with Diabetes die from a cause uniquely related to diabetes (Obayendo, 2008; Odeleye, 2008). However, there is dearth of data on the cost of managing individuals with diabetes and the costs borne by patients/families in Nigeria and other Sub-Saharan African countries. There is therefore an urgent need to quantify the cost of DM and to place diabetes on the Policy Agenda for integration into the National Health Policy and strategies so that Diabetic management cost will be considered to compete with other sensitive health issues like HIV/AIDS, TB and malaria control (Sridhar, 2011).

Concept of Catastrophic Health Cost

The World Health Organisation noted that every year 150 million individuals from 44 million households face financial catastrophe as a result of paying for healthcare and more than 100 million individuals are pushed deeper into poverty by the need to pay for healthcare WHO, (2005). They opined that when people have to pay fees or co-payment for healthcare, the amount can be too high in relation to income that it results to financial catastrophe for individual or household. At such expenditure people cut down on consumption of basic necessities such as food, clothing or are unable to pay for their childrenôs education (WHO, 2005). WHO proposed that health expenditure can be viewed as catastrophic when it is

greater or equal to 40% of a household subsistence income, which is income available after basic needs have been met. They note that catastrophic health expenditure is a factor of three issues; availability of health services requiring out-of-pocket spending (OOPS), low household ability to pay and lack of prepayment mechanisms for risk pooling.

A household's capacity to pay is defined as effective income remaining after basic subsistence needs have been met. Effective income is taken to be the total consumption expenditure of the household which is a more accurate reflection of purchasing power than income reported in household survey (Ke, Evan, Kawabata & David, 2010). When healthcare spending falls outside of the standard range for the class of individual's non-subsistence income consumption, it is called catastrophic expenditure. Subsistence consumption is defined in terms of the median household's spending for food. The authors note that households differ in their socio-economic status and can suffer financial catastrophe at different levels thus countries can fix their levels.

OOP financing of health care leaves the households exposed to risk of unforeseen expenditure that absorbs a large share of household budget (Donnel, Doorsaler, Eliya, and Somanathan, 2007). The authors state that household total consumption is positively correlated with the incidence of catastrophic payment and payments that are catastrophic are those that disrupt household living standards by absorbing a large fraction of household resources. Mudur (2007) saw catastrophic payments as those that are so crippling financially that they severely disrupt household living standards. Payment for household is said to be catastrophic when it exceeds a defined level of household income and leads the household to sacrifice of the consumption of other items that are necessary for their wellbeing, such as shelter or education (Ke, 2007). For household living close to poverty line, even low level of expenditure on healthcare maybe sufficient to tilt them into poverty. However the experience of distress spending differs with socio-economic status. Catastrophic expenditure can be

measured using either fixed level (40%, 20% and 10%) or variable (5% for poorest and 40% for the least poor) threshold to find the percentage of households that will experience financial catastrophe. Past researches set the threshold level for catastrophic expenditure ranging from 5% to 40% of total household expenditure that is spent on health. Experts agreed that family expenditure more than 10% could be catastrophic (Onoka, Onwujekwe, Hanson & Uzochukwu, 2010). This study will adopt 40% threshold for catastrophic expenditure for D.M. and check for catastrophic expenditure at 10% and 30% for poorest poor and least poor respectively.

Catastrophic Health Expenditure in Nigeria

There is a growing concern about economic impact of healthcare expenditure on household who face illness particularly in areas where prepayment mechanisms do not exist and households have to make out of pocket expenditure to use health services. Nigeriaôs private expenditure accounts for almost 70% of total expenditure on health of which 90% is out-of-pocket expenditure (Onoka, et al, 2010). This high level of out-of-pocket expenditure implies that healthcare can place a significant financial burden on households. Past studies set the threshold level for catastrophic expenditure ranging from 5%-40% of total household expenditure that is spent on health (Russel, 2004; Ichoku, & Fonta, 2009; Ke, et al., 2010).

Onoka, et al., (2010) observed overall catastrophe of 28% and 40% at 20% and 10% threshold respectively of non food expenditure. Onwujekwe, et al., (2009) noted catastrophic spending ranging from 3.9% to 8.5% for the most poor and poor respectively at 5% non food. Onoka, et al (2011) noted 14.8% catastrophic level at 40% threshold and 36.5% and 32% using variable thresholds for poorest and richest while Onwujekwe, Hanson, and Uzochukwu (2012) observed 27% catastrophe at 40% threshold.

Concept of Payment strategies in Healthcare

The way a country finances its health care is a key determinant of the health of its citizenry (Olakunde, 2012). These can be grouped into public, private and donors.

Public payment strategies

Government helps individuals to cope with payment for health care by either subsidizing, sponsoring (exemption) or writing off the cost incurred (waiver), from general taxation and other government revenues (Nwankwo, et al, 2010; National Bureau of Statistics,2007). Many countries fund their health care system from general taxation. In Tonga, the healthcare coverage is universal and the incidence of financial catastrophe due to out-of-pocket spending is low. The government provides universal access to health services with minimal user charges. The government also funds special treatment overseas. The major payment mechanism in Tonga for healthcare is general government revenues (Somanathan & Hafez, 2006). United Kingdom, Canada, and USA operate tax-based funding (Stanhope and Lancaster, 2004). For example in U.S.A , the government is involved in the healthcare financing for population groups through the National health insurance scheme and social security services using the Medicare and medical system. The Medicare is obtained for clients aged 65years and above, disabled or those with permanent kidney failure. It covers the in-patient and out-patient hospital services, skilled nursing facilities, home health services etc. Medicaid services are specific to low income and needy, children, aged, blind and/or disabled, it is a joint federal and state project for all states and it covers in-patient and out hospital services, prenatal care, vaccinations, physicians, dental, nurse practitioner, nurse midwife services, skilled nurse services for persons 21years and older, family services and rural healthcare (Stanhope et al., 2004).According to the American Diabetes Association (2002), economic cost is 2-5 folds higher in people with Diabetes compared to those without it. This made WHO (2008) to advice Government to consider shift from user-fee towards

providing free healthcare services at primary level and to adopt other risk-pooling approaches such as social insurance and community prepayment scheme. Absence of free national health services in most countries of Sub-Sahara Africa means that the burden of DM is on patient or their immediate family (Mbaya, 2003).

In Nigeria, government funds healthcare through general taxation and with the adoption of the Bamako initiative in 1986 cost recovery guided most funding (Okoronkwo, 2004; Njoku, Ohagwu & Okaro 2005; Olakunde, 2012). However, less than 5% of the national budget is spent on health care. Soyibo,Olaniyan and Akanni (2009) note that government health expenditure as a proportion of Nigerian total health expenditure in 2005 was 26.02%. The per capita government expenditure on health accounts for 69.1% of total expenditure (Onoka et al, 2011). It is targeted at reducing the cost of care at public hospitals, waiver for paupers etc. Exemption policy exists for treatment of malaria in under-5s and pregnant women, Tuberculosis, HIV/AIDS (Federal Ministry of Health (FMOH, 2003), but there is no exemption for diabetes which has assumed an epidemic level with associated high economic burden. Onwujekwe, et al, (2010) decried governmentôs failure to design and implement targeted exemption mechanisms for the poor to cushion impacts of user fee. User fee falls within the broader concept of ñcosts sharingôô, a practice whereby beneficiaries contribute towards the cost of a public service (Witter, 2005). Onwujekwe et al, (2010) noted that social assistance and fee exemptions are not targeted at those most in need because of problem of identifying the eligible poor and administrative incapacity. Making services free at the point of delivery helps increase access to their utilization (WHO, 2008).

Private Healthcare Financing Strategies

Consumers of health services can fund healthcare through several means including out of pocket spending, insurance, community- based insurance scheme, among others.

Out-Of-Pocket Spending (OOPs)

The consumers of health services pay part or full for healthcare consumed from their earnings (Stanhope, et al 2004). They note that in Latin America, family pays up to 40%- 60% of healthcare out of pocket. Adam & Ke (2008) observed that out of pocket spending ranged from less than 6% in Namibia to over 60% in Cote dõivoire with an average of 40% in West African countries and methods employed to finance out of pocket spending include income, savings, reimbursement, sell-of-assets, borrowing etc.

Direct out-of-pocket payment by patients is used in India and Bamako initiative countries like Nigeria (Njoku, ohagwu & Okaro, 2005). Nigeria funds her health system from user fees from the patients (Njoku et al, 2005). 4% of Nigerian households spend over half of their total household expenditure on healthcare and 90.4% of this is out of pocket spending (Federal Ministry of Health 2006). Out-of ï pocket payment is the predominant healthcare payment mechanism in Nigeria (Tawiah, 2000; Ichoku et al, 2009; Olakunde, 2009; Onwujekwe, 2010). Soyibo,et al (2009) note that the burden of health expenditure rested mostly on households (private expenditure) which is more than 64% of total health expenditure in Nigeria. Onoka, et al (2010) observed that private expenditure accounted for almost 70% of total health expenditure and this implies that healthcare can place a significant burden on households. Onwujekwe et al (2010) lament the impacts of OOPs among poor household, as they are more likely to have higher occurrence of catastrophe in healthcare payment. Ichoku et al (2009) observed that the average Nigerian household spends 3-5% of its income on healthcare. They identified financial catastrophe as healthcare spending beyond a critical threshold percentage of pre-payment income or a state where households do not have absolute minimum income to spend on other consumption commodities at the post-payment period.

Out of pocket spending for patients with chronic illness amounts to great deal of money. Developed countries have moved from user fees to social insurance and tax-based models (Onwujekwe et al, 2010). Out-of-pocket spending for healthcare increased with the introduction of user fees in the health sector. In Nigeria with the adoption of Bamako initiative of 1986, the policy of user charges and cost recovery guided the operations of the public health sector in Nigeria. Although the Nigerian government in response to its very poor maternal and child health performance index provided exemption for treatment of malaria in under-5s and pregnant women, there is no exemption from payment for diabetes; an emerging epidemic and a major challenge to achieving MDG6 by 2015. The high proportion of health service paid out of pocket may put families at risk of financial catastrophe while financing strategies that rely less on individual payment at the point of use and allows greater degree of risk sharing enhances access to care and reduces unfavourable outcomes (Onwujekwe et al., 2010)

Community-based prepayment schemes

This is a form of decentralized health risk sharing in which individuals or households in a community pay certain amount of money or in-kind contribution. It is voluntary and informal (ñIsusuò). They are particularly important in meeting immediate healthcare needs of the contributors in the rural communities (Okoronkwo, 2004). The benefit can be in form of payment for healthcare or emergency transportation to health facility. Community-based prepayment scheme is used in many rural African communities and in China. Berman et al., (2010) observed that financial mechanisms such as pre payment and risk pooling can help make health services available and affordable for all.

Adam et al (2008) recommended formal prepayment scheme and social protection network to mitigate long-term effects of illness on household wellbeing and support poverty reduction. They reported that Burkina Faso, Ghana and Senegal have a history of community based

insurance (micro finance initiative including savings, credit investments and community involvement. The patients rely on social capital of communities.

Health Insurance

Health insurance is a mechanism for protecting people against high cost of healthcare by making pre-payment prior to falling ill. It aims at guaranteeing unhindered access to healthcare services to the insured person at the time of illness, when medical care is needed without having to pay fully at the time of using the service (Okoronkwo, 2004).

In employer-sponsored health insurance, sometimes payment for uncovered services and pharmacy charge are not captured when cost of illness are calculated (Peele,Lave & Songer, 2002). In view of this, it is important that in investigating the economic burden of diabetes, the people who are living out the experience and incurring the costs should be involved.

Health insurance can be private, employer-sponsored, government insurance or social insurance like the national health insurance scheme (NHIS). Many of the expenses incurred by individual patients can be covered by health insurance. Limited availability of private medical insurance in most Sub-Sahara Africa means that the burden of DM is on the patient or the family (Mbaya, 2003).

(Adam et al, 2008) report that formal health insurance is rare in developing countries and many households lack access to formal credit and savings. Social insurance exist in few African countries like Ghana, Kenya and United Republic of Tanzania in a small scale while Zambia finance health care through health insurance which is not popular in Burkina Faso, Namibia and Swaziland. Reimbursement from an insurance plan is used as coping mechanism. However, healthcare cost increase also increases the insurance premium and co-payment. At government level, it decreases the resources that might benefit the individuals. In addition, many of the out-of-pocket expenses are not reimbursed.

Absence from work as a result of chronic illness may jeopardize job security and income (Kraut,Walld, Tate, and Cam 2001; Stanhope et al 2004). Diabetes costs were paid through employer-sponsored health insurance in Pennsylvania (Peele et al 2002).

In Athens Greece, for instance, the insurance of the civil sector for individuals with diabetes covers expenses of acquiring a device to measure blood glucose up to the amount of ú117.39 without contribution by the insured (Somanathan et al., 2006)

Tonga finances her healthcare through social health insurance, community based insurance, private and household insurance, while mandatory social insurance is used in Germany, Japan and Argentina (Somanathan, et al 2006).

In Nigeria, National health insurance scheme (NHIS) was introduced to ensure that qualitative, cost effective and appropriate care gets to majority of the population and that funds are available for health care delivery services. It was adopted to improve the healthcare of Nigerians at a cost the government and citizens can afford. For a token fee paid regularly, the contributors and their dependents are guaranteed good quality healthcare when ill. The contributors are expected to register with a health management organisation (HMO) and thereafter with a primary health provider supplied by the HMO. Identification card is issued to enable easy access to care from primary provider. HMO makes payment for services while the contributor makes co-payment of 10% of total cost at the point of service (NHIS, 2005). Soyibo et al, (2009) report that national health insurance registration of civil servants and their dependents was 1. 5million in December 2006. Unfortunately, only about 3% of Nigerians are insured (Ubong, 2009). Olakunde (2012) identified health insurance as a major payment mechanism in Nigeria.

Deferred payment and In-kind payment

Payment for goods or services received could be made in future upon agreement between the giver and recipient of such services that is the payment is postponed to a specified date when the recipient anticipates he will be able to pay. In kind payment is a strategy where the recipient of care makes payment by bestowing his/her labour. It entails working or giving service in exchange for cost of a specified healthcare service. Deferred and in-kind payments have been used as payment strategies in northern Nigeria (Nyango et al., 2010).

Donors

Non Communicable Diseases are not only the domain of medical experts, their control involves a wide range of disciplines, civil society, actors, ordinary people, NGOS including the recently established NCD Alliance of the International Diabetes Federation (IDF). Research from Centre for global development showed that major donors, the USA, World Bank, UK, Department for International Development, have been reluctant to provide grants and loans to tackle NCDS having not seen the direct link between NCDS and poverty or development (Sridhar, 2011)

Estimated less than 3%of total donor funding goes to addressing NCDS and a Lancet study 2005 revealed that NCDS fund from four biggest donors was estimated at $3 per death annually. Olakunde (2012) noted donors as a strategy for health care financing in Nigeria. There is need to convince donor partners to support the mitigation of these dangerous health trend in the communities and for national government to adopt the UN resolution, speed up policy development, indicators, targets and track progress and financing mechanisms (Bongani, Mayosi & Grote, 2011)

Non-Governmental Organizations (NGOs)/ support Agencies.

NGOs may take up the challenge of caring for people living with diabetes (PLWD), either in form of providing diabetic supplies, diabetic self management programs or providing social support. For example lions club international initiative, funds camps for diabetic children and programs that improve access to comprehensive diabetes treatment for underserved population. Other donors include the United Nations, Centre for Global Development and the WHO (Gibala, 2009). Contribution of Development partners to health care financing in Nigeria was ₦ 36.30 billion in 2005 (Soyibo, et al., 2009).

Payment Coping Mechanisms

Adams and Ke, (2008) define payment coping mechanisms as short term strategies used to cope with the cost of medical care. It provides information on how individuals and households respond to unpredictable illness that diminish the health status and leads to poverty because individuals are often affected by both payments for medical care and income losses from inability to work (health shock).

Payment coping mechanism consists of non- income financing of healthcare; saving, borrowing and selling of assets (WHO, 2008). They noted that such expenditures generate transient poverty for household that finance such costs using income and hidden poverty for those who finance healthcare costs with coping strategies. It is more of a welfare measure of the loss of household utility created by having to finance catastrophic cost using short term sacrifices of wealth that leave the individuals vulnerable to future health shocks. Households cope differently in different context in the face of economic burden of illness (Adam, et al., 2008). Wiley and sons, (2008; Oyakale and Yusuf 2010) observe that financing health expenditure through coping mechanisms leads to hidden poverty because total household expenditure is inflated by financial coping strategies and necessary consumptions is temporarily sacrificed to pay for healthcare. Studies reveal that spending on food and

education are sacrificed after illness and that borrowing can be at high interest, assets may be lumpy (large discrete amount) and depleting them may sacrifice future income and with drawing children from school can reduce their human capital and push the household into deeper poverty (Chuma and Molyneux, 2007; Adams and Ke, 2008; Oyakele & Yusuf, 2010) The mechanisms include, but not limited to, the following:

Appeal for Charity/Begging

Appeal for support may be made to charitable individuals/groups to contribute towards treatment of individual(s) with particular health problems. This appeal could come through the mass media creating awareness of the need for support. It may come through group of individuals who advocate for such supports using photograph of the person involved and presenting the picture of the problem. They often use public address system in the streets, markets or public gathering like churches to solicit for support. For example a diabetic gangrene requiring amputation; an organisation may carry a photograph showing the gangrenous leg of a diabetic and using megaphone solicit for assistance from individuals and groups. Media houses can also raise advocacy for support on behalf of the diabetic. Begging could also be used. The diabetic stands at strategic places in the streets or gets to individual(s) to ask for support to help them purchase their drugs (insulin). Individuals use appeal for support from good-spirited individuals, members of the public, and begging among others to cope with payment (Oyekale, et al., 2010)

Borrowing/loans

This is a mechanism where individual(s) obtain a resource to meet healthcare need to pay back when he/she is able. Borrowing can be formal or informal. Informal borrowing exists where the resources are given out without interest but formal one attracts interest (Oyekale et al, 2010). Borrowing, as a coping mechanism, often attracts high rate of interest on loan,

especially when they borrow from professional money lenders (Tawiah, 2000). Borrowings mainly from friends and other families and taking out a loan using collateral especially for low and middle income households and those with high in-patient expenses are used as coping mechanisms (Adams et al, 2008). They noted that the highest income is less likely to borrow or sell assets and that 30% of households in West Africa finance out of pocket spending through borrowing. Kaleml (2006) asserts that coping mechanisms are not costless. Kupur (2006) and Onwujekwe et al, (2010) also identified borrowing as payment coping mechanism.

Diabetes Association/Social Support Network

Diabetics may raise a social support network for themselves. They pool their resources together and earmark it for specific uses in their management. For example, transport to hospital in emergency, support for purchase of drug (insulin), in-patient treatment etc. each diabetic is expected to contribute into this common purse and to benefit as agreed by the association. On the other hand, social support groups like the age grade, concerned citizens, friendship network may take as one of their objective, supporting people when ill. They raise fund and hypothecate it for support for example diabetic care. When need for assistance arises either from among their membership or receipt of appeal to support diabetic treatment they readily support part or full treatment (Adebayo, 2008)

Sale of Assets

In short terms, when medical bills exceed a householdôs income, households sell assets (Adams et al, 2008). They recognised sale of assets as a method employed to finance out-of-pocket spending and that sale of assets is popular in West Africa but not common in Zambia, Namibia and Swaziland but about 68% of patients in Burkina Faso cope by selling assets. Distress selling of assets (land, household mobile assets, labour) is a coping mechanism in

Northern Nigeria (Oyekale and Yusuf, 2010). Onwujekwe, et al., (2010) also noted sale of household assets and sale of land as coping mechanism in South-East Nigeria, though sale of land is said to be uncommon.

Gifts as a payment coping mechanism

Individuals or groups may be moved with compassion to give cash or kind gifts to diabetics to support treatment. Most times it comes from friends and relations who are aware of the personôs problem/need. Gift is used in several sub-Saharan and south East Asian countries to support health care. Gifts from friends, relatives and neighbours are payment coping mechanisms in Nigeria (Tawiah, 2000; Oyekale, et al., 2010)

Savings and Cutting Down on Minimum Consumptions

Individuals could fall back on savings earmarked for other needs to cope with healthcare payment (Tawiah, 2000; Kupur, 2006). Tawiah also noted personal savings as a means of mitigating the effect of high cost of healthcare and cutting down on personal consumption of certain goods as a coping mechanism for payment. Incomes and savings were noted as popular coping mechanisms in Zambia, Cote dôivoire, Chad and an average of 40% of West African countries cope with healthcare payment through it (Adams & Ke, 2008). In developing countries with few government safety nets chronic conditions like Diabetes impose heavy cost over time if regular treatment is required and if the sick are incapacitated. This high cost triggered either cost prevention strategies (do not seek treatment or abandon treatment or adopt relatively risky asset strategies, settle for cheaper alternatives) (Russel 2004; Oyekele et al., 2010).

Tawiah (2000), writing on ways of raising funds in West African countries, of which Nigeria is one, included among other things, falling back on personal savings from income, cutting down on consumption expenses, borrowing especially from friends and relatives. It has been

observed that borrowing often attracts high rates of interest on loan, especially when they borrow from professional money lenders. Okoronkwo, (2004) add that saving can mitigate the impact of lost earnings as a result of not being able to work or to allow the cost of health care to be easily met. Income, wealth holding, health insurance and future income through borrowing have also been identified as coping mechanisms for paying for health care (Tawiah, 2000; Oyekale, et al, 2010). The community health insurance in the form of ñisusuò could be used to cope with health care payment because in return the contributors are entitled to free outpatient and in-patient treatment. The health insurance is a mechanism for protecting people against high cost of healthcare by making pre-payment prior to falling ill (Okoronkwo, 2004).

CONCEPTUAL FRAMEWORK FOR ECONOMIC BURDEN, PAYMENT STRATEGIES AND PAYMENT COPING MECHANISMS OF DIABETICS: COST-OF – ILLNESS (COI) FRAMEWORK

The conceptual framework related to this work is the cost-of-illness (COI) framework. It is a model that describes the costs of a specific disease using economic analytical approaches. For study of economic burden of diabetic patients this model becomes necessary to elicit the direct and indirect costs associated with diabetes. The two approaches adopted for this study are: ðbottom-upò approach for the direct costs and human capital approach for indirect costs (Songer & Ettaro, 2000).

In human capital approach, indirect costs are valued on the basis of productivity losses. Quantification of lost earnings or output is based on the assumption that disabled persons, if they were able to work, will have the same employment experience as the general population. Indirect costs related to time absent from work due to acute illness, time traveling, waiting time in hospital, premature retirement or premature mortality considers the value of lost productivity in the subsequent years of life that will be expected had retirement or death not

occurred. Calculation is based on the number of disease-specific deaths, the survival experience of the general population, earnings, employment rates and productivity rates (William, 2002)

ñBottom-upò approach derives the direct costs by aggregating the cost units of services performed at each encounter with the health system within a given period of time. They include costs of drugs, investigations, admissions, consultation etc. It uses cost of service estimate and applies this data to the total number of health encounters related to the disease (diabetes) to arrive at an estimate of the health cost of the disease (William, 2002). These costs have attendant burdens/problems which patients need to cope with as their treatment progress. The payment coping is focussed on short term payment methods/strategies used by the diabetics in the course of their treatments to meet up the economic demand of the illness. Below is a schematic representation of patients- based economic burden of diabetes consisting of direct and indirect costs which when articulated amounts to total cost of diabetes care, with need to device payment coping mechanism. It is expected that this framework would help in capturing the necessary data from the diabetic patients on their economic burden and their payment coping mechanism.

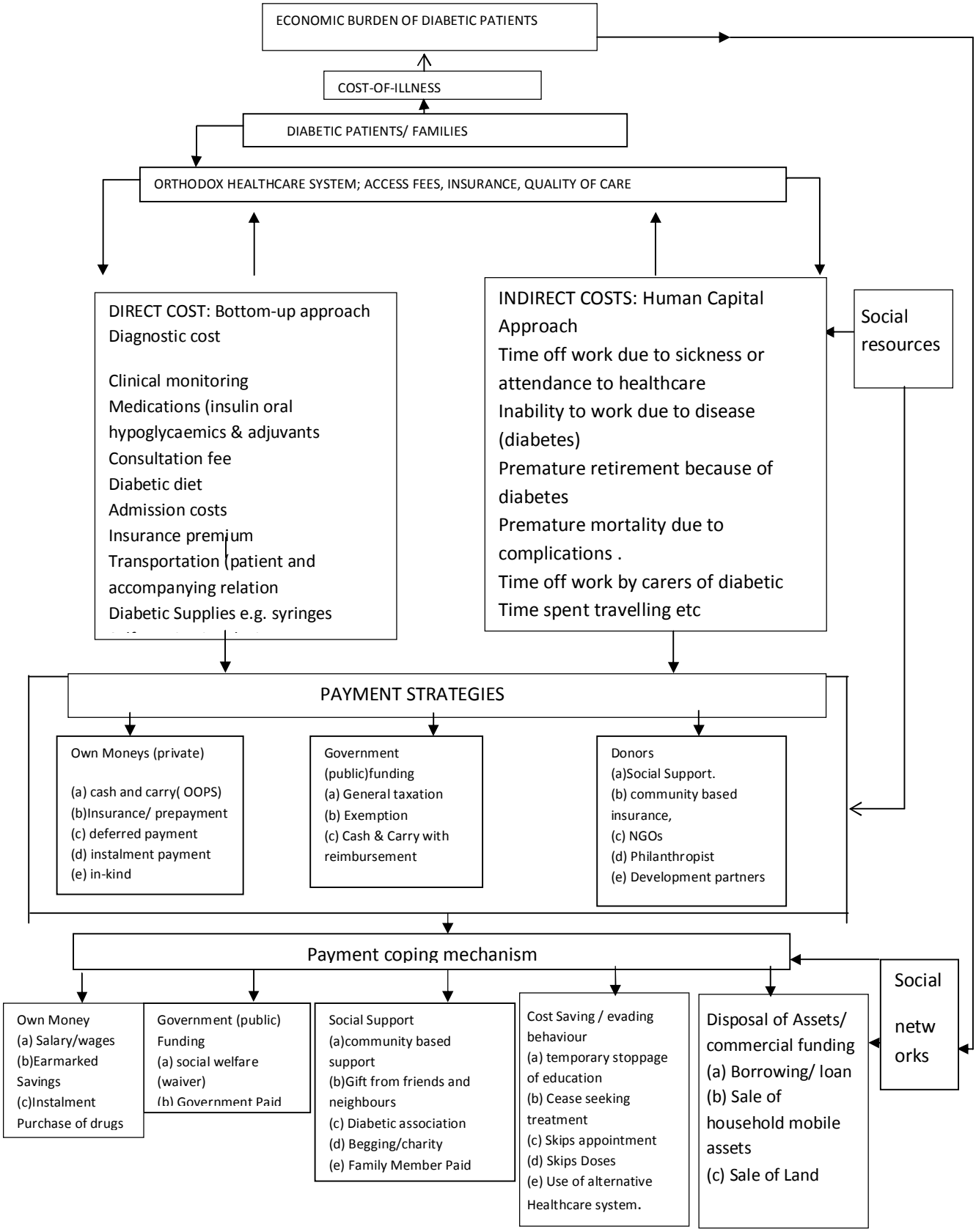

FIGURE 1: SCHEMATIC REPRESENTATION OF COST-OF-ILLNESS (COI) FRAMEWORK , ADOPTED FROM RUSSELL, S (2004)

Application of Conceptual Framework

This framework was adapted from studies that have investigated the cost of illness, coping strategies and economic burden of patients/families (Songer & Ettaro 1998; Rice, 2000; William, 2002; Russell, 2004 & Akobundu, 2006).

Patients/families when challenged with DM seek quality care from orthodox health care facilities using access fees. Illness costs are incurred by diabetic patients/ family care givers directly and indirectly (economic burden of DM). The direct costs are incurred from services received while the indirect costs represent the monetary value of productive man hour lost travelling to receive care, absent from work by patients and family careers, premature retirement etc. The diabetic patients/families live in environment which has social resources (policies and programmes) and network of support for healthcare payment (payment strategies) and for coping with payment of DM costs on short term when 10-40% of their subsistence income is exceeded. These payments could be made through several strategies like private funding (OOPS, Insurance etc), Public funding (Government pays; exemption, general taxation etc) or donor (social support, NGOs, community based insurance etc). Because the social environment of diabetics in Nigeria is laden with poverty, user fee is operational and they visit the health facilities more frequently, they could incur catastrophic costs and may use short term measures to cope with payment. They could also mobilize resources within and outside the family (social network) to cope with payment for DM. Such coping mechanisms include but not limited to own money (earmarked savings, salaries and wages etc), social support (gifts from friends, community support etc), disposal of assets (sale of household assets, land), Government pays (waiver, concessional release on special visits), use of perceived cost saving behaviours (skipping appointments, alternative healthcare system etc). If DM patients finance healthcare with unfavourable coping mechanisms like

disposal of assets, borrowing or stoppage of childrenôs education among others they can be pushed deeper into poverty as these could increase costs indirectly and compromise the future economic value of the children. Some analysts assume that a cost burden greater than or equal to 10% of income is likely to be catastrophic for diabetic patients/household. By implication, it is likely to force them to cut their consumption of other minimum needs, trigger productive asset sales or high level of debts and reduce access to health care and subsequent early complication of diabetes. Prescott (1999); Ransome, (2002) and Russel (2004) note that the 10% is arbitrary because it may not be catastrophic for high income households that can only cut back on luxuries. This study therefore assumes that 40% expenditure on diabetic care could be considered as catastrophic but considering socio economic inequalities it would also assess catastrophic expenditure at 10% and 30% for the poorest socioeconomic status group and the least poor socioeconomic status groups respectively.

Empirical Review

The variables economic burden, payment strategies; their associated financial catastrophe and payment coping mechanisms were reviewed globally and in Nigeria.

Economic Burden of Diabetes

Peele, et al., (2002) looked at the problem of economic cost of diabetes in an employer sponsored Health insurance using 20,937 DM patients. Health Insurance billing data was used to calculate employer expenditure and consumer out ï of ï pocket payments. They used personal level descriptive analysis; compared the expenditure with other chronic conditions like heart disease, cancers, arthritis etc using one-way ANOVA, Wilconxonôs rank-sum, median, Kruskal- Wallis testand noted that those with diabetes were not more expensive for employerôs insurance plan. Diabetes was observed not to be more expensive either for

consumers or their employers sponsored insurance plan. Their total covered charges for medical-surgical services (Hospital Physicians, dieticians, and other covered licensed healthcare providers as well as laboratory devices but excluding pharmacy services) and mental healthcare expenditure for total covered charges for mental Health Services. Out-of-pocket payment is the difference between covered charges for covered services and the actual insurance plan expenditure and reflected deductibles and cost sharing in the plan. They presented average annual health expenditure for individual with diabetes as $430. This is said to be higher for all people who use healthcare. Individuals with diabetes also had higher out of pocket expenditure of $365 but they paid only18% because of insurance policy taken. They also noted that payment of uncovered services and pharmacy were not captured. This is a problem for the patient who will contribute premium, pay part of their agreed amount per contact with health facility and yet pay for the medication cost out-pocket.

Hogan, Dall, Nkolov, American Diabetes Association (ADA), (2002) estimated the Economic costs of DM in the US in 2002 from the general population using National Health Survey data ; compared the total per capita medical expenditure for those with and without diabetes. The direct and indirect cost attributable to diabetes in 2002 was put at 132 billion dollars. Direct cost $91.8 billion. It comprises $23.2 billion dollars for diabetes care, $24.6 billion for chronic complications attributable to diabetes and $44.1 billion for excess prevalence of general condition. In-patient days (43.9%), Nursing Homecare, and office visit 10.9% constituted the major expenditure group by service setting. 51.8% of direct medical costs were incurred by people > 65years. Indirect cost totalled $39.8 billion. U.S.A expenditure amounted to $865 billion of which $160 billion was incurred by people with diabetes per capita medical expenditure was $13243 for diabetes and $2560 for non diabetics. $132billion is taken to bean underestimation since there is an intangible cost- pain, suffering, care provided by unpaid givers and several area of healthcare spending not communicated to

healthcare practitioners. They concluded that diabetes imposes heavy problems to society and diabetic patient/family in particular.

Solli, et al, (2010), in a survey of cost of diabetes in Norway, using a prevalence approach studied 584 DM patients. Data were collected using researcher administered questionnaire and secondary data from National registers and survey reports. The authors observed the total costs of DM were ú293 million which represented 1.4% of total health care expenditure, pharmaceuticals ú95million (32%) disability pension ú48 million (16%), medical devices ú40 million (14%) and hospital admission ú21 million (7%). Indirect cost (loss of productivity from absenteeism from work) accounted to ú70.1 million (24%) of the ú293 million and included sick-leave (ú16.7 million), disability support (ú48.2 million) and others ú5.3 million. If all diabetes related hospital stays were included (primary and secondary) total costs amounted to ú535 million, about 2.6% of health care expenditure in Norway.

Dafogiannil et al, (2004) in an epidemiology survey of 608,000 diabetics using data from International Treasury survey 1990, estimated the cost of out- patient care in DM in Athens (Greece). Non Insulin treated patients cost $29.49. In women 65years of age, a higher monetary cost per patient was $39.74, while a lower cost of $31.07 was observed in men under 65years. Cost of intensified treatment (4 injections per day) was observed to be 3 times higher than the cost of conventional forms of insulin treatment (1 or 2 injections) a day. Average medical and non- medical costs per patient per day was $251.4. Average cost of type2 diabetes each year was $2257. An economy average of hospitalization cost was $1,628,000.

Chang, (2010) studied cost of type2 diabetes in Taiwan and reported a total cost of the disease borne by each patient as U.S. $3065.7 per year. The total cost to Taiwan was approximately $2.96 billion equivalent to approximately 0.8% of gross domestic product of

Taiwan. The Taiwanese national insurance alleviates approximately one third of the burden for the patients.

Liaquaat, Khowajat, Khuwaja and Cosgrove (2007) in a prevalence based cost of diabetes care in out- patient Clinic of Karachi, Pakistan, estimated the annual mean cost of DM care on 350 DM patients using a questionnaire. Cost for each patient was US $ 197. Medication accounted for the largest share of direct cost (46%), followed by laboratory test 32%. Increased age, the number of complications and longer duration of disease significantly increased burden of cost. Comparing cost with family income they found that the poorest segment is spending 18% of total family income on diabetes.

Kiriga et al, (2009) in a study of economic burden of diabetes in the WHO African Region, from 46 countries grouped the countries into three based on their gross national income per capita as: greater than Int. $ 8000, Int. $ 2000 ï 799, and less than Int$2000. The economic loss of diabetes stood at Int. $ 25.51 billion (PPP). Approximately 43.65%, 10.03% and 46.32% of that loss was incurred by groups, 1, 2, 3 countries respectively. This translated to grand economic loss of Int. $11,431.6, Int$4,770.6 and Int.$ 2,144.2 per diabetic case per year in the three groups respectively. Nigeria was grouped with the countries with less than 2000 gross national income per capita, therefore economic burden was estimated to be Int.$ 2,144.2 per diabetic case per year. They concluded that diabetes imposes a substantial burden on West African Region.

In descriptive study of treatment seeking behaviour, cost burden and coping strategies among rural and urban households in costal Kenya by Chuma, Gilson and Molynoux (2007) using questionnaire, it was observed that the cost of chronic diseases vary by type, and that ill health disproportionately affects the poor and that when they seek care they spend greater proportion of their income (more than 10%) on treatment. Rural households lose income or non-income days (indirect cost) as compared with urban residents.

In a descriptive cross sectional survey of economic burden of illness for household in developing countries (rural Northern Nigeria) focussing on malaria, TB and HIV/AIDS, Russel, (2004) observed annual mean cost of illness for Nigeria as 7% of household income noted that in poor-resource settings, illness imposes high and regressive cost burdens on patients and their families.

Ogbera, et al, (2006), in an assessment of the disease burden of foot ulcers in patients with diabetes attending a tertiary hospital (LUTH) in Lagos, derived the direct economic cost of diabetic foot ulceration from the costs incurred from the patients; in-patient days, tests, medications, surgery and other services. The total number of diabetics in LUTH was 1500, diabetic foot ulcer 97(9.5%), case fatality on diabetic foot ulcer 53% was more than the proportion of medical admissions due to diabetic foot ulcer (P=0.007). The mean cost of successfully treating a patient of diabetic foot syndrome was N180,581.60. The total cost ranged from N20, 400 to N278, 029.00. Drug accounted for majority of the costs (46.9%).

The financial costs of treating Nigerian in-patients with schizophrenia and diabetes in a tertiary hospital in Nigeria were derived in a work done by Amoo and Ogunlesi (2005). They used 57 in-patients from each group who met the inclusion criteria, matched for age and sex, and followed them up for 6months. Weekly assessment of the cost of treatment were done from admission to discharge using the Proforma which took cognisance of aspects of direct and indirect costs for patients and relatives of both groups. Data was gathered through clinical measurements and interview. A mean monthly direct cost of schizophrenia of N9, 882.00 and indirect cost of N3, 604.00 were noted. For diabetes, direct cost stood at N7892.00 and indirect cost of N1, 488.00. The cost of schizophrenia per admission of N11, 337.00, was higher than that of diabetes of N8, 571.00. However, the mean direct cost of diabetes per week of N4494.00 was significantly higher than N1, 011.00 for schizophrenia. The mean indirect cost for diabetes per week was N406.00 while the mean total cost for

diabetes per week was N4, 910.00. The cost of medication ranked highest in all items of cost. Onwujekwe, et al., (2010) in a survey of determinants of out of pocket spending and strategies for coping with payment for health care, using 3 rural areas and 3 urban areas in Enugu and Ebonyi states south east, Nigeria reported that the monthly cost of treatment ranged from N44.70 in rural areas to N1, 477.00 for the urban. Transportation was N35.30 in urban and N162.30 for the rural areas.

Catastrophic Health Expenditure

Doorslaer, Donnel,Eliya and Somanathan, (2007) studied catastrophic personal payment by analysing the size of personal financed health care expenses as a proportion of household budget in 14 countries in Asia. The analysis showed that 3% to 7% of all households in Bangladesh, China, India, Nepal and Vietnam spend more than 40% of household expenditure excluding food on out- of- pocket healthcare payment. It contradicted previous assertions that poorer people spend a greater share of OOPS on healthcare. They observed that drug payment disrupt household living standard. 70% of OOPS goes to drug and that personal spending on health increases with total household consumption. It was also noted that catastrophic payments are widespread often associated with common illnesses.

Mudur, (2007) on catastrophic personal payment for healthcare in Asia, it was noted that individual catastrophe was of highest incidence. It was said to be worse in Bangladesh, China and India. It was observed that patientsô own OOPS accounted for 80% of healthcare and households spent more than 40% of non food expenditure on healthcare. The relative lower incidence of catastrophe in Thailand, Sri Lanka and Indonesia and high income countries like Taiwan was attributed to effective public health services and low or absence of user fees.

Wiley, et al., (2008) studied how health payment impacts on consumption and poverty in India, observed that coping strategies financed as much as ¾ of the cost of care. Payment for healthcare exceeds 10% of total household expenditure for 30% of households but less than

4% sacrificed more than 10%of current consumption to accommodate the health care spending.

A cross sectional household survey of catastrophic health expenditure experienced by 1128 households with different socio-economic status in South East Nigeria by Onoka, Onwujekwe, Hanson and Uzochukwu, (2010) using Health and expenditure pictoral diary, revealed that both uniform threshold (40%, 20%,10%) and variable threshold of 40% for least poor and 6.8% for the poorest were used to study 4 local governments in Enugu and Anambra States. At a variable threshold level of 5% and 40% ratio of food expenditure different socio economic status groups were used as weights to determine the level of catastrophe appropriate for various socio-economic status groups. 15% of household studied, experienced catastrophe when the threshold was set at 4% non- food expenditure. At 40% threshold the highest proportion (23%) was among the poorest quintile (q1) and difference with other group was significant. For least poor quintile (q5) less than 8% experienced catastrophic costs. Using a threshold level of 20% and 10% non food expenditure the overall level of catastrophe noted was 28% and 40% respectively. They observed that at these levels, the richest household had the lowest proportion of catastrophe while the second quintile (q2) had the highest. Reanalysing the data with variable threshold which is lower for poorer households that runs from 5% for the poorest to 30% for the least poor the level catastrophic spending were 45% for the poorest and 12% richest. When the variable threshold sets the richest quintile at 40% and poorest household at 6.8%, the percentage of household facing catastrophic expenditure were 8% and 43% respectively. They noted that using a fixed threshold to measure catastrophe irrespective of household income or expenditure fails to capture how absolute level of expenditure that remains after payment for healthcare differs among groups of different income levels. They asserted that use of fixed threshold will

underestimate the degree of inequality in the distribution of catastrophe between socio-economic groups.

Onoka et al, (2011) examined catastrophic health expenditure in Nigeria at variable and fixed thresholds using household consumption expenditure diaries. They observed 14.8% catastrophe at 40% non food expenditure with 22.6% and 7.6% of the poorest and richest respectively experiencing catastrophe. Using variable threshold of 5% and 29,6% for the poorest and the richest respectively the catastrophic level were 44.7% and 12.0% with the overall catastrophe as 36.5%. Catastrophic expenditure was noted to be high among the poorest quintile in Nigeria and that use of variable threshold to measure catastrophe gave a higher overall and disaggregated levels of catastrophe. They called for urgent re-visitation of the current health financing strategy. Government should adopt financial strategies that rely less on individual payment at the point of use and allow greater degree of risk sharing and other forms of risk protection for the poor.

In a survey of cost of illness for household in rural Nigeria using HIV/AIDS, Malaria and TB, Russell, (2004) reported that in poor-resource settings, illness imposes high and regressive cost burdens on patients and their families. The annual mean cost of illness for Nigeria was 7% of household income above which households cut consumption of their basic needs because of inability to pay out-of-pocket.

A survey of catastrophic health care financing and poverty, empirical evidence from Nigeria by Ichoku & Fonta, (2009) using 7,667 households and data from 1999 general household survey of Federal of Office of Statistics of Nigeria, revealed that average household spends 3-5 % of its income on health care and that health financing system in Nigeria is a potential channel for impoverishment. It also noted that healthcare financing beyond a critical threshold percentage of pre-payment income (>10%) of household income as catastrophic.

Payment Strategies

Kapur, (2006) in a descriptive survey of economic analysis of diabetes care in an Indian hospital noted that their financing sources included family/ personal resources, loans, insurance, savings and borrowing.

Onwujekwe, et al, (2010) in a survey of determinants of out of pocket spending and strategies for coping with payment for health care, using 3 rural areas and 3 urban areas in Enugu and Ebonyi states south east, Nigeria (386 and 330 urban and rural respectively), observed the cost of healthcare to be high for an average Nigerian who most times pay out-of-pocket. They noted that the observed lack of difference in social economic status in the use of out of pocket spending implies that the poor are not protected and are suffering from hazards and uncertainty of paying for health care when ill. Soyibo (2004) notes that OOPS accounted for 66.5% of total health expenditure in 2000 and 74.4% in 2004 and that the household OOPS as a proportion of private health expenditure has been more than 90% in Nigeria from 2003-2005. OOPS is about $22.5 per capita in USA which accounts for 90% of total household expenditure and half of those who could not access care did so because of its cost. The pro-poor payment system such as waivers and exemptions have been adopted in Vietnam, Guatemala, India, Mexico, Nepal and South Africa are in response to the negative impact of user fees (Onwujekwe et al 2010).

Unfortunately, the assessment of the National Health Insurance Scheme (NHIS) after four years in Nigeria revealed that less than 3% of Nigerian population is covered (Ubong Ukpong, 2009). However, it is reported by Awe and Sanusi (2009) that from their assessment of NHIS among health care consumers in Oyo state, 65% of the respondents who have received treatment under the programme wanted it to be discontinued indicating that people have little or no hope in the programmes.

In a household survey of how people of different socio economic groups cope with payments in urban (Awka, Nnewi and Onisha) and rural (Njikoka, Aguata and Ogbaru) areas of South-East Nigeria, out-of-pocket spending was identified as the major strategy for payment. It was suggested that in-order to reduce catastrophic spending, policy actions to reduce the amount of money paid out-of-pocket should be instituted and out-of-pocket spending be limited to proportion of income that society defines as catastrophic. Promotion of health insurance which is an efficient means of making medical care affordable and abolition of user free for general population especially for the poor/vulnerable groups should be advocated (Onwughalu, et al., 2009).

In another study of socio-economic differential in costs and payment strategies for primary health services in rural/urban communities in South-east zone Nigeria, it was observed that user fee without reimbursement was the commonest payment strategy, followed by instalment payment (Onwujekwe & Uzochukwu, 2005). They suggested mitigation of the effect of user fee through improved provision of healthcare in rural areas and initiation of exemptions for the poorest group.

Payment Coping Mechanism

Adams and Ke, (2008) in a cross-sectional study of coping with out-of-pocket payment for healthcare payment in 15 West African countries (Burkina Faso, Chad, Congo, Cote dôivoire, Ethiopia, Ghana, Kenya, Malawi, Mali, Mauritania, Namibia, Senegal, Swaziland, Zambia, Zimbabwe) using data from World Health survey 2002 -2003, reported that the countries are low-income (>80% live with less than $1 a day) except Congo, Namibia, Swaziland, who are lower middle income. It was also noted that the countries vary in income, government and total health expenditure, out-of-pocket for health and average life expectancy. Using data from 2002-2003 World health survey, it assessed how 2754 - 5276 households (range Congo -Malawi) had financed out of pocket in the previous year, it found that most African countries

health financing system is too weak to protect household from health shock. Borrowing and sale of assets were common but more strongly among lower income quintilesô and highest income are less likely to borrow and sell assets. Household with higher in patient expenses borrow and sold assets significantly compared with out- patients except in Burkina Faso, Namibia and Swaziland. 23% in Zambia coped with borrowing and selling assets while 68% in Burkina Faso didsame. Average out-of-pocket spending in the 15 countries was 40%. Methods employed to finance out of pocket spending were borrowing, sale of assets, savings, reimbursement from an insurance plan, altered labour allocation decision, health insurance (rare) and formal prepayment mechanism was suggested.

A study of cost burden and coping strategies among rural and urban Kenyans: An equity analysis by Chuma et al, (2007) observed that to meet the cost of illness, poor households adopted coping strategies that are potentially risky for their future welfare. Such strategies identified included, selling critical assets and borrowing (sinking into inescapable debts). They reported that exemptions and waivers which are pro-poor have not been able to protect the poor.

Donnell, Doorslaer, Huq and Eliya, (2007) studied catastrophic expenditure on healthcare: comparative evidence from Asia and reported that consumption is positively correlated with the incidence of catastrophic payment. They noted that household cope with healthcare payments from saving, borrowing, sale of assets which resulted to rise in total household expenditure and its healthcare share.

Nwankwo et al (2010) in a cross sectional descriptive surveys of factors influencing diabetes treatment outcome in Imo state, south east Nigeria, using face to face interview, studied 47diabetic patients from two health facilities noted that 14.9% the family members/friends paid, 68% paid (out of pocket), while government paid for 17%. They observed that patient income was very significant in their inability to procure diabetic supplies, medications and

doctorôs visits for which they needed support from friends/relations to cope with care. They concluded that annual income of $300 is even lower than $2 per day reported by the population reference bureau of 2008. Diabetes is a very expensive health condition for high income earners to manage let alone the poor.

A cross sectional study of multi-dimensional poverty of shockï exposed household in rural Nigeria and coping mechanism by Oyakele and Yusuf, (2010) using 77,400 individuals from 100household units using 2006 Core Welfare Indicator Questionnaire of National Bureau of Statistics, identified the following payment coping mechanisms: Most household heads worked on farms that belong to other households to earn income, distress sale of asset, reduced intake of food to conserve funds, interruption of education of their children, informal and formal borrowing, charitable support from churches, gifts from friends, neighbours, taking up other pieces of job and begging on the streets.

Onwujekwe et al (2010) in a study on strategies for coping with payment for healthcare in South East Nigeria, identified the following as coping mechanisms, Sale of household assets, sale of land (uncommon), instalmental payment, borrowing, reimbursement, off front payment and in- kind payment.

Summary of literature review

Related literatures were reviewed on economic burden, payment strategies and payment coping mechanism of diabetes mellitus. It highlighted the concept of diabetes mellitus reflecting its aetiology/risk factors, types, its classic signs and symptoms, diagnosis, epidemiology and its complications that have implications for quality of life and costs. International Diabetes Federation (global) guideline on diabetic management using their three levels of care in 19 areas guided review on diabetic management. Economic burden and payment coping mechanism in diabetic care were reviewed globally and in Nigeria. Conceptual framework used for the study of economic burden of diseases was the cost-of-

illness framework. ñBottom-upò and human capital measurement approaches were adopted for the study of direct and indirect costs of diabetes respectively. From literature review there were very few patient-based cost of illness studies on the economic burden of diabetes; presenting the full weight of the economic burden borne by the patients who live with and experience the condition in Nigeria. Some of these were very specific to patient groups. For example Ogbera et al (2007) dealt on DM foot ulcers and used in-patients while Amoo and Ogunlesi (2005) estimated the costs of DM and compared it with that of Schizophrenia among in-patients

The other existing COI studies in Nigeria were general, malaria or primary health care. The cost of illness for household in rural Nigeria, using a household survey looking at costs of Malaria, HIV/AIDS and TB, was done by Russel (2004). Two of these DM COI studies were done in the Western Nigeria, one in the North but none seen in the South-East Nigeria.

Most studies estimated the cost of illness from national population and health management organization data not from the people who are living with the disease and incurring the costs. Indirect cost estimation was scarcely attempted. Literature revealed that some important cost items were omitted by both insurance and health economist which the patient alone could supply. No Nigerian based catastrophic DM expenditure study was sighted. Based on the gaps identified from previous studies the present study made attempt to determine the out-patient cost of DM and the associated catastrophic spending, payment strategies and payment coping mechanisms of people living with DM. It is pertinent to note that when studying costs of this nature, the perspectives of the people who are living out the experience becomes necessary to enable one capture the whole cost and present a clear picture of the situation in the general population. This study attempted to fill the missing gaps observed from literature.

CHAPTER THREE

RESEARCH METHOD

This chapter discussed the research method used for this study, area of study, target population, sample, sampling technique, inclusion criteria, and instrument for data collection, validity and reliability of instrument. It also discussed ethical consideration, procedure for data collection and method of data analysis.

Research Design

A cross sectional descriptive survey design was used for this study. This was deemed fit because ǒǒcost-of-illnessôô estimate represents a descriptive economic method which is often used to estimate cost of a particular disease (Songer & Ettaro, 1998). Cross sectional descriptive survey designwas therefore considered appropriate because the general purpose of descriptive survey is to observe, describe and document aspect of a situation as it naturally occurs and to show the need for change.

Area of Study

The area of study is the Federal Medical Centre (FMC), Umuahia also known as Queen Elizabeth Hospital, Umuahia. Federal Medical Centre (FMC) Umuahia is the oldest mission Hospital East of the Niger, built in the early 1950ôs.The hospital was taken over by the Federal Government of Nigeria in 1991 and renamed Federal Medical Centre, Umuahia. The hospital serves both self and health system referred patients from the seventeen local Government areas of Abia State as well as some parts of its neighbouring States- Imo, Ebonyi and Akwa Ibom. Located at 29 Aba Road, Umuahia, Abia State capital, FMC Umuahia is bounded on the South-East by Afara Village and Nigerian Prisons, Umuahia, on the East by Ibeku Central School and World Bank Housing Estate, on the North by Ndume Village and on the West by Umuahia/Ikot-Ekpene Road.

Being a tertiary health institution, it has facilities for training, research, clinical practice and specialty services. It runs both in-patients and out-patients services. The clinics are run from Monday to Friday weekly by different consultants.

Target Population.

The target population for this study were all the out patients receiving treatment for Diabetes Mellitus in Federal Medical Centre, Umuahia, Abia State. An average of 1,363 diabetics received care from the centre in the last one year, (diagnostic index 2009- 2011 of the Health Records Department of FMC Umuahia). 139 were admitted and managed as in-patients, while 1,224 were attended to as out-patients. The estimated 1,224 outpatients were, therefore used as target population.

Sample

A sample was selected as a representation of the total population because it may not be easy to reach and study every Type2 diabetic patient being managed at the centre within the study period. The sample size for this study was 308 type2 DM patients.

The sample size was obtained using this formular

$n= Z^2 \times p\ (1- p)/d^2$ where; $Z_{=}$ the confidence interval of the proportion = 1.96. P = the proportion or the best guess.

Due to lack of information on the proportion of type2 DM in economic burden studies, 50% or 0.5 was chosen as p.

d = the degree of tolerable error = 0.05 at 95% confidence level.

$n = 1.96^2 \times .5 \times .5 / 0.05^2 = 384.16$

For finite population correction for proportion for small population we have

$n = n_o/1+ (n_{o\,-\,1}) /N$ where n_o = original sample size; n = new sample size and N= population size

n = 384/ 1 + (384 - 1) /1224 = 384/ 1 + (383/1224) = 384/1.31 = 293.13

Adjusting for non response at 5% we have

q =n/ 1 ï f. where q is the adjustment factor and f is the estimated non response rate.

q = n/ 1- 0.5 = n/.95

293/.95=308.42

Thus 308 diabetic patients were used as the sample.

Inclusion Criteria

- The subject must have been diagnosed as type2 diabetic and receiving treatment in F.M.C Umuahia for the past one year as outpatient within the period of study (July, 2011- June, 2012)
- Patient must actively involved in the management of the condition.
- There should be willingness to participate
- Patient should be 31-65years of age (hosts West African peak prevalence period (31-50) and age of onset of increasing incidence of DM complications 65years).

Sampling Procedure

The choice of FMC, Umuahia, was determined purposively. Systematic sampling technique was used to select 308 participants who met the study criteria. The Clinicsô appointment registers were used to form a sampling frame. The sampling interval for sample recruitment was calculated as 1224/308 =3.97. Therefore every 4th person was consecutively recruited on each clinic day till 308 respondents that met the eligibility criteria were selected.

Instrument for data collection

A researcher administered questionnaire was used to source information from the participants. The questionnaire was divided into 4 sections (A-D): Section A, demographic data; has 5 items, 4 close and 1open ended questions, Section B dwelt on the economic

burden of diabetic patients (direct costs of accessing DM care and indirect cost of earnings lost as a result of time spent visiting healthcare system and being absent from work. Section C dealt with payment strategies that diabetics use to pay for healthcare (Private, Public and Donors funding), OOPS, Cash and carry with refund, exemption, NGOS é and their payment Coping mechanisms (skipping appointment to avoid costs, use own money (earmarked savings), community-based support, interruption of payment of childrenôs education and others. Section D assessed socio-economic status using asset base and derived catastrophic DM costs.

The instrument was made up of 28 items of both closed and open ended questions.

Items 1-5 dealt with demographic data; items 6-21 dwelt on direct and indirect costs of diabetes, made of 13 open ended and 2 close ended questions. Items 22 and 23 dealt with payment strategies and coping mechanisms and has 2 close ended questions. Items 24 to 28 assessed socioeconomic status, catastrophic DM costs and elicited descriptive narrative of respondentsô difficulty level and suggestion to aid coping with payment using 4 open ended and 1close ended questions.

Validity of the Instrument

Face validation of the instrument was done by the researcherôs project supervisor. Her inputs were used to make necessary modification before field testing.

The researcher-made questionnaire was given to two experts in the field of study, endocrinologist (Diabetes physician) and a specialist in Health economics to evaluate the relevance of the items. From the scrutiny, some items were discarded while others were modified. Their inputs were used to effect corrections and the instrument accepted as valid for data collection by Researcherôs Supervisor.

Reliability of the Instrument

The questionnaire was pilot tested on 30 patients attending a peripheral diabetic clinic (Hammer Smith Hospital Umuahia). Internal consistency reliability approach was employed to evaluate the instrumentôs reliability. Data obtained were used to calculate the internal consistency of the instrument using coefficient alpha (Cronbachôs alpha) method. The co-efficient of reliability obtained by sections were 0.40, 0.80, 0.75 and 0.68 (A-D) respectively. (Normal range of value is .00 and +1.00) (Polit, & Beck, 2008). The instrument was accepted as reliable for data collection.

Ethical Consideration

Ethical clearance was obtained from the ethical committee of Federal Medical Centre Umuahia. Informed consents of the patients were obtained and assurance given to them that all information received would be handled confidentially. Participants were informed that participation is voluntary.

Procedure for data collection

A letter of permission to collect data from the Department of Nursing Science, University of Nigeria Enugu Campus and the ethical approval letter were presented to Heads of Department and Units in-charge of the Clinics and their cooperation solicited. Three research assistants were trained on the purpose of the study and how to administer the instrument. The training was done through teaching and demonstration in a three day, 2 hourly sessions. The researcher and the assistants collected the data until the 308 respondents who met the inclusion criteria were recruited. The instrument was administered within the hours of 8am and 1pm while the patients awaited their fasting plasma glucose results and to see their physicians to avoid disruption of daily clinic activities and ensure good attention from patients. The data collection lasted for 2 months.

Method of Data Analysis

Section A: Demographic data

The data gathered were collated, tallied, grouped and analysed using descriptive statistics. Statistical Package for Social Sciences (SPSS) version 16 was used for the analysis and data presented in percentages, frequencies, means and standard deviation. Univariate descriptive analysis was employed since the primary purpose was to describe the status of each variable and not to relate them to one another (Polit & Hungler, 1999)

Section B: Economic Burden.

The direct cost and indirect costs were derived using descriptive statistics. The monetary value of man hour lost was calculated using the Human Capital Approach (descriptive economic method); 8hours a day (40hours) a week for government workers, 10hours a day (60hours) a week for the self- employed and housewives. The unemployed were fitted based on their substitute employment and earnings at present. Wage loss was calculated using income at market value to get the proportion of earnings lost due to DM based on earnings per hour (wage rate) for different employment status. The wage rate for housewives was estimated at Nigerian minimum wage of ₦18,000.

Section C

Payment strategies and payment coping mechanism were assessed using descriptive statistics. The relationship between socio- economic status and the payment strategies and payment coping mechanisms was determined using Chi Square at (0.05) level of significance.

Section D

Section C: The socio-economic status and the catastrophic diabetic expenditure were analysed with descriptive statistics. Socio-economic status was determined using principle component analysis (PCA) in STATA Software. The first component of the PCA was used to

derive weight to form an assets- based socio-economic index which was used to categorize the respondents into four socioeconomic quartiles (q1-q4) of poorest, poorer, poor and least poor. Measure of in-equality was the ratio of the mean of the poorest SES group over that of the least poor. Catastrophic DM cost was determined as a proportion of DM cost and non food expenditure. Catastrophe was checked at fixed threshold of 40%, 30% and 10% and variable threshold of 10% for the poorest and 30% for the least poor. The association between socio-economic status and Catastrophic DM costs was assessed using Chi square statistics. P value less than 0.05 was considered statistically significant.

CHAPTER FOUR

PRESENTATION OF RESULTS

This chapter discussed the presentation of data collected. Of the 308 questionnaires administered, 292 which were properly completed (a return rate of 94.8%) were analysed in line with the objectives and are presented in Tables.

Part A: The Demographic Characteristics of Respondents

Table1: Demographic characteristics of respondents. n= 292

Demographic characteristics		F	%
Age group (in years)	30-40	40	13.7
	41-50	56	19.2
	50-65	196	67.1
Mean age	54±9.24		
	Total	292	100
Gender	Male	136	46.4
	Female	156	53.4
	Total	292	100
Marital status	Married	231	79.1
	Single	16	5.5
	Divorced	1	0.3
	Widow	41	14.0
	Widower	3	1.0
	Total	292	100
Highest educational attainment	No formal education	28	9.6
	Primary education	76	26.0
	Junior secondary	5	1.7
	Senior secondary	63	21.6
	University/college/polytechnic	119	40.8
	Post graduate	1	.3
	Total	292	100
Employment status	Unemployed	10	3.4
	Govt. employed	73	25
	Private employed	16	5.5
	Self employed	92	31.5
	Retired	57	19.5
	Farming	33	11.3
	Housewife	11	3.8
	Total	292	100

From Table1, the mean age of respondents was 54.1±9.24 years, with (67.1%) within 50-65 years age group. A little above half (53.4%) of respondents were females with majority of the respondents (79.1%) being married. Less than half (40.8%) of the respondents had university/college/polytechnic education while 28 (9.6%) had no formal education. 0ne quarter of respondents 73 (25%) of the respondents were employed by the government, 16 (5.5%) were in private sector employment, 57 (19.5%) had retired, 92 (31.5%) were self-employed, 10 (3.4%) unemployed, 33 (11.3%) were farmers while 11 (3.8%) were housewives.

Table 2: Length of DM treatment and frequency of check up at FMC Umuahia

	n=292	
Length of treatment	F	%
1-5years	239	81.8
6-10years	43	14.7
11-15years	7	2.4
16-20years	2	0.7
>20years	1	0.3
frequency of check up		
Weekly	45	15.4
2 weekly	121	41.4
4 weekly	106	36.8
6 weekly	5	1.7
8 weekly	15	5.1
Total	**292**	**100**

The length of treatment for diabetes covered the period from one year to above twenty years. Majority 239 (81.5%) of the respondents have received treatment for five years. On the frequency of check up, majority of the respondents fell within the category of 2 weekly and 4 weekly check up (41.4% and 38.6%) respectively.

Objective1: To determine the direct costs borne by diabetic patients attending the out-patient Department of F M C Umuahia.

Questions 7, 8, 9, 11 and 13 were used to derive the direct costs.

Table3: Direct Cost of DM per Month reflecting Unit Costs n=292

Cost Units	$\bar{x}$	SD
Folder	19.69	4.75
Drugs	7701.59	6921,93
Lab. Tests/investigations	4932.04	5627.60
Consultation fees	257.05	499.22
Insurance premium/copayment	886.83	3351.17
Transport	998.61	3073.11
Diabetic diet	28524.40	16069 .77
Self monitoring of glucose	3128.36	5983.92
Insulin syringe/disposables	958.47	2574 60
Extra house helper	1884.25	4749.32
Physiotherapy	252.92	2872.13
Dressings	397.88	1924.54
Cost incurred elsewhere same period on DM.	3409.22	12798.65
Cost of DM related diseases	2893.80	5933.70
Total	52104.28	28906.75
As a proportion of total expenditure	9.49%	11.125%

Table3 shows the cost units on which direct cost was calculated. Cost of DM diet ranked highest ₭28524.3966 followed distantly by drug and investigations (Tests) ₭7701.5925 and ₭4235.9450 respectively. Monthly direct cost of DM in this study is 52104.28±28906.75. Annual mean direct costs of DM is ₭52104.28 x 12 =₭625,251.36 ± ₭289,414.08

Objective2: To assess the indirect costs incurred by diabetics in accessing care for the disease.

This was determined using questions 4, 7, 15, 16, 17, 19, 20 and21.

Table 4: Sources of income of respondents

Sources	**f**	**%**
Salary	53	18.2
Family Support	30	10.3
Pension	11	3.8
Farming/crafts/trading	46	15.8
Salary and family support	25	8.6
Salary/family support/craft/trading	9	3.1
Family support and pension	41	14.0
Family support/farming/craft/trading	59	20.2
Pension/farming/craft/trading	2	0.7
Salary/support/farming/trading	12	4.1
Support/pension/farming/trading	4	1.4

*sources are not mutually exclusive.

Table4 shows that majority 59(20.2%) earn income from family support, farming, craft and trading. 53 (18.2%) used salary alone. Pension was the only source for 11 (3.8%). Others used a combination of sources as shown in table5 above. Noted was that majority 180 (61.7%) used family support singly and/or in combination. The assumption here is that funds from family support and other social supports were considered as income for the patients.

Table5: Respondents earnings from income sources and their earnings per hour

	N	Minimum income	Maximum income	$\bar{x}$	SD
Monthly earnings	292	4000.00	612000.00	67303.16	75546.47
earning per hour	292	16.67	3825.00	348.14	437.45

From Table5, the mean monthly earnings from income sources were ₦67,303.13 ± 75546.47 while the mean earnings per hour stood at ₦ 348.14±437.45.The earnings per hour was derived by dividing product of question15 by man-hour of respondents based question4

(employment status). The earning per hour was calculated at 8hours a day (40hours a week) for civil/public servants and 60 hours a week (10hours a day) for self employed, traders/big business, privately employed, farmers, housewives and DM helpers.

Table 6: Number of days respondents were absent from work in a month because of DM (Mean SD)

X	F	fx	F(x^2)	X^2	%
4	126	504	2016	16	43.2
2	121	242	484	4	41.4
1	45	45	45	1	15.4
Total	292	791	2545	21	100
2.708±1.2159 days					

Table6 showed that majority 126 (43.2%) absented for 4days.121 (41.4%) were absent for 2days while 45(15.4) absented for a day. Mean number of days absent was 2.7±1.2days.

Table7: Employment status of person accompanying respondents to treatment venues

Employment status	**F**	**%**
No employment	15	5.1
Self employed	97	32.9
Government employment	51	17.5
Trader/business	29	9.9
Private sector employment	8	2.7
Farming	7	2.4
DM helper	85	29.5

Employment status of respondents was determined and presented in table7. Majority 97(32.9) were self employed, 51 (17.5) were civil servants, 85 (29.5%) were employed as helpers to the diabetics while 15(5.1) were unemployed.

Table8: Indirect cost of DM care.

n=292

Time (minutes) lost	Frequency	$\bar{x}$	SD
Time taken to get to FMC	291	51.99	40.34
Time taken to see doctor on each appointment	291	351.95	131.08
Number of days absent from work /month	292	2.7	1.2
Number of appointments per mont	292	1.85	1.05
Money (Naira) productivity lost			
Patientsô monthly earnings	282	67303.16	75546.47
Attendantsô monthly earnings	289	23803.89	52760.60
Patientsô monthly loss	282	110938.80	153956.40
Attendantsô monthly loss	289	28720.80	71733.80
Total monthly wage loss by patients and attendant	279	139659.60	161,123.60
Annual wage loss by patient	282	1331265.60	1847476.80
Annual wage loss by attendant	289	344649.60	860798.40
Annual wage loss by both	289	1675915.20	193348 20
As percentage of patientsô income	279	12.06	12.35
As proportion of total expenditure	292	25.22%	

From table8, the respondents spent a mean time of 51.99±40.34 minutes travelling to FMC Umuahia and 351.95 ±131.08 minutes to receive healthcare. The mean time absent from work related to DM was 2.7 ± 1.2 days per month and kept a mean appointment days of 1.85 ±1.05. The monetary value of time loss was computed using 40 man- hour for public servants and 60hours a week for self employed and housewife. Diabetics that were unaccompanied regularly lost a mean monthly wage of ₭110938.80 ±153956.40 while a regularly

accompanied diabetic loss was 139659.60 ±161,123.60. Total annual loss income/wage from DM in this study was ك16759115.20 ± 1933483.20. The indirect cost constituted 12.06 ±12.35% patients annual earnings and 25.22% of respondentsô total consumption expenditure.

Time lost due to DM care was translated into money by using the man- hour earnings based on employment status to get the earnings per hour of respondents. The patientôs daily wage loss was valued by multiplying the number of days absent from work (question 16) by daily man-hour based on employment status (question4) multiplied by earnings from income sources (question 15) while the attendantsô hourly loss (in time) was estimated by adding waiting time in facility and time travel to the facility divided by 60 and multiplied by number of appointments per month. Attendantsô daily wage loss was valued by multiplying the attendantsô hourly loss based on employment status (question 17) multiplied by monthly earnings (question 19).Total wage loss was calculated by adding patientsô and attendantsô wage loss. Wages loss as a proportion of earnings equals total wage loss divided by earnings (question 15) multiplied by 100%.

Objective 3: To assess the catastrophic costs to different socioeconomic status groups of diabetics.

Question27 and the values of direct and indirect costs of DM were used to determine catastrophic DM costs.

Table9: Respondents' monthly expenditure in Naira and mean catastrophic DM cost at 40% threshold

Respondentsô expenditure	$\bar{x}$	SD
Food purchased	31800	39629.409
Food produced	9924.14	15233.004
Clothing	28300	33883.837
Rent	24400	53672.182
Health care	15400	22679.171
Cooking fuel	5272.89	6766.306
Educational expenses	84800	133722.492
Durable goods	64000.90	22855.090
Community welfare	11800	22331.883
Transportation	12000	14878.679
Utilities	10026.22	12214.113
Non food expenditure	256000	731710
Total expenditure	553724.50	999078
Catastrophic DM expenditure		
Direct cost	20.35%	11.29 %
Indirect cost	54.55 %	88.16 %
Mean catastrophic cost	37.45%	49.73%

Table9 showed the mean respondentsô expenditure on non food per month was `ك256000±731710. This was set against DM costs and multiplied by 100 (DM cost as a proportion of non food expenditure). Catastrophic DM costs were: direct cost 20.35% ± 11.29, indirect cost 54.55% ±88.16 and the mean catastrophic DM cost is therefore 37.45% ± 49.73%.

Table 10: Categorization of respondents into socioeconomic status groups as indicated by household items owned by respondents on assets based index.

Table10 Household Socioeconomic status of respondents n= 292

Household item	Weight	Yes	No
Radio	.53	284 (97.3%)	8 (2.7%)
Television	.24	277 (94.9%)	15 (5.1%)
Air conditioner	.48	29 (10.0%)	262 (90.0%)
Bicycle	.003	19 (6.5%)	273 (93.5%)
Motorcycle	-.012	25 (8.6%)	267 (91.4%)
Car	.34	106 (36.3%)	186 (63.7%)
Refrigerator	.601	169 (57.9%)	123 (42.1%)
Power generating set	.29	182 (62.3%)	110 (37.7%)
Gas cooker	.07	75 (25.7%)	217 (74.3%)
Electric fan	-.033	254 (87.0%)	38 (13.0%)
Microwave oven	.18	39 (13.4%)	252 (86.6%)
Washing machine	.30	14 (4.8%)	276 (95.2%)
Personal computer	.57	32 (11.1%)	257 (88.9%)

Socioeconomic status	Quartiles	Frequency	Percentage
Least Poor	Q4	72	24.65
Poor	Q3	73	25
Poorer Poor	Q2	73	25
Poorest	Q1	74	25.34
Total		292	100

Table 10 showed the respondents were categorized into four socioeconomic status groups using principle component analysis (PCA) on STATA software to generate an assets based index. The first component of the PCA was used to assign weights which was used develop an assets based index using household assets owned by the respondents. The highest weight was assigned to refrigerator (.601) followed by personal computer (.57) and so on as in table 9 above. The socioeconomic status quartiles were named as poorest (q1), poorer (q2) poor (q3) and the least poor (q4).

Table 11:Respondents expenditure per month by socioeconomic status (SD) and catastrophic expenditure

Expenditure	Q1 The poorest n=74	Q2 The poorer Poor n=73	Q3 The poor n=73	Q4 The least poor n=72
Non food expenditure	24,616.70 (56,254.39)	43165.67 (135.394.54)	67,990.53 (202,860.70)	120,227.80 (337,200.37)
Ratio of non food (qn/q1)	1	1.75	2.76	4.88
Ratio qn/q4	0.20	0.36	0.57	1
Catastrophic Threshold				
Threshold of 40				
Not catastrophic	41(55.4)	53(72.6)	50(82.2)	62(86.1)
Catastrophic	33(44.6)	20(27.4)	13(17.8)	10(13.9)
Threshold of 30				
Not catastrophic	24(35.1)	49(67.1)	45(61.6)	46(63.9)
Catastrophic	48(64.9)	24(32.9)	28(38.4)	26(36.1)
Threshold of 10				
Not catastrophic	12(16.2)	17(22.2)	23(31.5)	25(43.7)
Catastrophic	62(83.8)	56(77.8)	50(68.5)	47(65.3)

From Table11, Catastrophic expenditure for different SES groups were as followed:

At 40% threshold, the costs were: 44.6%, 27.4%, 17.8% and 13.9%, poorest to the least poor. At 30%, the levels were 64.9%, 32.9%, 38.4% and 36.1% while at 10% threshold 83.8%, 77.8%, 68.5% and 65.3%, poorest to the least poor respectively.

Mean non food expenditure was ك256000± 731710 .The poorest (q1) spent ك24616.70 and the least poor group expended 120227.80±337200.37 on non food. The ratio of q1 / q4 was 1: 4.88. The non food expenditure of the least poor was 4.88 times that of the poorest group.

Majority that suffered catastrophic expenditure at 40% threshold belong to the poorest SES group 33(44.6%). Only 10 (13.9%) of the least poor SES group experienced financial catastrophe at this level At 30% threshold catastrophic spending was highest among the poorest still 48 (64.9%) followed by the poor 28(38.4). All SES group experienced catastrophic expenditure at 10% threshold but the poorest was worst affected 62 (83.8%) followed by the poorer poor 56 (77.8%). Using a variable threshold of 30% and 10% respectively for the least poor and poorest, the catastrophic levels were 36.1% and 83. 8%. Variable threshold gave a higher and disaggregated catastrophic expenditure reflecting the difference in their purchasing power.

Objective4: To identify the various payment strategies used by diabetic patients.

Table 12: Payment Strategies used by Respondents

Payment Strategies	Yes		No	
	F	%	f	%
Private Funding			5	1.7
OOP	287	98.3	271	92.8
Health Insurance	21	7.2	283	96.9
Prepayment	9	3.1	289	99.0
Deferred payment	3	1.0	8	2.7
Instalment	284	97.3	289	94.2
In-kind	3	5.8		
Government paid				
Cash and carry with reimbursement	2	0.7	290	99.3
Exemption from payment	2	0.7	290	99.3
Donors/social support				
Community based Insurance	17	5.8	275	94.2
NGOôs paid	2	0.7	290	99.3

Table12 shows that majority used private funding: Out of pocket spending (OOPS) 287 (98.3%), instalment payment 284 (97.3%) and Health insurance 21 (7.2%) followed distantly by social support (community based insurance) 17 (5.8%). Government and Non-governmental organisation (NGOS) paid for 2(.7%) respondents each.

Objective 5:Toidentify the Payment Coping Mechanisms used in treating DM

Table13: Payment Coping Mechanisms used by respondents.

Payment coping mechanisms	Often (Frequency/%)	Never (Frequency/%)
Own money earmarked saving/earnings	289 (99.0)	3 (1.0)
Disposal of Assets		
Sale of household mobile assets	16 (5.5)	94.5 (94.5)
Sale of lands	9 (3.1)	283 (96.9)
Borrowed money	54 (18.5)	283 (81.5)
Government Paid		
Social welfare waiver	2(0.7)	290 (99.3)
Payment on special visits	3(1.03)	289 (98.97)
social support		
Community based support	13 (4.5)	279 (95.5)
Family members paid	249 (85.3)	43 (14.7)
Gift from friends and neighbours	161 (55.1)	131 (44.9)
Diabetics Association	1 (0.3)	291 (99.7)
Cost savings/Evading behaviours		
Do not seek treatment	15 (5.1)	277 (94.9)
Stop children education	20 (6.8)	272 (93.2)
Skip appointments	41 (14.0)	251 (86.0)
Use alternative health remedies	24 (8.2)	268 (91.8)
Instalmental purchase of drug	287 (98.29)	5(1.71)
Skipped dose of drug when feeling well	118 (40.4)	174 (59.6)

From Table13, majority coped with payment using own money: earnings and earmarked savings 289 (99.0%) followed by cost saving/evading behaviours; instalment purchase of drugs 287 (98.3), skipped doses of drugs when feeling well to lengthen period of use 118 (40.4%), alternative therapies 24 (8.2) and 20 (6.8%) stopped education of their children. Some coped with social support: extended family members paid for 249 (85.5) and gifts from

friends and neighbours aided 161(55.1%), sold household assets 54 (18.5%) borrowed money 16 (5.5%) sold household assets while 9 (3.1%) sold land.

Hypotheses Testing

Hypothesis 1: There is no significant difference between socioeconomic status (SES) and catastrophic DM costs.

Table14: The difference between SES and catastrophic DM expenditure.

Catastrophic DM expenditure	**Socio Economic Status**				Df	Chi-square(P-value)
	The poorest n=74	**The poorer Poor n=73**	**The poor n=73**	**The least poor n=72**		
Threshold of 40						
Not catastrophic	41(55.43	53(72.6)	50(82.)	62(86.1)	3	7.590(0.050)
Catastrophic	3(44.6)	20(27.4)	13(17.)	10(13.9)		
Threshold of 30						
Not catastrophic	24(35.1)	49(67.1)	45(61.6)	46(63.9)	3	5.128(0.163)
Catastrophic	48(64.9)	24(32.9)	28(38.4)	26(36.1)		
Threshold of 10						
Not catastrophic					3	6.053(0.109)
Catastrophic						
	12(16.2)	17(22.2)	23(31.5)	25(43.7)		
	62(83.8)	56(77.8)	50(68.5)	47(65.3)		

Table14 shows that majority that suffered catastrophic expenditure at 40% threshold belong to the poorest SES group 33(44.6%). Only 10 (13.9%) of the least poor SES group experienced financial catastrophe at this level with overall catastrophe of 37.45%. At 30% threshold catastrophic spending was highest among the poorest still 48 (64.9%) followed by the poor 28(38.4). All SES group experienced catastrophic expenditure at 10% threshold but the poorest was worst affected 62 (83.8%) followed by the poorer poor 56 (77.8%). Using a variable threshold of 30% and 10% respectively for the least poor and poorest, the

catastrophic levels were 36.1% and 83. 8%. Variable threshold gives a higher and disaggregated catastrophic expenditure levels and is believed to be more appropriate measure (Onoka et al 2011).

At 40% threshold, there was no significant difference between catastrophic DM expenditure and socioeconomic status using Chi square statistics p- value 0.050 therefore the null was accepted. There was no statistical difference between the variables at 30% and 10% threshold, the null was accepted.

Hypothesis2: There is no significant difference between socioeconomic status and payment strategies used by respondents.

Table15: The difference between socio-economic status of the respondents and the payment strategies used. P (0.05)

Payment strategies	**Socio Economic Status**				DF	Chi-square(P-value)
	The poorest n=74	The poorer Poor N=73	The poor n=73	The least poor n=72		
Private fund						
OOP						
No					3	2.273(0.518)
Yes						
Health insurance	1(20)	0(0)	2(2.7)	2(2.8)		
No	73(98.6)	73(100)	71(97.3)	70(97.2)	3	9.342
Yes						*(0.025)
Deferred payment	71(95.9)	72(98.6)	64(87.7)	64 (88.9)		
No	3(4.1)	1(1.4)	9(12.3)	8(11.1)		
Yes					3	
Instalment payment	73(98.6)	72(98.6)	72(98.6)	72(100)		0.992(0.803)
No	1(1.4)	1(1.4)	1(1.4)	0		
Yes					3	
Prepayment	70(94.6)	72(98.6)	70(95.9)	72(100)		5.030(0.170)
No	4(5.4)	1(1.4)	3(4.1)	0(0)		
Yes					3	
In- kind	74(100)	73(100)	66(90.4)	70(97.2)		15.044
No	0(0)	0(0)	7(9.6)	2(2.8)		*(0.002)
Yes					3	
Government paid	73(98.6)	73(100)	72(98.6)	71(98.6)		
Cash and carry with reimbursement	1(1.4)	0(0)	1(1.4)	1(1.4)		1.011(0.799)
No						
Yes					3	
Exemption from payment	72(97.3)	73(100)	73(100)	72(100)		
No	2(2.7)	0(0)	0(0)	0(0)		5.933(0.115)
Yes					3	
Donors/social support	73(98.6)	73(100)	72(100)	72(100)		
Community based insurance	1(1.4)	0(0)	1(1.4)	0(0)		1.987(0.575)
No					3	
Yes	68(91.9)	57(98.88)	72(98.6)	72(100)		25.057[a]
	6(8.1)	16(21.91)	1(1.4)	0 (0)		*(0.003)
NGOs paid						
Yes					3	5.933(0.115)
No	72(97.3)	73(100)	73(100)	72(100)		
*Rejected	2(2.7)	0(0)	0(0)	0(0)		

Result of the analysis showed thatPrivate funding: OOPS, 97% and above of all socioeconomic status groups used OOPS as payment strategy. On Chi square statistics 2.293 (p-value 0.518) is greater than 0.05. The null hypothesis was accepted. Respondents in the higher SES used health insurance and prepayment (off front) payment more than lower group, Health insurance (9 poor, 8 least poor, 4 poorest and 1 poorer) x^2 (p ï value)was 9.342 (0.025). For prepayment (7 poor, 2 least poor 0 poorer 0 poorest) x^2 (p- value) was 15.044 (0.002), the null hypothesis was rejected. The table showed that use of Donor/ social support (community health insurance) differed with SES group of respondents. The lower SES used it more (16 poorer, 6 poorest, 1 poor 0 least poor) $x.^2$ (p ï value) 25.027 (0.003). The null was rejected.

Government paid (refund after payment) for two of the poorest. One each of poorest and the poor had government exemption. There was no statistical difference between SES of respondents and government payment. Chi square analytic result were 5.933(0.115) 1.987 (0.575) respectively. The null was accepted.

Hypothesis3: There is no significant difference between socioeconomic status and payment coping mechanism used by the respondents.

Table16: The difference between socioeconomic status of respondents and payment coping mechanisms.

Payment coping mechanism (Private)	Socio Economic Status				DF	Chi-square(P-value)
	The poorest n=74	The poorer Poor n=73	The poor n=73	The least poor n=72		
Own money						
savings ,earnings etc						
No	0(0)	0(0)	1(1.4)	2(2.8)	3	3.780(0.286)
Yes	74(100)	73(100)	72(98.6)	70(97.2)		
Disposal of assets						
Sale of household assets						
No						
Yes	68(91.)	69(94.5)	71(97.3)	68(94.4)	3	2.046(0.563)
Sale of lands	6(8.1)	4(5.5)	2(2.7)	4(5.6)		
No						
Yes	70(94.)	71(97.3)	71(97.3)	71(98.6)	3	2.085(0.555)
Borrowed money	4(5.4)	2(2.7)	2(2.7)	1(1.4)		
No						
Yes	54(73)	60(82.2)	63(79.5)	66(91.7)	3	8.733 *(0.033)
	20(27)	13(17.8)	5(20.5)	6(8.3)		
SOCIAL SUPPORT						
Community based support						
No	67(90.)	69(94.5)	73(100)	70(97.2)	3	8.419 *(0.038)
Yes	7(9.5)	4(5.5)	0(0)	2(2.8)		
Gift from friends						
No	27(36.)	33(45.2)	33(45.2)	38(52.8)	3	3.929(0.269)
Yes	47(63.)	40(54.8)	40(54.8)	34(47.2)		
Family member paid						
No	10(13.)	5(6.8)	14(19.2)	14(19.4)	3	6.122(0.106)
Yes	64(86.)	68(93.2)	59(80.8)	58(80.6)		
DM Association paid						
No	74(100)	73(100)	73(100)	71(98.6)	3	3.066(0.382)
Yes	0(0)	0(0)	0(0)	1(1.4)		
Government paid						
Social welfare waiver						
No	74(100)	73(100)	72(98.6)	71(98.6)	3	2.042(0.564)
yes	0(0)	0(0)	1(0.013)	1(1.4)		
paid on special visit	2(2.7)	0 (0)	1 (1.4)	0 (0)	3	2.0588(0.585)
Cost saving/ evading behaviours						
Stop children school						
No	61(82)	70(95.9)				
Yes	13(18)	3(4.1)	71(97.3)	70(97.2)	3	17.986 *(0.001)
Do not seek treatment			2(2.7)	2(2.8)		
No	65(87.)	72(98.6)				
Yes	9(12.2)	1(1.4)	70(95.9)	70(97.2)	3	10.601(0.14)
Skipped appointment			3(4.1)	2(2.8)		
No	56(75.)	3(86.3)				
Yes	18(24.)	10(13.7)	64(87.7)	68(94.4)	3	10.963 *(0.012)
Use alternatives therapies			9(12.3)	4(5.6)		
No	67(90.)	69(94.5)				
Yes	7(9.5)	4(5.5)	64(87.7)	68(94.4)	3	3.189(0.363)
			9(12.3)	4(5.6)		
skipped doses of drugs						
No	60(81.)	65(89.0)				
yes	14(18.)	8 (11)	69(94.5)	70(97.2)	3	8.419 *(0.038)
			4(5.5)	2(2.8)		
Instalment purchase of drugs						
No	4 (5.4)	1(1.4)	3 (4.1)	12 (16.7)	3	5.050 (0.170)
Yes	70(94.)	72(98.6	70 (95.9)	60(83.3)		

- Rejected

From Table16, above 97% of all socioeconomic status groups coped with their own money in form of earnings and savings. The x^2 (p-value) of 3.780(0.286) was higher than 0.05. The null hypothesis was accepted.

Although, more respondents from lower SES group traded out household mobile assets and lands the difference was not statistically significant at x^2 (p-value) of 2.046 (0.563) and 2.085(0.555). The lower SES borrowed more; poorest 20 (27.0) poorer 13 (17.8) poor 5 (6.8) least poor 6 (8.3). X^2 (p-value) 8.733 (0.033) is lower than 0.05. The null hypothesis was rejected. Of the social support mechanisms used by respondents only community based support was significantly related to socio economic status of respondents. The lower socio economic status group used it more; poorest 7 (9.5), poorer 4 (5.5), poor 0(0), and the least poor 2(2.8). At 3 degree of freedom the chi-square (p-value) was 8.419(0.038). The null hypothesis was rejected

Government social welfare waiver and special visit support were not significantly related to respondent socio economic status, however it was noted that the two that received government support belong to the higher socio economic group.

Stoppage of childrenôs education was used more by the lower socio economic group; poorest 13 (17.6%), poorer 3 (4.1%), poor 2 (2.7%) and least poor 2 (2.8%). Chi-square (p-value) of 17.986(0.001) is lower than 0.05, the null hypothesis was therefore rejected.

More respondents in the lower socio economic status group skipped appointment to save cost: poorest 18(24.3%), poorer 10 (13.7%) poor 9(12.3%) and the least poor 4(5.6%). The chi-square (p-value of 10.963(0.012) is significant so the null hypothesis was therefore rejected.

Respondents in the lower socio economic class also skipped doses of drugs when feeling well to lengthen the period of use and save cost; poorest 14(18.9%), poorer 8(11%), poor 4 (5.5%) and least poor 2(2.8%). Chi-square (p-value) of 8.419 (0.038) is considered significant therefore the null hypothesis was also rejected.

Table17: Respondents' report of Levels of ease/difficulty experienced in paying for diabetic management. n=292

Levels	F	%
Easy	56	19.1
Difficult	231	79.1
No response	5	1.7
Total	292	100

Table 16 shows that majority, 231 (79.1%) expressed difficulty paying for DM care, 56 (19.1%) found it easy while 5 (1.7%) had no response.

Question28 was posed to the respondents for suggestions on how to be assisted to cope with DM payment and the responses presented in table 18

Table 17: Respondentsô suggestions on ways to be assisted to cope with DM treatment

Suggestions	**f**	**%**
Provision of Free drugs	240	82.2
Free lab. tests	240	82.2
Support DM diet	240	82.2
Reduce waiting time in the lab.	115	39.4
NHIS	115	39.4
Diabetes Association	35	12.0
Train more specialist doctors	11	3.8
Find cure for DM	7	2.4
No response	4	1.4

*NB multiple responses.

Majority 240 (82.2%) suggested giving diabetics drugs and laboratory tests free and support diabetic diet. 115 (39.4%) opined reducing waiting time for investigations, 115 (39.4%) NHIS should involve all diabetics, 35 (12%) DM association should help while 7 (2.4%) and11 (3.8%) opined finding cure for DM and train more diabetes doctors respectively.

Summary of findings

The findings from this study were summarized as follows:

Direct cost was N52, 104. 28, Indirect cost, N139,569. 60 and Catastrophic DM costs: Overall monthly mean catastrophe was 37.45%. Catastrophic direct cost was 20.35% and indirect cost was 54.6% at 40% threshold. The mean monthly catastrophic type 2 DM costs for the SES quartiles (poorest q1, poorer q2, poor q3 and least poor q4) at 40% fixed threshold were 44.6%, 27.4%, 17.8% and 13.9% respectively. At variable threshold of 10% for q1 and 30% for q4, the catastrophic costs were 83.3% and 36.1% respectively. All SES quartile suffered catastrophic expenditure but the poorest quartile had the highest incidence.At 30% threshold, least poor had 36.1% and the poorest had 64.7% catastrophe while at 10% threshold, catastrophic expenditure were 65.3% and 83.8% least poor and poorest respectively.

Major payment strategies were OOPS 98.3%, instalment payment 97.3% and Health Insurance 7.2%. Major payment coping mechanisms were: own money 99.0%, instalment purchase of drugs 98.29% and social support (family and friends 85.3% and 55.1% respectively).P value less than 0.05 was considered statistically significant for test of hypotheses There was no statistical difference between SES of respondents and catastrophic cost.

SES was significantly associated with their use of health insurance p= (0.025), prepayment (off front) p= (0.002) and social support (community health insurance) p= (0.003) at 0.05 level of significance

Statistical difference were observed between lower and higher socioeconomic status in their use of the following: disposal of assets (borrowing) p= (0.033), Community based support p= (0.038) stop children education (p= (0.001), skipping appointment p= (0.012) and skipping dose of drug p= (0.038),

CHAPTER FIVE

Discussion of Findings

This chapter discussed the major findings from the study. It also covered the implications, recommendations, limitation of the study, conclusion and summary.

Objective 1: To determine the Direct Costs borne by Patients in treatment of DM.

The mean monthly direct cost of ₭52,104.28 in this study is considered rather high for respondentsô mean non food consumption expenditure of ₭ 256,000 and mean income from reported sources of ₭67,303.16±75,546.47;in relation to SES groupôs q1 and q4 ₭24,616.70 and ₭120,227.80This high cost may not be unrelated to the fact that most reported late with complications and co-morbidities that are known to increase cost burden of DM. Frequent visits to hospital related acute episodes and intensity of care also add to increased cost (IDF, 2005). Most respondents visited fortnightly. High cost of care is likely to impede effective DM care evidenced by irregular appointments and poor compliance to DM regimen due to inability to pay and the use of payment coping mechanism. The present cost of DM may also be attributed to change in price of DM supplies over time, high cost of DM supplies, global economic meltdown and the present inflation rate of the Naira. The only to explain how they paid this huge direct cost (more than double the consumption expenditure of q1 and almost 50% that of q4) is the use of payment coping mechanisms (social support, borrowingé). Unfortunately, funding healthcare with payment coping mechanisms inflate the total costs and push the patients deeper into poverty (ñHidden povertyò) (Oyakale and Yusuf, 2010).

The cost of diabetic diet ranked highest, followed by drugs (insulin and hypoglycaemic agents) and laboratory investigations. Diet coming top among cost units may be related to multitude of teachings on media on what to eat to reduce the incidence of DM by naturalistic,

traditional medicine and herbalists. Undue emphasis on the effects of supplements on DM care could make diabetics go for products like ñflavour charmò milk and special tea which are expensive, but may lack the essential nutrients for people with DM at their challenged period, or products that may be good, but more expensive than the locally available food sources. The belief on these wide claims made some respondents skip appointment, go for alternative therapy (bitter herbs) and even leave the DM medication totally only to come back when complications set in with attendant increased DM care. The demand for the selected food for the management of diabetes has gone high because more diabetics and others who wish to prevent DM are going for those foods which are believed to be appropriate for preventing DM.

The direct cost in this study was higher than that reported in other studies by Amoo and Ogunlesi, (2005) where the direct cost in their study was ك17,976 and Kiriga et al, (2009), ك34,397.20 ($2,144). However, the mean monthly direct cost is lower than ك180,581 reported by Ogbera (2006) on cost of treating diabetic ulcer. The direct cost as a proportion of respondentsô total consumption expenditure of 9.49% approximately 10%, was considered catastrophic by experts, Russell, (2004) and Ichoku and Fonta, (2009).

Diet ranking highest differed from previous studies where the cost of medication ranked highest followed by investigation (Amoo, et al, 2005, Ogbera, 2006, Khuwaja, et al, 2007, Onwujekwe et al, 2010). These previous studies were carried out among in-patients. In-patients require intensive care to control and stabilize the plasma blood sugar and period of hospitalization for diabetic foot ulcer management is longer. However, in an out-patient study by Needham et al., (2003) in Karachi, Pakistan, the annual mean cost of DM was US$197 (ك33,096) and medication accounted for the largest share of direct cost (46%) followed by laboratory tests. The value of currency then may be higher than the present value of Naira and social security policy in their country may also account for the difference. The high direct

cost in this study agreed with Ke et al, (2010), who noted that the capacity to pay is defined as the effective income remaining after the basic subsistence needs have been met.

Objective 2: To assess theIndirect costs incurred by diabetics in accessing care for the disease.

The indirect cost of ₭139,659.60± 161,123.60 which is 25.2% of respondentsô total consumption expenditure is considered quite high. The high indirect cost of DM observed in this study may be related to complications and the fact that the majority (80%) of respondents in the present study were employed, 32.9% being self-employed (most trading), followed by civil servants (government employees) with improved minimum wage, and retirees who are seemingly young and strong and having substitute employment haven retired by length of service. The respondents absented 2.7days a month from work, lost 403.94minutes (6.73hours) attending checkups and had a mean check up appointment of 2 per month. This implies that respondents especially the self employed lost much their monthly earnings seeking DM care. This could make the diabetics to cut down consumption of basic needs like food to meet up with payment for DM care or skip appointments or not even attend at all as long as they feel well but report back when complications set in. This will not only involve more cost but also compromise the quality of life of diabetics/families.

The finding from this study is in agreement with William, (2002), who noted that indirect cost is usually 2-3 times higher than the direct cost because it is tied to personal earnings. This finding is also corroborated by Zhang et al, (2010), who observed that the largest economic burden of diabetes mellitus is the monetary value associated with productivity losses. They noted that the losses are larger in poorer countries because of late diagnosis, complications and loss of life. They supported this by reporting that India and Tanzania incurred indirect cost of $236.6 billion and $2.5 billion respectively per annum. Solli et al., (2010), observed an indirect cost of diabetes of €293 million in Norway. However in a similar study in Western Nigeria, Amoo et al (2005) reported an indirect cost of DM per week of ₭406.00 (₭1,624 per month) which was observed to be lower than their direct cost, which is a contrast to the findings in this present study. This could be attributed to the unit costs

considered in that study, population 57, change in cost over time, inflation and global economic recession.

Objective 3: To assess costs Catastrophic to different DM socioeconomic status groups

The high catastrophic DM cost observed in this study may not be unrelated to their frequent visit to health facilities and incurring increasing cost, high cost of diabetic supplies and late reporting in this sub region with diabetic complications, out of pocket payment and high poverty level in the country. Moreso, the present study considered the indirect cost of DM (cost of productivity lost) as the productive age group (30-50) are mostly affected in Nigeria and other Sub Saharan African countries and this attracted catastrophic DM cost of 54.55%, supporting the observation of William, (2002) who noted that indirect cost is usually 2-3 times the direct cost and Zhang et al, (2004, 2010) who reported that the major economic burden in DM care is monetary value of productivity lost. The high indirect cost and its share of catastrophic spending curb off healthcare consumption because of limited fund for OOPs. Lack of access to continuing DM care results to poor DM control and consequent poor quality of life and death.

However using a common threshold could mask the degree of difference in financial catastrophe experienced by different socioeconomic status groups. For example if the least poor has ك5000 to spend and poorest has ك500 and each spent 40% (ك2000 and ك200 respectively), this implies that the least poor still has ك3000 to spend on other needs which they could adjust to by cutting back on their luxuries while the poorest is left with ك300 to spend on the same market. Catastrophic DM costs affected all socio economic groups but the poorest group was worst affected in this study thus the need for financial protection of Diabetics through policy decision making.

The overall mean monthly catastrophic DM expenditure was 37.45±49.73% with a total of 74.90± 99.45% and catastrophic direct and indirect cost of 20.35±11.29 and 54.55 ±88.16 respectively and among the socioeconomic status groups 44.6%, 27.4%, 17. 8% and 13.9% (q1- q4) respectively at

40% threshold was higher than in previous studies, Onoka et al, 2010 noted 23% and 8% catastrophe (poorest and least poor) respectively and 14.8% in their 2011 study of catastrophic expenditure in Nigeria. Onwujekwe et al, (2012) also noted 27% catastrophe at 40% threshold. Experts considered this high though the study was not on DM which attracts frequent costs.

However, the overall catastrophic DM cost in this study is lower than that in Mudur (2007) who noted 40% catastrophic personal expenditure in Asia, Ke & Xu, (2007) and WHO, (2005) who observed in their independent study of catastrophic healthcare financing that expenditure of 40% or more of non subsistence income was catastrophic. At 40% threshold in the present study, catastrophic cost was high among the socioeconomic status groups with the poorest incurring the highest catastrophic cost (44.6%) and least poor (13.9%).

Using variable threshold of 10% and 30% (poorest and least poor), catastrophic DM cost were 83.8% and 36.1% respectively which was much high than in previous studies set at similar threshold; Onoka et al, (2010) at a threshold of 10% and 20% (poorest and least poor) observed 40% and 28% catastrophe respectively and in their 2011 study noted 36.5% and 32% catastrophic costs (poorest and richest) at 6.8% and 30% threshold respectively. Setting their threshold 5% poorest and 30% least poor the catastrophic costs were 45% and12% respectively which is lower than the finding in this study at similar threshold. However, expert agreed that expenditure more than 10% household consumption expenditure is catastrophic, Russell, 2004; Willey and Son ltd 2008; Ichoku & Fonta, 2009; Onwujekwe et al 2009). Consumption expenditure was noted as a preferred measure of living standard because such expenditure is likely to be sensitive to access to cash (OôDonnell et al 2008).

Objective 4: To identify the Payment strategies used by diabetics in paying for their treatment.

The greater number of respondents 98.3% funded their care privately; they paid out-of-pocket (OOPS) and most (97.3) also paid instalmentally because of probable limited access to cash at the point of need. Governmentôs payment in form of exemption and refund after payment and NGOS support were very negligible. This increased private funding means that DM care places significant financial burden on the diabetics/ their families. Few used National health insurance, prepayment (off

front) and community health insurance but the number was limited. The need to protect the patients from the impact of OOPS cannot be over emphasized. As access to treatment is subject to availability of cash. This finding is similar to the finding of Onwujekwe et al, (2010), who noted in their study on determinants of out of pocket expenditure that the cost of healthcare was high for the average Nigerian who, most times, pay out-of-pocket. They noted household OOPS as a proportion of private healthcare expenditure be above 90% in Nigeria.

In various independent studies, out- of-pocket spending was identified as major payment strategies Onwujekwe et al., (2009, Ichoku et al., 2009 and Adams et al, 2008 and Onoka et al, 2010) identified out-of-pocket spending as the major payment strategies. In 2005, Onwujekwe and Uzochukwu observed that user-fee without reimbursement was the commonest payment strategy, followed by instalment payment. This present finding is in support with Doorslaer et al, (2007), who noted that 14 countries studied in Asia use OOPS and that patientsô own OOPS accounts for 80% of healthcare expenditure in Bangladesh. Adam et al., (2008) also identified OOPS to be major strategy in West African countries (40%). It ranged from less than 6% in Namibia to over 60% in Cotedôivoire. Njoku et al, (2005) noted that Nigeria and other Bamako-initiative countries use OOPS. These are similar to the findings from this study. However, Onwujekwe et al, (2010) observed that developed countries have moved from user-fee to social insurance and tax-based models.

National Health Insurance is another strategy identified (9.6%). This finding is in agreement with Adams et al, (2008), who reported that formal health insurance is rare in developing countries and many households lack access to formal credit and savings. However, they also noted that social health insurance exist in few African countries like Ghana, Kenya and United Republic of Tanzania in small-scale form as National Health Insurance in Nigeria is still low-key (3% of the population) according to (Ukong, 2009). National Health Insurance Scheme (NHIS) is meant to improve the healthcare of Nigerians at the cost the government and the citizens can afford. For the token paid regularly, the contributors and their dependents are guaranteed quality healthcare when ill at payment or co-payment of 10% of total sum. The non-availability of NHIS to the majority of the Nigerian population means that the burden of cost of DM rests fully on the patients and their families, and there is no

mechanism for protecting the poor from the risk of catastrophic expenditure. Onwujekwe et al., (2010) corroborated this when they noted that the problem with healthcare financing is not acute scarcity of resources, but absence of intermediation and insurance mechanisms to manage risks. Other private payment strategies identified in this study are deferred payment and in-kind payment which Nyango et al, (2010) also observed were used in their Northern Nigerian study. Instalment payment (2.7%), prepayment (off-front) payment (3.1%) were also reported by Onwujekwe et al.,(2005) who stated that user-fee with reimbursement was the commonest payment strategy followed by instalment payment. Similarly Onwujekwe et al, (2010) also identified payment in instalments, off-front payment and reimbursement as strategies for paying for healthcare as was observed in this study. This means that government should adopt financial strategies that rely less on individual payment at the point of delivery and allow greater degree of risk sharing and protection for the poor who were the majority (57.2%) of the respondents in this study.

The second major payment strategy used was social support. These were in the form of community-based insurance, 3.7%, and donors (.7%). This finding is similar to Berman et al., (2010), who noted that community prepayment scheme is used in many rural African communities and in China. It helps to make health services available and affordable to all contributors. Adams et al., (2008) endorsed this finding by recommending formal prepayment scheme and social protection network to mitigate long-term effects of illness on individualsô wellbeing and support poverty reduction. Community-based insurance is in use in Burkina Faso, Ghana and Senegal. The patients rely on social capital of communities. Okoronkwo, et al, (2004) also are in support of this payment strategy when they asserted that community-based insurance is practiced in Nigeria (ôIsusuô) and it is particularly important in meeting immediate healthcare needs of the contributors in the rural communities. Community-based insurance can be used for payment for healthcare or emergency transportation to health facility.

Only (.7%) of respondents used donors as social support. This supports the assertion by Idemyor, (2010), Sridhar, (2010) and Cumming, (2010) that DM is getting less attention, co-ordination and funding than it deserves and the four major donors have been reluctant to provide grants or loans to handle NCDS such as DM, having not seen their direct link with poverty or development.

Objectives 5: Payment Coping Mechanisms used by diabetics attending FMC Umuahia

Majority of the respondents (99%) coping with own money payment using earnings and earmarked savings. Instalment purchase of drugs means that compliance to DM regimen depends on access to cash. This could have accounted for respondents also using other risky coping mechanisms like skipping appointments, skipping doses of drugs when feeling well, use alternative healthcare believing it to be cheaper or abandoning treatment to save or evade costs which can lead to acute episodes of complications and poor diabetic control thus indirectly increasing cost. Borrowing and trading out assets may push respondents deeper into poverty especially if borrowed from money lenders as interest on the money will further increase the cost burden while disposal of assets may provide immediate cushion but the persons are denied the value and comfort of their use. Some stopped children education to attend to their health first as the available fund may not carry them concurrently. Stoppage of children education may compromise their future human capital and push the family deeper into poverty. Social support from extended families, gifts from friends and neighbours community based support formed a major cushion for the respondents. These supports which may be cash or kind boost the patientsô income to provide diabetic supplies. This implies that African extended family system and other social welfare groups like age grades if properly organised and strengthened could form dependable cushion when illness challenges. However, because these supports may not be consistently sustaining, the need for government to provide financial protection mechanism targeted at diabetics as economic burden is seen to be higher than those in reviewed literature. More so government (waiver and payment on special visit) and diabetic association impact in coping with DM care is negligible.

These findings were similar to those in previous studies by Onwujekwe et al, (2005; 2010) where own money (OOPS) as the major payment coping mechanism and instalment payment were identified. Ke et al., (2010; Adams et al., 2008; WHO, 2008; Tawaih, 2000; Kapur, 2006; and Donnel et al., 2007) noted that individuals could fall back on savings ear-marked for other needs to cope with healthcare payment. Personal savings could be a means of mitigating the effect of high cost of DM care. Incomes and savings were reported as popular payment coping mechanisms in Zambia, Cote divoire, Chad and an average of 40% of West African countries cope with healthcare payment through them (Adams et al., 2008; Nwankwo et al, 2010). Patientsô income was significant in their coping and income for the respondents could have been boosted by funds from social support a payment coping mechanisms they used significantly as it was treated as income .However, using money saved for other basic items like food as payment coping mechanisms could jeopardize the health of the patients and further push them into poverty as noted by Wiley and sons Limited, (2008) because total expenditure is inflated and necessary consumption is temporarily sacrificed to pay for healthcare.

In this study, 14.0% skipped appointment to save/evade cost, while 5.1% did not seek treatment because they felt well and 40.4% skipped doses of drugs to make them last longer. This is similar to

Russell, (2004) and Needham et al., (2003) who identified not seeking treatment or abandon treatment as cost prevention strategies. These are risky behaviours as such patients could go down with acute complications of DM which has high cost burden. 6.8% stopped their childrenôs education related to inability to pay school fees and healthcare costs concurrently. Withdrawing children from school is a risky payment coping mechanism because it reduces their human capital and pushes the household into deeper poverty. This is similar to the findings of Oyekale et al., (2010; Adams & Ke, 2008; and Chuma et al., 2007).

8.2% of respondents used alternative healthcare system believing it to be cheaper than the orthodox. This cost saving behaviour was identified also by (Oyekale & Yusuf, 2010; Adams & Ke, 2008). The commonest alternative used was bitter herb (*ìUtaziî*) and bitter leave juice (ñOnugboò), which many asserted to be able to bring down their blood sugar fast. Use of traditional herbal products is a

common practice in Nigeria and many also believe them to be cheaper and more efficacious than the contemporary orthodox treatment. Others used supplements like Thianshi and GNLD which are not cheap and not a substitute to hypoglycaemic agent. Emphasis on these could make the diabetic suffer acute diabetic episodes as they may abandon their prescription or skip them within periods they are taking these perceived cheaper alternatives.

Disposal of assets was used by respondents to cope with payment. 5.5% traded out mobile household assets 3.1% sold land, some sold labour and 18.5% borrowed money to cope with payment. This finding corroborate the findings from earlier studies such as Wiley and sons Limited, 2008; Donell et al., 2007; Chuma et al., 2007; Okoronkwo, 2005; Onwujekwe et al., 2010; Oyekale et al., 2010; Tawiah, 2000; and Adams et al., 2008. Funding healthcare with payment coping mechanism like borrowing, wealth holding or sale of assets is like postponing the evil day. Borrowing and sale of assets were more among lower income earners; those of highest income are less likely to borrow or sell assets. Adams et al., 2008 noted that 68% in Burkina Faso, 23% in Zambia, coped through borrowing and sale of assets among others. However, studies revealed that borrowing can be at high interest, assets may be lumpy and depleting them may sacrifice future income (sinking into inescapable debts (Adams 2008). Government policy that will make services to the diabetic free at the point of delivery will save them from this embarrassment and help them live quality life.

Social support: family members paid for (85.3%), 55.1% coped with gift from friends/neighbours, 4.5% received community-based support, only 0.3% was assisted by DM Association. These findings are similar to Kapur, 2006; Oyakale & Yusuf., 2010; and Nwankwo, et al., 2010 who noted that respondents coped with help of family and friends. The poor representation of DM Association in his study buttressed the fact that DM care has not received the deserved attention in Nigeria (Idemyor, 2010; Sirdhar, 2010, Cumming, 2010). Adebayo (2008) asserted that strong DM association is necessary for diabetics to cope with payment. They can raise funds and hypothecate it to support members or another as the need arises to support partial or full treatment.

Government-paid: 2% coped through government support. The question on receiving support from government to cope with payment seemed strange as most respondents who believed the government takes from people and do not give. That government of the nation spends more than 5% of its budget on healthcare escaped notice of the respondents.

This finding differed from Nwankwo et al, (2010) who noted that government paid for 17% of the respondents in their Imo State study. Somanathan et al., 2006 noted that in Tonga, the healthcare coverage is universal and incidence of financial catastrophe dues to the OOPS is low. Government provides universal access to health services with minimal user changes. The UK, Canada and the USA operate tax-based funding (Stanhope and Lancaster, 2004). They noted that in the USA, government is involved in healthcare financing for population groups through social security services using Medicaid and Medicare system.

This study reveals government supported through waiver and payment on special visit. As a nurse clinician it was noted that the process of pauperisation is too long and subjects the clients/patients to undue distress. It is pertinent for the Nigerian government to heed (WHO, 2001; 2008) advice of making services free at the point of delivery and to adopt other risk pooling approaches such as social insurance and community prepayment scheme. This opinion was supported by Mudur (2007) who attributed the relative lower incidence of catastrophe in Thailand, Srilanka and Indonesia to low or absence of user fees.

The differences between socioeconomic status and catastrophic DM costs.

The poorest socioeconomic status group were found to suffer the highest catastrophe than other socioeconomic groups at 40%, 30% and 10% threshold. At 40% the x^2 (p-value) was 7.590(0.050). Although the lower socioeconomic status group suffered more catastrophe at 30% and 10% ,it was not statistically significant x^2 (p-value) were 5.128 (0.163) and 6.053 (0.109) respectively at 0.05 level of significance.

The catastrophic expending being more among the lower SES group may not be unrelated to the fact that the bulk of the economic burden consists of lost earnings (indirect cost) and their income level. Because the lower SES group have low consumption expenditure or earning each time absent from

work or attend facilities and spend 6hrs+ they lose much revenue. The higher catastrophic spending among the lower SES group despite the type of payment coping mechanisms they used is a concern. They borrowed more, traded assets more, received support from the community without obligation to pay back, and more supported by extended families, friends and neighbours.These seem to have temporarily swell up their consumption expenditure and mask their poverty level (hidden poverty). This finding is supported by Wiley and Son Ltd (2008) who noted that financing health expenditure with payment coping mechanism lead to hidden poverty because total expenditure is inflated and necessary consumption is temporarily sacrificed to pay for healthcare.

On the other hand because the higher SES group earn more income the catastrophic expenditure on total cost (economic burden of diabetes) tilting toward the lower SES group may also have masked the degree of catastrophe the least poor (rich) suffered from huge lost earnings (indirect cost) . However using fixed (uniform) threshold to judge catastrophic expenditure among SES groups may not show the degree of difference. For example if least poor has ك5000 and the poorest ك500 and each spends 40% (ك2000 and ك200) respectively, the least poor will still have ك3000 to spend on other needs and could easily adjust by cutting back on their luxuries while the poorest will be left with ك300 to access other needs in the market. The finding from this study is also similar to that of Onwujekwe et al (2010) who observed that at 40% threshold, the highest proportion (23%) was among the poorest. However, 15% of the studied population experienced catastrophe at 4% non-food expenditure, which is much lower than 37.45% observed in this study. Similarly, Russell, (2004), reported that the mean annual cost for illness in Nigeria is 7% of household income above which individuals cut consumptions of their basic needs. From this study, it could be seen that catastrophic expenditure varies with socio-economic class and within same groups. Various levels exist for individuals. Cushion should therefore, be organized especially for the very poor to enable them to pay for their DM cost and still live qualitative life as high level (37.45%) mean catastrophic level observed in the present study could be distressing to individual diabetics. This was worsened by the payment mechanism used (OOPS), poverty level of the nation and absence of financial protection for the poor. WHO, (2005) noted that where OOPS is the predominant payment strategy, poverty

(inability to pay) exists and there is no financial risk protection measures in place that catastrophic expenditure could be high. This could also explain the high catastrophic spending reported in this study. Diabetics need assistance to cope with the economic burden of DM.

The difference between socioeconomic status and payment strategies used by respondents

There was no significant difference in the use of private funding (OOPs) between the lower and higher SES groups. This implies that the poorest are not protected from the impact of OOPs and access to care may be limited by inability to pay at the point of accessing care. However there was significant difference between lower and higher socioeconomic status and their use of health insurance x^2 (p-value) 9.342 (0.025), prepayment (off front) x^2 (p-value) 15.044 (0.002) and social support (community health insurance) x^2 (p-value) 25.057 (0.003). Level of significance is 0.05.

People in the higher SES group have more funds at their disposal or employed at tertiary institutions where national health insurance is operational now and could buy into NHIS or even take private healthcare insurance than the lower SES group. Secondly they could meet their basic needs and have more funds to pay for health services off front (prepayment) while the lower SES group who have the concept of risk pooling used community based insurance (ñisusuò) more; setting aside voluntarily small amount into common purse for use in future probably earmarked for mitigating ill-health costs. Their practice of community based insurance may be due to lack of access to formal prepayment mechanisms. This means that the whole burden of payment rests more on the poorest SES groups but they could be assisted if the scheme is strengthened and formalized. There is need for government to enhance effective implementation of NHIS/ social insurance to cover all citizens.

The difference between SES and use of Payment Coping Mechanism by respondents.

There was no significant difference in the use of own money and instalment purchase of drug between the lower and high SES groups. That there is no difference in use of own money and instalment purchase of drugs means that lower SES are not protected since they having limited income and low propensity to save. Statistical difference was observed between lower and higher socioeconomic status in their use of disposal of assets (borrowing) x^2 (p-value) 8.733 (0.033), Community based

support x^2 (p-value) 8.419 (0.038) and behavioural coping mechanisms (stop children education x^2 (p-value) 17.986 (0.001), skipping appointment x^2 (p-value) 10.963(0.012) and skipping dose of drug x^2 (p-value) 8.419 (0.038). Level of significance is 0.05.

The lower SES borrowed more, traded off both mobile assets and lands, stopped children education, skipped appointment and doses of drugs, extended family members paid more for them and they received more community support without obligation to pay back to cope with payment. This implies that diabetic patients that belong to the lower SES group have limited ability to pay for Diabetes care but assistance from these sources gave them temporary cushion as most respondents reported difficulty with healthcare payment. Stoppage of childrenôs education may affect human capital development and maintain vicious cycle of poverty. The least poor are less likely to borrow, trade out assets, stop children education, skip appointment or doses and even receive community support because the citizen may see them as having the well with all to care for themselves. They easily could cut back on their luxuries and maintain fairer diabetes care.

Lack of significance in government and NGOôs activities in diabetes care means that the whole burden of diabetes care rested on the respondents and there is no financial risk protection for the poor. No wonder more than 79% of them reported difficulty with payment for diabetes care.

Conclusion

Based on the findings, the following conclusions were made.

Economic burden of DM was high for diabetic patients whose major payment strategy was private funding (OOPs and instalment payment).

Diabetic patients suffered high catastrophic costs due to frequent visits to health facilities, productive hours lost, (OOPs) payment, Poverty and DM complications.

Diabetics lacked ability to pay at point of accessing care (poverty) thus used payment coping mechanisms as temporary cushion although such could inflate the cost, compromise future human capital and lead to hidden poverty.

Diabetics need financial protection especially for the poorest since there was no significant difference between SES groups and catastrophic cost (poorest worst affected) and no significant difference in their use of private funding to pay and own money to cope with payment.

Economic burden of diabetes care rested on the diabetics due to lack of significant difference in government and NGOôs activities in diabetes care among SES groups.

Policy decision making to assist the diabetics cope with care is needful

Implication of Findings

In this study the economic burden of DM was high for patients and family. The implication is that this will invariably lead to increasing poverty and poor rate of development as the productive age group are mostly affected within this region. Patient will develop more chronic complications of DM with attendant poor quality of life, increased morbidity, mortality and productivity losses.

DM patients in this study suffered catastrophic costs, paid OOPs, made instalment payment and also purchased drugs instalmentally. This implies that diabetics will only access care when money is available and if OOPs is abolished and pro-poor mechanism to pool risk are implemented the diabetic will receive care when necessary and live better and productively.

This study showed that social support was a major coping mechanism. This implies that establishing a formal social support system like social insurance and enhancing the coverage of National health insurance could reduce economic burden of the diabetics.

This study also revealed that diabetics financed their care through payment coping mechanisms which imply that diabetics could be pushed deeper into poverty as costs are inflated in long run.

The poorest SES groups were found to suffer highest catastrophe in this study. Lack of difference in the use of private funding to pay and use of own money and instalment purchase of drugs to cope with payment implies that the poorest who constituted the majority in this study are not protected from the impact of OOPs and access to care may be limited by inability to pay at the point of accessing care.

Recommendations

- Diabetic Educators and other health professionals should**r**educe DM cost by implementing effective DM self-management education to protect the patients from confusions arising from diversity of misinformation about DM, especially in the area of feeding
- Healthcare providers (Doctors, Nurses, Pharmacists, Dieticiansé) should ensure that DM education is a part of every visit to update patients on self management and protect them from

free lancing teachers of DM that end up psyching up the patients and exploiting them to pay for DM cure.

- IDF global guideline on DM type 2 which is cost sensitive especially in resource-limited environment should be adopted and effectively implemented because of its cost effectiveness.

- Waiting time (351 minutes) in the facility which was found to be outrageous and could be distressing to diabetics should be reduced through appropriate policies and programmes.

- Advocacy to the management to provide adequate resources and check other time wasters in the facility is needful to reduce indirect cost of DM

- Concerned health practitioners can advocate for DM patients through the voice of DM association to reach hospital management, government agencies and NGOs, so that cost of DM supplies can be subsidized or made free at point of delivery.

- Cost of drugs apart from diet was major cost unit, Nigerian diabetics Association should be made aware of this so that advocacy for diabetic patients could be raised through appropriate channels for DM support. The government, NGOs, donor agencies, public spirited individuals should get involved in DM care.

- Pro-poor policies that could cushion/protect diabetics from unfavourable economic burden of DM should be put in place by government and enforce its implementation by providing the needed political will. For example, services should be made free at the point of delivery (exemption policy), social health insurance should be implemented in the rural communities and National Health insurance should be given a boost to achieve a wider coverage.

- Encourage the formation of strong DM Association in Abia state so that diabetics could pool their resources together as a strong social support group and not only ask for government assistance but also to help themselves.

- Extended family relationship which is culturally domiciled in Africa should be encouraged especially now that there is reemphasis on family involvement in care.

- Research should be intensified to find cure for DM thus reduce cost.

Summary

This study set out to determine the economic burden, payment strategies and payment coping mechanisms among patients with Diabetes Mellitus attending out- patient department of FMC Umuahia in Abia state South East Nigeria. Five research objective and three hypotheses guided the study. Cross-sectional descriptive survey was used for the study (Cost of illness design). The population for the study were adults between the ages of thirty (30) and sixty-five (65) years with type 2 DM who have attended for at least one year and within the period of study, April to June 2012. The estimated sample size for the study was 308.

The instrument for data collection was researcher administered questionnaire data was collected over two month period using one month recall period. Data were organised and analyzed using descriptive and inferential statistics on a statistical software package for social sciences (SPSS version 16). Principle component analysis on STATA software was used to decompose respondents into socio economic status groups based on ownership of household assets. Direct cost was examined by aggregating the unit costs of services delivered using one month recall period while the indirect cost calculated lost earnings based on employment status and manhour loss per month and their consumption expenditure. Catastrophic DM expenditure was calculated as the percentage of average monthly DM treatment expenditure divided by the average non food expenditure using a threshold of 40%. At a variable threshold of 30% and 10% for the least poor and the poorest catastrophic expenditure was also checked.

Finding revealed that economic burden for diabetes was very high among patients with type 2 DM. Economic burden of type2 DM in this study was ك191,763.88 per month. The monthly mean direct cost of type 2 DM was ك52,104.28±₦28,906.75. Diet ranked highest in cost items followed by drugs and laboratory investigations. The mean monthly indirect cost was ك139,659.60±ك161,123.60. Indirect cost as a proportion of respondents total consumption expenditure was 25.2%. Catastrophic monthly economic burden of type2 DM were: direct cost 20.35%, indirect cost 54.55% and total cost 74.9%. The overall mean catastrophic DM cost was 37.45±19.33. At 40%, all respondents across the socio-economic class boundaries suffered catastrophic financial expenditure, but the poorest were worst affected (44.6%) while the least poor were 13.9%. At 30% threshold total catastrophe expenditure was 43.2% with 64.9% and 36.1% poorest and least poor respectively suffering financial catastrophe while at 10% threshold 83.3% and 65.3% of the poorest and the least respectively experienced catastrophe. Considering a variable threshold of 10% and 30% for the poorest and least poor respectively the catastrophic levels were 83.3% and 36.1% respectively.

The major payment strategies used by the respondents in this study was private funding (OOPS and instalment payment), followed distantly by social support (community-based insurance).

Majority of respondents coped with own money(saving and income). Almost all the respondents purchased their drugs in instalment because of resource limitation. This was followed by social support (family members, friends and neighbours paid, community support) and use of cost saving/evading behaviours; some could be costly in the long run.

There was no statistical difference between socioeconomic status of respondents and catastrophic DM cost (0.05 level of significance). The poorest socioeconomic status group

were found to suffer the highest catastrophe than other socioeconomic groups at 40%, 30% and 10% threshold. At 40% threshold (p=0.050).

There was no significant difference in the use of private funding (OOPs) between the lower and higher SES groups. However there was significant difference between lower and higher socioeconomic status and their use of health insurance(p=0.025), prepayment (off front)(p= 0.002) and social support (community health insurance) (p=0.003). Level of significance is 0.05

There was no significant difference in the use of own money and instalment purchase of drug between the lower and high SES groups but Statistical difference was observed between lower and higher socioeconomic status in their use of disposal of assets (borrowing) (p=0.033), Community based support (p=0.038) and behavioural coping mechanisms (stop children education (p=0.001), skipping appointment (p=0.012) and skipping dose of drug (p=0.038). Level of significance is 0.05.

It was concluded that economic burden of DM was high, diabetic suffered catastrophic DM costs and need to reduce DM cost exist. Recommendations were made based on findings.

Limitation of the study

The investigator encountered difficulty during the literature search. No Nigerian patient-based full cost of DM study was sighted. Most works were done outside the West African sub-region. Secondly, the DM cost studies were in-patients and disease specific (DM foot ulcer). Most were also estimated from general population.

No catastrophic DM study done in Nigeria was seen.

Cost estimation may risk double counting because of cost of co-morbidity (COI problem) and multiple access of care within the period of study. On the other hand, cost items may be missed because of forgetfulness.

Asset based information was observed to be sensitive to some respondents who felt they were being audited. Few opted out of the study being angry with the government whom they said received their vote but left them to suffer so much. Data on premature death and premature retirement were not available and as such were not captured in this study.

Self report of cost of DM given by participants through the questionnaire can give an underestimation or exaggeration of the problem.

The technicality of the analysis of this work made it not only time consuming but cash intensive and distressing.

This study has limited generalization because only one Institution was used.

SUGGESTIONS FOR FURTHER STUDIES

Further studies should be carried out on economic burden of type 2 DM in the six geo-political zones of the country, using patients- based approach but a more standardized method as cost-of- illness analysis at the present has no gold standard. This study could also be replicated for type 1 DM.

A research could also be done on cost of DM on community level since the ones documented are all hospital based.

It is also suggested that further studies to assess health providersô awareness of the impact of DM cost on treatment outcome and health providersô contribution to increased DM cost in the health facilities should be carried out. Compare the cost DM and other common health problem in Nigeria like malaria Hypertensioné .

References

Adam, L., & Ke, X. (2008). Coping with Out-of-Pocket Payment for Healthcare Payment: Empirical evidence from 15 West African Countries. http://www.who.int/healthinfor/survey/en/

Adamu, A. (2003). Prevention and Control of Diabetes. *Pharmanews*, *25* (9).

Adebayo,F.F. (2009). New trends in the Management of Diabetes. *Pharmanews*,*31*(11).

Akobundu, E., Ju, J., Blatt, L., & Mullins, C.D. (2006). Disease-Specific Cost-of-Illness Studies: A Review of Current Methods. *Pharmacoeconomics,* 24, 869-890.

Alwan, A. (2010). WHO/UN Tackles Non-Communicable Diseases. http://*www.who.int/../indexhtml.*

American Diabetes Association. (2003). Economic Costs of Diabetes in the USA in 2002. *Diabetes Care*,*26,* 917-932.

American Diabetes Association. (2008). Economics Costs Diabetes in USA in 2007. *Diabetes Care*,*31*, 596-615.

American Diabetes Association. (2010). Diabetes in Employer-Sponsored Health Insurance. *Diabetes Care*, *33* (10).www.mediterms.com/script/main/art.asp.

Amoo, G., & Ogunlesi, A.O. (2005). Financial Cost of Treating Nigerian In-patients With Schizophrenia and Diabetes. *African Journal of MedicineMedical Science,34(*1*),* 15-23.

Awe, A.T., &Sanusi, R.A. (2009). Assessment of Awareness level of NHIS Among Healthcare consumers, Oyo state, Nigeria. *The Social Sciences*,*4*, 43-148.

Azevedo, M. & Allai, S. (2008). Diabetes in Sub-Saharan Africa: Kenya, Mali, Zambia, Nigeria, Mozambique and South Africa. *marioazevodo/at/jams.edu*.www.ncbi.nlm.nih.gov/pm(2822152)

Barcelo, A., Aedo, C., Rajpathak, S., &Robbles, S. (2002). The Costs of Diabetes in Latin America and Carribeans. *Bulletin of the World Health Organisation*. Geneva, WHO.

Berman, P., Nelson, H., Greco, G., Levine, R. Collins, D., & Conetto, G.(2010). Financial Barriers to Access. www.countdown2015mnch.org.

Bilikis, B. (2012). Reducingprevalence of Diabetes mellitus.www.bussinessdayonline.com/NG/index.php/analysis/commentary/47930-reducing-prevalence-of-diabetes-m

Bongani, Mayosi & Grote (2011). WHO, Experts and National Governments welcomes UN Resolution. UN General Assembly. September 2011. New York.

Chang,Y.P., & Javitt, J .C. (2000). Economic impact of Diabetes in Washington D. C. Georgetown University, Healthcare Financing Administration. Department of health and Human services. http://diabetesniddknih.gov./dm/pubs/Amer.

Centre for Disease Control. (2005). National Diabetes Fact Sheet. *National estimate on diabetes*. Atlanta.

Chukwu, O. (2011). Millenium Development Goals. *United Nations General Assembly*. New York.

Chuma, J., &Molyneux, C. (2007). Treatment-Seeking Behaviour, Cost Burden and Coping Strategies among Rural and Urban Households in Costal Kenya- An equity Analysis. *Tropical Medicine and International Health,12*, 673-686.

Cummings, R. (2010). Countries Endorse Resolution On Communicable.*www.who.int.../index.html*.

Dafogiannil, C., Kafourou, A., & Baltzi, E.(2004). Cost of Out-patient Care in Diabetes. *Icus Nursing Web Journal, 19,* 1-5.

Dawson, K. G., Gomes, D., Gerstein, H., Blanchard, J.F., & Kahler, K.H. (1999).The Economic Cost of Diabetes in Canada. *National Health Expenditure Trends 1975-1999*.

Department for International Development. (2010). Catastrophic Health Expenditure. *www.crehs.|shtm.ac.uk*

Donald, T., & Hawkin, D.J. (1980). MarketingResearchMeasurement and Methods: *A Text with Cases*(3rd ed.). Macmillian Publication.

Donnel, O. O., Doorslaer, E. V., Huq, K., &Eliva, R. R. (2007). Catastrophic Expenditure on Healthcare:*Comparative Evidence from Asia*. Health Economics, *16*(11). Department of health policy and Management Erasmus University Netherlands

Doorslaer, E.V., Donnel, O. O., Eliva, R. R., & Somanathan (2007) Analysis of personal catastrophic payment for healthcare in Asia.www.whoint/health=financing/pb-2.pdf

Eniyansoro, B. (2007). Diabetes: Controlling the Dangers of Excess Sugar. *Pharmanews,29*, (7) 11-18.

Federal of Health. (2003). The 2003 Nigerian Demographic Health survey. Federal Ministry of Health, Abuja. Nigeria.

Federal Ministry of Health. (2006). Evaluation of health expenditures: A paper presented at the health Budget preparation, expenditure and revenue monitoring Roundtable, 19 - 21st April 2006.

Gibala, D. (2009). Diabetes Awareness from contemplation to action: The power to control Diabetes is in your hand.www./iondubbutterPa.org/gpage//.html.

Hogan, P.,& Dall, T. (2003). Economic Cost of Diabetes in the USA in 2002.*Diabetes Care,26*(3), 917-32.http://www.medwelljournals.com. http://www.prb.org/pdf08IUPDS.

Ichoku, A.E.,& Fonta, W. M. (2009). Catastrophic Healthcare Financing and Poverty-Empirical Evidence from Nigeria. *Journal of Social and Economic Development*, (1sted.). www.thefreelibrary.com/catastrophic...

Idemyor,V. (2010). Diabetes in Sub-Saharan Africa: healthcare perspectives, challenges and the economic burden of disease. *Journal of National Medical Association, 102,* 650-653.

International Diabetes Federation (IDF). (2005) Global Guideline for Management of Type2 Diabetes. *www.idf.org.communications@idf.org*

IDF Clinical guidelines Task Force. (2005). Global Guidelines for Diabetes. *Brussels International Diabetes Federation*.

.International Diabetes Federation (IDF). (2012). Prevalence of Diabetes in African Region. *www.idf.org.communications@idf.org*.

Idris , J. (2009). Taming Hypertension and Diabetes in Nigeria. *Pharmanews*; *31*(9).

Ikhiesmoje, T. (2006). Prevention and control of diabetes.*Pharmanews*,28 (11) 11-14

Kaleml, O. (2006) WHO Guide to identifying the economic consequences of diseases: Analysis of African countries 1985-2000. www.who.int/choice/publications/d_e...july.2011

Kapur, A. (2006) Economic Analysis of Diabetes Care. *India Journal of Medical Research*; 125, 473.

Ke, X. (2007). Catastrophic Healthcare expenditure, WHO, Geneva. http://www.who.int/healthinto/survey/en/

Ke, X., Evans, D., & Carrin, G. (2007). Designing health financing policy towards universal coverage. *Bull World Health Organ*. 2007, 85, 652.

Ke, X, Evans, K. K., & David, B. (2010). Elimination of usersôfee in Uganda: Impact on utilization and catastrophic health expenditure. www.who.int/healthfinancingdocument.

Ke, X., David, B., Evans, K.K., Riadh, Z., Klavus, J., & Murray, J.C. (2010). Household catastrophic health expenditure: a multicountry analysis. www.who.int/health-financing/lancet...

Kiriga, J.M.,& Barry, S.P. (2008). Health challenges in Africa and the way forward. *International Archives of Medicine1*, 27.

Kiriga,J.M., Sambo,H.B., Sambo,L.G., & Barry, S.P. (2009). Economic burden of Diabetes in the West African region. *Biomed central9*, 6.

Kozier, R., Berman, A., Snyder, S.J., & Erb, G. (2008).*Kozier and Erb's Fundamentals of Nursing: Concepts, Process and Practice* (8th ed.). Pearson Education Inc.

Kraut, A., Walld, R., Tate, R., & Cam, M. (2001). Impact of diabetes on employment and income in Manatoba. *Diabetes Care,24*, 64-8.

Liaquat, K., Khuwaja, A., & Cosgrove, P. (2007). Cost of Diabetes Care in Outpatient Clinic of Karachi, Pakistan. *Biomed Central, 7*, 189.

Mbaya, J. C. (2003). Diabetes Costs: Sub-Saharan African Perspective. *International Textbook of Diabetes mellitus*. Yaounde: University of Yaounde.

Magasi, A. (2011). Nigeria: United Nations and Non-communicable Diseases. www.allafrica.com/com.

Mold, J.W., Fryer, G.E., and Thomas, C.H. (2004). who are the uninsured elderly in the United States? *Journal of American Geriatric Society*; 52, 601-606.

Mudur, G. (2007) Catastrophic Personal payment in Asia. BJM 334: 447 bjm39139.656698.DB. www.pubmedentra/.nih.gov.

Murray, C. and Lopaz, A. D. (2001). Global Health Statistics: A Compendium of Incidence, Prevalence and Mortality Estimates for Over 200 conditions. *Geneva*.

National Academy of Science, Rice, D. P, Kalman, Millerf and Dummeger (2010). Accounting for Health and Healthcare: Approaches to Measuring The Sources and Costs of Their Improvement. http://www.nap.edu.

National Bureau of Statistics, (2007) National Population Commission, National Manpower Board.The Nigerian Statistical Fact Sheet in Economic and Social Development.

Ngango, D.D., Mutilir, J.T., Labes, E.P., kigbu., J.H. and Buba., M. (2010). Skill Attendance: The Key Challenges to Progress in Achieving MDGS in North Central Nigeria. *African Journal of Reproductive Health*; 14, 130.

Njoku, J., Ohagwu, C.C., and Okaro, A. O. (2010). Awareness and Perception of National Health Insurance Scheme (NHIS) Among Radiographers in South-East Nigeria.*American Journal of Scientific Research*; 4 (2).

Nwachukwu, N. (2010). Nigeria Resolution on Non-communicable Disease: the latest in a long list of neglected tropical diseases. http://www.nigeriastalk.org.

Nwankwo, C.H. Nandy, B and Nwankwo, B.O (2010). Factors Influencing Diabetes Management Outcome among Patients Attending Government Health Facilities In South-East, Nigeria. *International journal of Tropical Medicine*; 5:28-36.

Obayendo, T (2008) Critical Steps in Diabetes Management. *Pharmanews*; 30 (4) 11- 24.

OõDonnell O, Flores G, Krishnakumar J, and van Doorslaer E (2008) Coping with health-care costs: implications for the measurement of catastrophic expenditures and poverty. Health Economics17, 1393ï 1412

Ogbera, A.O.,Fasanmade., O.,Ohwovoriole, A.E., and Adediran, O. (2007). An Assessment of the Disease Burden of Foot Ulcer in Patients with Diabetes Mellitus attending a Teaching Hospital in Lagos, Nigeria. *International Journal of Lower Extremity Wounds, 5,*244-249.

Odeleye, (2008). Diabetes incidence on the rise. *Pharmanews 30* (6) 22-24

Okoronkwo, (2004) Health Economics: Basic Issues and Processes Nigerian Institute for Development Studies, University of Nigeria Enugu Campus.

Olakunde, B.O (2012) Public Health Financing in Nigeria which way forward? *Annals of Nigerian Medicine. 6* (1) January ï June 2012. Retrieved from http://www.annjournal.com

Onoka, C. A., Onwujekwe, O. E., Hanson, K., and Uzochukwu,B. (2010) Measuring Catastrophic Healthcare Expenditure in Nigeria: Implication for Financial Risk Protection. www.crenhs.ishtm.ac.uk/downloads/pub.

Onoka,C.A, Onwujekwe, O. E, Hanson, K., & Uzochukwu, B. S (2011) Examining catastrophic health expenditure in Nigeria. *Tropical Medicine and International health, 6(*10) 1334-1441.

Onwughalu, C, Ike, E, Onwujekwe, O. E, Hanson, K, Uzochukwu, B. S., & Ichoku, H. (2009) Are Malaria Treatment expenditure catastrophic to different socioeconomic groups and geographic groups and how do they cope with payment in Southeast Nigeria? *Tropical medicine and International Health, 15* (1) 18-25.

Onwujekwe, O.E., & Uzochukwu, B. (2005). Socio-economic Differentials in Costs and Payment Strategies for Primary Healthcare Services in South-East, Nigeria. *Health policy*,2005, 383-397.

Onwujekwe, O.E., Uzochukwu, B.S.C., Obikeze, E.N., Okoronkwo, I., Ochonma, O.G, Onoka,C.A., Madubuko,G., & Okoli, C.(2010). Investigating Determinants of Out-of-Pocket Spending and Strategies for Coping with Payments for Healthcare in South- East Nigeria. *Biomed Central, Health Services Research,*10 (67).

Onwujekwe, o, Ichoku, H., & Fonta, W. (2009). Incidence and intensity of catastrophic healthcare financing and impoverishment due to out-of-pocket payment in Southeast Nigeria. *Journal of insurance and risk management, 4* (4) 47-59.

Onwujekwe, O.E., Uzochukwu, B.S.C., Obikeze, E.N., Onoka, C.A., Eze, S., & Okoli, C (2009) Is community-based health insurance an equitable strategy for paying for healthcare? Experiences from southeast Nigeria. *Health policy 92*(1) 96-102. Doi10.1016/ihealthpol.2009.02.007.Epub. www.nlm.nih.gov/accessibility.htm/

Onwujekwe, O. E., Onoka, C. A., Hanson, K., and Uzochukwu, B. (2011) Examining Catastrophic health expenditure at variable thresholds using household consumption expenditure dairies.*Tropical Medicine and International Health, 16* (10) 1334-1341

Onwujekwe, O. E, Hanson, K and Uzochukwu, B. S (2012) Examining inequities in incidence of catastrophic experience of different health services and health facilities in Nigeria. PLoS ONE 7 (7):doi10.1371/journal.pome.0040811. www.plosone.org.

Osotimehin, B. (2009). Future Health: Alarm on Non-communicable Diseases. *5th Biennial Conference of Clinical Chemist of Nigeria, Ibadan*.

Osuala, E.O. (2005). Research and Statistics In Nursing and Related Fields: A Practical Approach. *Rex charles and Patrick ltd*.

Oyakale, T.O. and Yusuf, S.A. (2010). Multi-dimensional Poverty of Shock-exposed Households and Coping Mechanism in Rural Nigeria. *The Social Science*; **5**:254-263.

Peele, P. B., Lave,J.R., and Songer, T.J. (2002). Diabetes In Employerï sponsored Health Insurance.*Diabetes Care*; **25**:11.

Peteva,R.J. (2001). A Cross-section of Nursing Research.*Journal Articles for Discussion and Evaluation*.Pyrczak.

Polit, D. F, Beck,C .T., and Hungler, B.P. (2001).Nursing Research, Principles and Methods. (6th ed.). Lippincott.

Polit, D.F. and Beck, C .T. (2008).Nursing Research, Generating and Assessing Evidence for Nursing Practice. (8th ed.). Wolters Kluwer/ Lippincott Williams and Wilkins.

Potter, P.A. and Perry, A.G. (2005).Fundamentals of Nursing.6th Ed, St. Louis Missouri. Mosby.

Prabhakaran, D. (2011). WHO/UN Inter-ministerial Meeting on Non-communicable Disease. Geneva.

Ransome, K. (2002). Reduction of Catastrophic Healthcare Spending by a Community Based Insurance Scheme in Gujurat: Current Experiences and Challenges. *Bull World Health Organ*.**80**:613 ï 621.

Rice, D.P. (2000) Estimating the Cost of Illness. *Government Printing Press*.

Rice, D.P, Hodgson, T.A and Kopotein, A.N. (1995). The Economic Cost of Illness: A Replication and Update .*Health Care Finance Review*.**7**:61-80.

Rubin, R. J., Altman, W.M., and Mendelson, D. N. (1994) Health Care Expenditure for People with Diabetes Mellitus. Journal of Clinical Endocrinology, Metabolism. **78**:809^{A}-809^{F}.

Russel, S. (2004) Economic Burden of Illness for Household in Developing Countries Focussing on Malaria, TB and HIV/AIDS. American Journal of Tropical Hygiene. **71**(suppl2):147-155.

Silink, M (2005) The impact of diabetes on healthcare and hospitalization. London. Pro-Book Publishing Limited, International Hospital Federation.

Smeltzer, S. C, Bare, B.G, Hinkle, J. C and Cheever, H. K (2008) Brunner and Studdarthsô Textbook of Medical Surgical Nursing 11th Edition. Lippincott, William and Wilkins.

Sridhar, D (2011) Non communicable diseases are development concern; United Nations General Assembly Special Session January 2011. New York.

Solli,O, Jenssen, T and Kristiansen, I. S (2010) Diabetes cost of illness in Norway. Biomed Central Endocrine Disorder. Retrieved from http://creativscommons.org/licensesiby/2.0 December 2010.

Somanathan, A Hafez, R and Fakahau, T (2009) Financing options for the health sector in Tonga. Diabetes Atlas, International Diabetes Federation and WHO database.

Songer,T.J Ettaro,B.S and the economic s of diabetes project panel (1998 reviewed 2000) The cost of diabetes. Centre for disease control and prevention, national centre for chronic disease prevention and health promotion, division of diabetes translation Atlanta.

Stanhope, M and Lancaster, J (2004)Community and Public Health Nursing. 6th Edition. Philadelphia. Mosby.

Soyibo, A (2004) National Health Account of Nigeria 1998-2002. Ibadan:University of Ibadan.

Soyibo, A, Olaniyan,O and Akanni, O.L (2009) National Health Account of Nigeria: 2003-2005, incorporating sub national health accounts of states: Report submitted to the Federal Ministry of Health Abuja.

Soyibo, A, Olaniyan,O and Akanni, O.L (2010) National Health Account of Nigeria. The structure of generational public transfer flow in Nigeria: Report submitted to the Federal Ministry of Health Abuja. March 2010.

Tawiah, P.K (2000) Basic Economics for West Africa 4th Ed. Nigeria. Idodoumeh publishers Ltd

Ubong, Ukpong (2009) Poor Coverage of NHIS Worries Senate. Daily Sun Newspaper. March 7th 2009.

UN (2010). prevention and control of non communicable diseases.http://www.who.int/mediacentre/newsinvites/2010/noncomunicabledisease 2010en/index.html. (New York).

United Nations General Assembly (2011) Report on Resolution on Non communicable diseases: A/RES165/238, 19TH -20TH Sept. New York.

USA Department of Health and Human Services (2005) Surgeons Generalôs call to action to improve the health and wellness of people with disabilities. Rockville, MD Public Health Services, office of Surgeon General.

Uzoagulu, A. E. (2011). Practical guide to writing research project reportin Tertiary institutions. Enugu: John JacobsôClassic Publications Ltd.

Van, D.S., Beulens, J.W., Schouw, Y.T., Grobbee D.E.,& Neal, B. (2010). The global burden of diabetes and its complications: an emerging pandemic. Euro.Journal of Cardiovascular Prevention and Rehabilitation. May; 17 suppl. 1:5 3-8.

WHO (2002). Obesity Preventing and Managing the global Epidemic. Report of WHO consultation. Geneva.

WHO (2005). Designing Health Financing Systems to reduce catastrophic health expenditure. Technical Briefs for Policy Makers Number 2. (WHO/EIP/HSF/PB/05.02). World Health Organisation, Department of Health System Financing; Health Financing Policy.

WHO (2008). Peer Support Programs in diabetes: A report of WHO consultation,5-7 Nov. 2007.

WHO (2008). WHO Diabetes Program. Geneva, WHO. http://www.who.int/diabetes/facts/worldfigures/en/index2.html]

WHO (2009). World Health Organization; African Region, Nigeria: Emerging epidemics.http://www.whoint/countries/nga/areas/hiv/en/index.html

WHO (2008). Coping with out of pocket health payment. http://www.who.int/healthinto/survey/en/.

Wielgosz, A.T. (2011). Chronic disease, injury, cancer 2011, June 31(3); 95.6

Wiley, J & Sons ltd (2008). Catastrophic Healthcare Payment. onlinelibrary .wiley.com/../pf, www.ncbi.nlm.nih.gov. Health economics (2008) 10/17. Issue 12 pp1393-1412

Willen,S.J & Wilkie,D.J. (2006). Patient expert assessor: Nursing management of pain.http://www.mosby.com/merlin/medsurg.lewis.

William, L.S.,& Hoper, P.D. (2004). Understanding Medical Surgical Nursing. Philadelphia, F.A,: Davis Company.

William,R. (2002). Diabetes: Its indirect costs; the cost of lost production. *Diabetes Voice, 47* (3), 41-45.

William. R. (1998). Diabetes : A mode for health care management. London: Saunders company.

Witter, S (2005). An unnecessary Evil? : User fee for healthcare in low income countries. London. Save the children.

World Health Assembly (2002). Resolution on Diet, Physical activities and Health. (Document:A55) 16 and A55(16 con l). WHO, vision 2020. Geneva, WHO.

World Health Assembly (2008). Strategies for the prevention and control of NCDS and its related action plan.

Zeck, W.,& McIntyre, H. (2008). Diabetes in rural East Africa : A call to action. *Journal of women health.* 17, 403 -411.

Zhang, P; Zhang, X., Betz, J.B., Vistisen, D., Sicree, R.A.,Shaw, J.,& Nichols, G.A. (2010). Economic Impact of diabetes.www.idf.org/sites/default/files/eco...aug 2011

Zhang, p., Engelgau, M.M.,& Norris, S.L. (2004). Application of Economic analysis to diabetes and diabetes care. *Annals of internal Medicine, 140* (11), 972-977.

Department of Nursing Sciences
Faculty of Health Science and Technology
University of Nigeria
Enugu Campus
30th May, 2011.

Dear Respondents,

RESPONSE TO QUESTIONNAIRE

I am a post graduate student of the above school currently undertaking a research project on ñEconomic costs and payment coping mechanisms of diabetic patientsò.

The questionnaire is strictly for collection of data for academic purposes. Please supply the information as frankly as possible to make this study a success. Data from this study will enable estimation of the economic burden of diabetes, decision making related to costs of diabetes management and raise advocacy position for policy makers and government to assist diabetic patients cope with the costs of diabetes care.

Be assured that all the information given by you will be held in confidence. Your names and personal identifiers are not required.

Thanks for your acceptance and co-operation.

Yours sincerely Ekpemiro J.N

QUESTIONNAIRE

Please answer the following questions as sincerely as possible the way it applies to you.

SECTION A: DEMOGRAPHIC CHARACTERISTICS

Please write either (1 or 0) in the most appropriate space for the most correct impression about you or provide answers to the blank spaces.

1. Gender of respondents male [ ] female [ ] (male= 1, female= 0)

2. What was your age as at last birthdayé é é é .

3. Marital Status (a) married [ ] (b) Single [ ]

(c) Divorced [ ] (d) Widowed [ ] (e) Widower [ ]

4. What is your employment status (a) Unemployed [ ]

(b) Government employed [ ] (c) Private sector employed [ ]

(d) Self employed [ ] specifyé é é é (e) Retired/age at retirement [ ]é é é é é é é (f) Farming [ ] (g) house wife [ ] others (please specifyé é é é é é é é é .

5. What is your highest educational level? é é é é é ..

(a) No formal education [ ] (b) primary education [ ] (c) junior secondary [ ] (d)Senior secondary [ ]

(e) University/College/polythenic [ ] (f) post graduate education [ ]

SECTION B: ECONOMIC BURDEN OF DIABETES

DIRECT COSTS:

6. How long have you been receiving treatment or accompanying your relative for diabetes treatment in FMC Umuahia?.....

7. How often do you come for check up appointment?

(a) Weekly [ ] (b) 2 weekly [ ] (c) 4 weekly [ ]

(d) 6 weekly [ ] (e) 8 weekly [ ]

8. How much did it cost you to do all these tests before the doctor told you that you are suffering from Diabetes?....

(a).Random blood sugaré é é é (b).Fasting blood sugaré é é é é ..

(c). Urinalysisé é é é é (d). Oral glucose tolerance testé é é é é

(e). others please specifyé é é é é .

9. What is your monthly expenditure (ك. K) on the under listed areas for taking care of your diabetes treatment?

(a)Folder/Registration fee----------

(b) drugs (i) Insulin --------(ii) Tablets for diabetes ----

(iii) tablets given to prevent/delay diabetes complications like alpha diabetic ----------(iv) drugs for treatment of problems related to diabetes----------

(c)Laboratory tests (i) Fasting blood sugar --------- (ii) random Blood sugar--------- (iii) glycosolated haemoglobin é é é é é é

(iv) Fasting Lipid profile----------

(v) Other investigation related to diabetes: ECG ----------

Eye test------- Kidney testé é é é others specifyé é é é é ..

(d) Consultation fees (i) Physician --------- (ii) Other specialists----------

(e)Insurance premium and co-payment per visit----------

(f)Transport to and fro for you and person always accompanying you -----

(g)Diabetic diet per month----------

(h)Self monitoring of glucose levelsé é é é é é

(I)Insulin syringe and other disposables----------

(j)Extra household helper for diabetes care----------

(K) physiotherapy é é é é é é é é é é é é é

(L) dressings/disposablesé é é é é é é é é

10. Do you receive treatment for diabetes elsewhere within the last one year? Yes [ ] No [ ]

1= Yes 0 = No

11. If yes, please state the costs incurred for your treatment monthly in that place? .....

- What other disease did your Doctor tell you that you developed because of diabetes? é é é é é é é .
- How much does it cost you to take care of the condition monthly? é é é é é é é .

Indirect Costs:

14 What are your sources of income? ---------- ---------- ----

15. What is your monthly pay/earnings from these sources? ----------.. ----------

16. How many days have you been absent from work because of this sickness within the last one month? ----------

17. What is the employment status of the person that accompanies you for treatment regularly? --------

19. What are his/her monthly earnings? ---------- (get more information from accompanying person)

20. How long does it take you to see your doctor on each appointment date? .....

21. How many minutes does it take you to get to FMC Umuahia on appointment days? -------

22. Investigator collects data on premature retirement and premature death.

(age at retirement, income at retirement) loss earning years x income at retirement = cost of productivity lost)

SECTION C: PAYMENT STRATEGIES AND PAYMENT COPING MECHANISMS

Below is a list of possible sources of payment and assistance for you in diabetic care. I will read out to you some options, please indicate how often you use each option.

Very often=3 often =2 rarely=1 never =0

23. How have you been paying for the cost of your treatment? (A)paid (cash and carry) [ ] (b) cash and carry with reimbursement[ ](c)health insurance[ ](d) prepayment[ ] (e) deferred payment[ ] (f)exemption from payment[ ](g) install-mental payment[ ](h) in-kind

payment[ ](i) community based insurance (ñisusuò)[ ] (j) NGOS paid[ ] (k) others please specifyé é é

24. How have you been coping with payment for your diabetic treatment?

(A) own money(salary, earnings, savings) [ ] (b) borrowed money/loan[ ] (c)sale of household mobile assets[ ](d) sale of lands[ ] (e)community based support[ ] (f) gift from friends and neighbours[ ] (g) diabetic association paid[ ] (h) temporary stoppage of childrenôsô education[ ] (i) family member paid[ ]

(j) Social welfare/social worker (waiver)[ ] (k) do not seek treatment [ ] (l) Skips appointments [ ] (m) use alternative healthcare system[ ] (n) others please specifyé é ..

SECTION D: Respondents socio-economic status.

Household Assets holdings: Below are list of household assets, please indicate those owned by your family.

25. Does your family own any of the following? Yes [ ] No [ ] Yes=1 no=0

(a) Radio[ ] (b)television[ ] (c)Air conditioner[ ] (d) bicycle[ ] (e) Motorcycle[ ] (f) Car [ ] (g) fridge[ ] (h) generator [ ] (i) gas cooker [ ] (j) electric fan[ ] (k) Washing machine [ ] (l) micro wave oven [ ] (m) personal computer [ ]

RESPONDENTS' INCOME

26. How much do you earn from the following sources?

Sources	Period codes 1=daily 2=weekly 3=monthly	Amount receivable (ك)
Wages/salaries		
Farming/gardening		
Petty trading		
Small and medium scale enterprises		
Large scale enterprises		
Rent		
Pasturing		
Allowance from children/relations		
Security guards		
Housekeeping/housewifery		
Transport business		
Pension		
Others please specify		
Total		

RESPONDENTS EXPENDITURE

27. How much do you spend on the following items?

Items	Period codes 1=weekly 2=monthly	Amount spent(ك)	Add up later(annual expenditure)
(a)Food(purchased)			
(b)Food (produced by your family if it were bought how much will it cost).			
(c)clothing			
(d)rent			
(e)healthcare			
(f)cooking fuel			
(g)educational expenses			
(h)durable household goods specify			
(i)community welfare			
(j)transportation			
(k) others, please specify.			
Total			

28. How easy/difficult is it for you in paying for your diabetic management?

a. very easy [ ]

b. fairly easy [ ]

c. difficult [ ]

d. very difficult [ ]

29. Suggest ways you think you could be assisted to cope with the burden of diabetes and payment for healthcare?

THANK YOU.

FEDERAL MEDICAL CENTRE UMUAHIA

P.M.B. 7001, UMUAHIA, ABIA STATE, NIGERIA
email:fmcumuahia@fmcumuahia.com
fmcqeh@yahoo.com
website:www.fmcumuahia.com

Dr. Wakil Chibok, B.sc, M.sc, MBA, Phd.
Chairman, Management Board

Dr. Chuku Abali, MBBS, FWACS, FICS, Dip HSM, Cert HRM, OPTH MICRO SURG. FCIPSMN.
Medical Director

Ekpemu Rowland B.Sc, ACAI, MCIPM, AHAN.
Ag. Head of Administration/Secretary to the Board

Dr. Chukwuonye I. I. MBBS, FMCP
Chairman Medical Advisory Commttee.

HEALTH RESEARCH ETHICS COMMITTEE (HREC)

12th December, 2011

Notice of Full Approval after Full Committee Review

Protocol's full title including official abbreviations:

Economic burden, payment strategies and payment coping mechanisms of Diabetic patients attending a Tertiary Health Institution in Abia State South-East Nigeria.

Health Research Committee assigned Number:	FMC/QEH/G.596/Vol.4/006
Name of Principal Investigator:	**J.N. Ekpemiro**
Address of Principal Investigator:	**Dept. of Nursing Services** **Faculty: Health Science & Technology** **University: UNN**
Date of receipt of valid application:	**29th November, 2011**

Date of meeting when final determination of research was made: 12th December, 2011

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

This approval dates from 12th December, 2011 to 12th April, 2012. If there is delay in starting the research, please inform the HREC 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 date. *All informed consent forms used in this study must carry the HREC assigned number and duration of HREC approval of the study.* In multiyear research, endeavour to submit your annual report to the HREC early in order to obtain renewal of your approval and avoid disruption of your research.

The National Code for Health 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 HREC. No changes are permitted in the research without prior approval by the HREC except in circumstances outlined in the Code. The HREC reserved the right to conduct compliance visit to your research site without previous notification.

You are please required to donate a copy of this research work to the Health Research Ethics Committee of the Federal Medical Centre, Umuahia.

Thank you.

Dr I.O. Iwegbu
Chairman, HREC
For: Medical Director

Patient Informed Consent Form

Dear respondents,

You are being invited to participate in a study on the costs of diabetes and how diabetic patients /families cope with payment for treatment being conducted by a student of department of Nursing sciences, University of Nigeria Enugu Campus. The purpose of the study is to find out how much diabetes cost patients/their families, their sources of payment and how they cope with payment. It is hoped that the result will support advocacy positions on improving the quality care giving to diabetics through the implementation of the global guideline for diabetes management thus reduce frequency of hospital visits and length of hospitalization. It will also bring about governmental and non-governmental intervention and support to enforce policies and programmes to reduce the costs of diabetes.

You will be required to answer to a questionnaire on how much diabetes care costs you and how you have been coping with treatment in relation to other household expenditures. Every diabetic patient will be giving opportunity to participate. Your participation is voluntary. You are free to withdraw at any time or decline response to any question you find very sensitive without penalty. Your willingness to give honest answers to questions is required to make this study a success. An investigator will read out the questions and record your responses. If you are willing to participate we will proceed with the questions. Yes..... No.....

In case of any question or problem, please contact the chairman ethical and research committee FMC Umuahia, through the Chairman Medical Advisory Committee or the undersigned.

Thanks

Ekpemiro J .N

Principal investigator.

Department of Nursing Sciences

University of Nigeria, Enugu Campus.

0807720601.